

OBCE BOARD MEETING PUBLIC SESSION	May 19-20, 2022 8:00 AM
	Meeting location: OBCE office 530 Center St NE, Ste 620 Salem, OR 97301
	Zoom conference will also be available: https://us06web.zoom.us/j/81170413816?pwd=cIRRUTJaQmMrVE1ubUdKN1k4Y2tlZz09 Meeting ID: 811 7041 3816 Password: 402589
Board President: Franchesca Vermillion, DC Phone 503-378-5816 info@obce.oregon.gov	

Amended Agenda

May 19, 2022

8:00 AM Convene Public Session

8:00 AM Meet and Greet

1. PUBLIC COMMENTS

(Comments must be limited to 3-5 minutes. Notify the Board office in advance if you wish to address the Board.)

2. CONSENT AGENDA

Action

- a. Today's agenda
- b. March 31, 2022 Public Board Minutes

3. EXECUTIVE DIRECTOR REPORT

Inform/Action

4. OCA Update

Inform

5. UWS Update

Inform

6. 9:00 AM RULE HEARINGS

- a. **OAR 811-015-0025 Continuing Chiropractic Education** – Implementing CE reporting requirements, and to review BLS CE timeline and requirements. Inform

- b. **OAR 811-035-0015 Unprofessional Conduct in the Chiropractic Profession** – Review and add new section 27-29 regarding OHA rules and changing 'guidance' to 'rules'.

Inform

7. ADMINISTRATIVE RULES REVIEW and DISCUSSION

Action

- a. None

12:00 PM Working Lunch included

8. DISCUSSION AND ACTION ITEMS

- a. House Bill 2359 (2021) – Continued Discussion Inform/Action
- b. P&P Workgroup – Application Review Inform

9. CORRESPONDENCE

- a. DC via Facebook – public comment Inform/Action

10. WORK SESSION

- a. Finalization of the OCPUG Inform/Action
- b. Evidence Based Practices Manual Inform/Action

11. EXECUTIVE SESSION

The Board of Chiropractic Examiners will now go into Executive Session pursuant to ORS 192.660(2)(f), ORS 192.660(2)(l), ORS 192.660(2)(h), ORS 684.185, 676.175(1) and 684.100(10) concerning discipline, litigation, and exempt public records.

Representatives of the news media and designated staff will be allowed to attend the Executive Session. All other members of the audience are asked to leave the room. Representatives of the news media are specifically directed not to report on any of the deliberations during the Executive Session except to state the general subject of the session as previously announced.

No decision will be made in Executive Session. At the end of the Executive Session, we will return to open session and welcome the audience back into the room.

12. IN THE MATTERS OF (following Executive Session)

OBCE BOARD MEETING PUBLIC SESSION	March 31, 2022	8:30 AM
	Zoom Conference: Meeting ID: 896 2511 8713 Password: 457409	
Board President: Franchesca Vermillion, DC	Phone 503-378-5816	Fax 503-362-1260

Board member Attendees:	Staff Attendees:
Franchesca Vermillion DC, President	Cass McLeod-Skinner JD, Executive Director
Michelle Waggoner DC, Vice President	Mackenzie Purnell, Administrative Specialist II
Seth Alley DC, Secretary	Miriam Lara, Administrative Specialist II
Karen Baranick DC	Lori Lindley, Assistant Attorney General
Lori Schmidt JD, Public Member	Craig Kawaoka, DC, MeD, Healthcare Investigator
Glenn Taylor, Public Member	Heather Gilker, Office Specialist
Allen Knecht DC	
Public Attendees: Emily Coates, DC; Todd Turnbull, DC; Vern Saboe, DC; David Corll, DC; Sharron Fuchs, DC; Minga Guerrero, DC; Lisa Kouzes, DC; Daniel Cote, DC; Chelsea Morris; Chloe Johnson; Christian Mathisen.	

8:30 AM Convene Public Session

1. PUBLIC COMMENTS – No comments made.

2. CONSENT AGENDA

a. Today's agenda

Outcome: Approved.

b. January 20, 2022 Public Board Minutes

Outcome: Approved as amended.

3. EXECUTIVE DIRECTOR REPORT

Report was received by the Board.

4. OCA Update – Dr. Vern Saboe

OCA update was provided by Dr. Vern Saboe and received by the Board.

5. UWS Update

None.

6. 9:00 AM RULE HEARINGS

Action

a. OAR 811-015-0025 Continuing Chiropractic Education

Outcome:

Board approved edits; will bring back for discussion in May regarding Inlunon changes.

Vermillion moved to adopt as amended; Schmidt, second. Alley, aye; Knecht, aye; Schmidt, aye; Baranick, aye; Waggoner, aye; Vermillion, aye. Motion passed. Taylor unavailable.

b. OAR 811-015-0011 Minor Consent

Outcome:

Board approved edits and moves to create a permanent rule.

Vermillion moved to adopt as amended; Knecht, second. Schmidt, aye; Waggoner, aye; Baranick, aye; Alley, aye; Knecht, aye; Vermillion, aye. Motion passed. Taylor unavailable.

c. OAR 811-015-0023 BLS Certificate Requirement

Outcome:

Board voted against approving a permanent rule.

Vermillion moved to withdraw rule from OARD rulemaking; Taylor, second. Taylor, aye; Knecht, aye; Baranick, aye; Alley, aye; Waggoner, aye; Schmidt, aye; Vermillion, aye. Motion passed unanimously.

7. ADMINISTRATIVE RULES

a. OAR 811-010-0091 Compliance with the Oregon Health Authority's COVID-19 Requirements

Action

Outcome: No action, rule to lapse in May 2022.

Discussion:

Leave rule to expire and open unprofessional conduct rule, creating new section 28 regarding OHA rules.

b. OAR 811-010-0110 Chiropractic Assistants

Action

Outcome: No Board action.

c. OAR 811-035-0015 Unprofessional Conduct in the Chiropractic Profession

Action

Outcome:

Vermillion moved to enter rulemaking in May; Taylor, second. Taylor, aye; Waggoner, aye; Baranick, aye; Alley, aye; Knecht, aye; Schmidt, aye; Vermillion, aye. Motion passed unanimously.

Discussion:

Board did not include age of minor consent within the rule as it was not needed.
Board will review incorporating OSHA/OHA for possible new sections 28 and 29.

9. DISCUSSION AND ACTION ITEMS

a. 2022 Board Meeting locations

Action

Issue: Board meeting locations

Outcome:

- pushing strategic planning to January to include new board members
- Salem office in May
- Bend/Sunriver/Central Oregon in September
- Salem/Grand Hotel in January

- July and November via Zoom

b. 2023-25 Budget Projections and Fee Increases

Inform/Action

Issue: Increase in fees in 2023-25.

Outcome:

Board agreed on a 20% increase of all licensing fees/license types, effective January 1, 2023.

Vermillion moved to approve fee increases of 20%; Alley, second. Alley, aye; Taylor, aye; Knecht, aye; Schmidt, aye; Baranick, aye; Waggoner, aye; Vermillion, aye. Motion passed unanimously.

c. Proctology Rotation Proposal/Minor Surgery list discussion – Herschorn, L

Inform/Action

Outcome: No Board action.

d. False Advertising and Marketing Clarification – Turnbull, T (OCA President)

Inform/Action

Outcome: No Board action.

e. Powerpoll – Wet cupping responses

Inform/Action

Outcome: Received ETSDP application for this topic.

- No specific requirements, 5-7 members.
- Board liaison for committee: Dr. Alley

f. House Bill 2359 (2021) – Continued Discussion

Inform/Action

Issue: Healthcare provider requirements to provide ASL translators for patient access.

Outcome: Bring back to the May board meeting after OHA final rules are filed.

g. P&P Workgroup – Application Review

Action

Outcome: Deferred until May meeting.

10. CORRESPONDENCE

a. Public comments – OHA Mask Update

Inform

Outcome: No Board action.

a. Public comments – Guerrero, M

Inform

Outcome: No Board action.

11. WORK SESSION N/A

12. EXECUTIVE SESSION

13. IN THE MATTERS OF (following Executive Session)

Case # 2020-1031

Proposal: No Statutory Violation

Motion: Schmidt moved to accept the proposal; Vermillion, second.

Vote: Taylor, aye; Waggoner, aye; Baranick, aye; Schmidt, aye; Knecht, aye; Alley, aye; Vermillion, aye. Motion passed.

Case # 2021-1026

Proposal: Insufficient Evidence with a letter of concern regarding appropriate patient communication and record keeping.

Motion: Alley moved to accept the proposal; Knecht, second.

Vote: Taylor, aye; Waggoner, aye; Baranick, aye; Schmidt, aye; Knecht, aye; Alley, aye; Vermillion, aye. Motion passed.

5:30 PM Adjourn for the Day

Prepared by Mackenzie Purnell, Administrative Specialist 2; 4/21/2022

Board and Commission Meeting Minutes Series documents the official proceedings of the board or commission meetings. Records may include agendas; minutes; meeting notices; items for board action; contested case hearings schedules; committee reports; exhibits; and related correspondence and documentation. Records may also include audio recordings of meetings used to prepare summaries. Retention: (a) Minutes: Permanent, transfer to State Archives after 10 years; (b) Audio recordings: 1 year after transcribed, destroy; (c) Other records: 5 years, destroy.

Executive Staff Report
May 19-20, 2022 Board meeting

To: Board of Chiropractic Examiners
From: Cass McLeod-Skinner, Executive Director

Board Meeting details: **May 19-20, 2022**
OBCE Salem Office
530 Center St NE, Suite 620
Salem, OR 97301

2021-23 Budget

As of the close of March, we have an estimated ending cash balance of \$351,194.77 which translates to 4.15 months of expenditure reserve. This cash balance does not yet reflect the \$150,000 case settlement received in March.

2023-25 Legislative Concept – Minor Consent

I have a meeting the week of May 16 with DAS Legislative staff to review our proposed legislative concept and next steps.

OBCE Investigator Gina Sullivan

Welcome to the OBCE, Gina! Gina comes to us with almost 5 years of state investigation experience and a passion for keeping vulnerable people safe. We look forward to our years ahead with her!

Current Licensee Statistics

Licensee Types	06/21	07/21	08/21	09/21	10/21	11/21	12/21	01/22	02/22	03/22	04/22	05/22
DC - Active	1224	1223	1230	1234	1235	1234	1229	1222	1221	1217	1206	1224
DC - Inactive	193	190	195	200	205	224	219	222	248	252	256	248
DC - Senior	414	415	415	416	416	418	412	413	411	414	423	445
DC - Initial	76	80	78	74	75	79	74	76	78	77	75	71
DC Total	1907	1908	1918	1924	1931	1955	1934	1933	1958	1960	1960	1988
CA - Initial	346	345	316	332	352	360	376	377	395	407	419	434
CA - Renewing	994	986	989	980	985	966	966	973	971	978	982	986
CA Total	1340	1332	1305	1312	1337	1326	1342	1350	1366	1385	1401	1420
TOTAL	3247	3240	3223	3236	3268	3281	3276	3283	3324	3345	3361	3408

* Includes Senior and Initial DCs.

2022 Board Meeting Dates and Locations

July 21, 2022 (Thursday) - Virtual

September 21-22, 2022 (Wednesday/Thursday) - Central Oregon TBD

November 17, 2022 (Thursday) - Virtual

AGENCY 811 - Board of Chiropractic Examiners

2021-23 Budget to Actuals Summary Report

OPERATING OTHER FUNDS		Legislatively Adopted Budget (LAB)	2021-23 Revenue & Expenditures		Projections	Difference between LAB Budget and Projections
\$	2,146,466.00		Actuals as of Month End	% Earned/Spent		
Beginning Balance:						
AY Beginning Balance		\$ 395,755	\$ 600,248	N/A		N/A
Revenue:						
Revenue less Transfers out		\$ 2,006,536	\$ 1,015,998	51%	\$ 2,741,791	\$ (735,255)
Expenditures:						
Personal Services	\$ 1,226,396	\$ 338,653	28%	\$ 1,116,298	\$ 110,098	
Services and Supplies	\$ 947,114	\$ 307,828	33%	\$ 915,767	\$ 31,347	
Special Payments	\$ -	\$ -	0%	\$ -	\$ -	
Total Expenditures	\$ 2,173,510	\$ 646,480	30%	\$ 2,032,065	\$ 141,445	
Adjust for Accrued Accounts Receivable		\$ (358,531)		\$ (358,531)		
Net Ending Cash	\$ 228,781	\$ 611,233		Net Position	\$ 709,726	
				(Projected AY Ending Cash)	Within Budget	
Outstanding AR owed to agy					(358,531.28)	
Projected ending cash					\$ 351,194.77	
Working Cap					4.15 Months	

BOARD OF CHIROPRACTIC EXAMINERS
2021-23 CASH FLOW

2021-23 CASH FLOW	Actuals Highlighted																												ACTUALS BIENNIAL TO DATE	ACTUALS + PROJECTIONS	AY23 LAB	PROJECTION TO FIN PLAN (over/under)
	2021 JUL Actuals	2021 AUG Actuals	2021 SEP Actuals	2021 OCT Actuals	2021 NOV Actuals	2021 DEC Actuals	2022 JAN Actuals	2022 FEB Actuals	2022 MAR Actuals	2022 APR Projections	2022 MAY Projections	2022 JUN Projections	2022 Mo. 13 Projections	2022 JUL Projections	2022 AUG Projections	2022 SEP Projections	2022 OCT Projections	2022 NOV Projections	2022 DEC Projections	2023 JAN Projections	2023 FEB Projections	2023 MAR Projections	2023 APR Projections	2023 MAY Projections	2023 JUN Projections	2023 Mo. 13 Projections						
Beginning Cash Balance	600,247.54	601,112.36	628,512.60	540,971.91	560,322.31	564,323.56	555,668.18	567,144.61	545,419.15	569,764.56	553,202.12	561,538.33	559,610.43	537,327.01	827,865.12	816,222.16	810,510.96	806,452.87	795,036.61	786,387.46	775,626.93	765,078.43	758,198.80	753,869.67	734,421.52	729,842.53	707,559.11	969,764.56	709,726.05	228,781.00		
REVENUE																																
0205 OTHER BUSINESS LICENSES	2,400.00	975.00	450.00	3,292.00	700.00	1,250.00	3,275.00	1,500.00	1,075.00	1,657.44	1,657.44	1,657.44	1,657.44	1,657.44	1,657.44	1,657.44	1,657.44	1,657.44	1,657.44	1,657.44	1,657.44	1,657.44	1,657.44	1,657.44	1,657.44	1,657.44	1,657.44	1,657.44	1,657.44	1,657.44		
0210 OTHER NONBUSINESS LIC & FEES	57,907.50	75,140.25	65,396.25	70,866.50	60,801.25	61,050.75	79,021.25	55,448.75	75,887.50	72,000.00	72,000.00	72,000.00	-	72,000.00	72,000.00	72,000.00	72,000.00	72,000.00	72,000.00	72,000.00	72,000.00	72,000.00	72,000.00	72,000.00	72,000.00	72,000.00	72,000.00	72,000.00	72,000.00	72,000.00		
0410 CHARGES FOR SERVICES	10.00	10.00	325.00	5.00	120.00	20.00	200.01	10.00	200.01	87.50	87.50	87.50	87.50	87.50	87.50	87.50	87.50	87.50	87.50	87.50	87.50	87.50	87.50	87.50	87.50	87.50	87.50	87.50	87.50	87.50	87.50	
0505 FINES AND FORFEITS	600.00	850.00	100.00	100.00	1,600.00	391,812.50	(3,000.00)	400.00	2,600.00	725.00	725.00	725.00	-	725.00	725.00	725.00	725.00	725.00	725.00	725.00	725.00	725.00	725.00	725.00	725.00	725.00	725.00	725.00	725.00	725.00	725.00	
0705 OTHER SALES INCOME	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
0975 OTHER REVENUE	404.00	466.00	430.00	418.00	366.00	368.00	502.00	358.00	486.00	422.00	422.00	422.00	422.00	422.00	422.00	422.00	422.00	422.00	422.00	422.00	422.00	422.00	422.00	422.00	422.00	422.00	422.00	422.00	422.00	422.00		
TOTAL REVENUE	61,321.50	77,441.25	66,701.25	74,681.50	63,587.25	454,501.25	79,398.26	57,716.75	80,048.50	74,891.95	74,891.95	74,891.95	-	74,891.95	74,891.95	74,891.95	74,891.95	74,891.95	74,891.95	74,891.95	74,891.95	74,891.95	74,891.95	74,891.95	74,891.95	74,891.95	74,891.95	74,891.95	74,891.95	74,891.95		
REVENUE TRANSFER OUT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2443 TRANSFER OUT TO OHA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
TOTAL TRANSFERS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
AVAILABLE REVENUE	61,321.50	77,441.25	66,701.25	74,681.50	63,587.25	454,501.25	79,398.26	57,716.75	80,048.50	69,091.95	74,891.95	74,891.95	-	74,891.95	74,891.95	74,891.95	74,891.95	74,891.95	74,891.95	74,891.95	74,891.95	74,891.95	74,891.95	74,891.95	74,891.95	74,891.95	74,891.95	74,891.95	74,891.95	74,891.95	74,891.95	
PERSONAL SERVICES										Skinner Jan, Feb, Mar																						
3110 CLASS/UNCLASS SALARY	26,533.60	17,139.54	17,449.77	19,857.61	24,623.77	28,197.24	16,613.46	28,148.28	25,564.90	31,284.66	13,386.65	29,919.92	-	29,919.92	33,319.92	33,489.32	31,289.32	31,689.32	34,229.00	34,796.00	31,596.00	33,796.00	31,596.00	34,396.00	31,596.00	31,596.00	31,596.00	31,596.00	31,596.00	31,596.00	31,596.00	
3160 TEMPORARY APPOINTMENTS	-	-	-	723.93	2,004.10	2,291.60	2,022.00	2,182.08	2,367.43	2,190.00	2,341.11	2,341.11	-	2,341.11	2,341.11	2,341.11	2,341.11	2,341.11	2,414.00	2,414.00	2,414.00	2,414.00	2,414.00	2,414.00	2,414.00	2,414.00	2,414.00	2,414.00	2,414.00	2,414.00	2,414.00	
3170 OVERTIME PAYMENTS	2,003.67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
3180 SHIFT DIFFERENTIAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
3190 ALL OTHER DIFFERENTIAL	980.10	980.10	235.08	889.19	1,323.55	1,354.22	534.76	7,165.95	1,108.96	913.05	913.05	913.05	-	913.05	913.05	931.52	931.52	931.52	960.40	960.40	960.40	960.40	960.40	960.40	960.40	960.40	960.40	960.40	960.40	960.40	960.40	
3210 ERB ASSESSMENT	7.20	4.80	7.20	9.60	9.60	9.60	9.60	9.60	9.60	12.00	12.00	12.00	-	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	
3220 PUBLIC EMPLOYEES' RETIREMT	5,561.71	3,132.89	1,620.69	2,340.09	3,170.11	3,252.18	1,321.30	4,287.13	3,302.21	5,327.41	5,669.13	5,669.13	-	5,669.13	5,669.13	5,733.00	5,733.00	5,733.00	5,910.90	5,974.35	5,974.35	5,974.35	5,974.35	5,974.35	5,974.35	5,974.35	5,974.35	5,974.35	5,974.35	5,974.35	5,974.35	
3221 PENSION BOND CONTRIBUTION	1,652.96	1,014.69	524.91	757.92	1,026.75	1,053.33	427.93	1,386.54	1,069.54	1,725.48	1,836.15	1,836.15	-	1,836.15	1,836.15	1,856.84	1,856.84	1,856.84	1,914.46	1,935.01	1,935.01	1,935.01	1,935.01	1,935.01	1,935.01	1,935.01	1,935.01	1,935.01	1,935.01	1,935.01	1,935.01	
3230 SOCIAL SECURITY TAX	2,249.36	1,369.79	1,337.68	-	1,626.58	2,416.50	1,453.10	2,845.15	2,196.34	2,601.16	2,722.52	2,508.32	-	2,508.32	2,768.42	2,781.38	2,613.08	2,643.68	2,844.79	2,888.17	2,643.37	2,643.37	2,643.37	2,643.37	2,643.37	2,643.37	2,643.37	2,643.37	2,643.37	2,643.37	2,643.37	
3240 UNEMPLOYMENT ASSESSMENT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
3250 WORKERS' COMPENSATION	4.99	5.22	4.06	6.43	7.87	8.83	6.15	7.65	8.59	11.46	11.46	11.46	-	11.46	11.46	11.46	11.46	11.46	11.46	11.46	11.46	11.46	11.46	11.46	11.46	11.46	11.46	11.46	11.46	11.46	11.46	
3260 MASS TRANSIT	177.09	108.71	66.80	131.42	165.28	170.64	108.02	208.12	174.22	205.38	203.17	193.57	-	193.57	203.17	205.38	200.58	203.17	213.66	213.66	204.06	204.06	204.06	204.06	204.06	204.06	204.06	204.06	204.06	204.06	204.06	
3270 FLEXIBLE BENEFITS	5,246.30	5,246.30	4,159.71	4,965.21	5,897.69	6,155.89	4,744.58	6,987.91	6,987.91	6,743.88	6,743.88	6,743.88	-	6,743.88	6,743.88	6,743.88	6,743.88	6,743.88	6,973.17	6,973.17	6,973.17	6,973.17	6,973.17	6,973.17	6,973.17	6,973.17	6,973.17	6,973.17	6,973.17	6,973.17	6,973.17	
3455 VACANCY SAVINGS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
3465 RECONCILIATION ADJUST	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
TOTAL PERSONAL SERVICES	44,416.98	29																														

811-015-0025

Continuing Chiropractic Education

(1) Continuing chiropractic education (CE) is to improve the competence and skills of Oregon chiropractic licensees, and to help assure the Oregon public of the continued competence of these licensees within the statutory scope of practice.

(2) In order to renew a license or certificate, each licensee shall complete an affidavit attesting to successful completion of education per their license or certificate status.

(a) Chiropractic physician first year initial status – 8 hours which must include the following:

(A) Over-the-counter, non-prescriptive substances – 4 hours;

(B) Evidence-based medicine – 2 hours;

(C) Cultural competency – 1 hour;

(D) Suicide intervention training – 1 hour;

(b) Chiropractic physician second year active status – 20 hours which must include the following:

(A) Pain Management Education – 7 hours (6 accredited hours in pain management, palliative care, and end of life care or a combination of both, and 1 hour of pain management module through the Pain Management Commission);

(B) Cultural competency – 2 hours;

(C) Suicide intervention training – 1 hour;

(D) General continuing education, including BLS/CPR/AED – 10 hours;

(c) Chiropractic physician active status - 20 hours which must include the following:

(A) Cultural competency – 2 hours;

(B) Suicide intervention training – 1 hour;

(C) General continuing education, including BLS/CPR/AED – 17 hours;

(d) Chiropractic physician senior active status - 6 hours;

(A) Cultural competency – 1 hour;

(B) Suicide intervention training – 1 hour;

(C) General continuing education, including BLS/CPR/AED – 4 hours;

(e) Chiropractic assistant - 6 hours which must include the following:

(A) Cultural competency – 1 hour;

(B) General continuing education, including BLS/CPR/AED – 5 hours.

(f) The Board may require additional specific courses as part of a licensee's annual renewal hours for an upcoming license or certificate period.

(3) Continuing education course or activity hours must be completed during the preceding license or certification period. A licensee may not claim more than 20 hours of continuing education completed in one 24-hour period. Courses shall not be taken simultaneously. Each licensee shall maintain records to support the attestation of completed hours.

(4) Courses or activities determined by licensees to meet the criteria herein are presumed to be approved until or unless specifically disapproved by the Board. Licensees will be informed of any disapproved courses in a timely manner. The Board will maintain a list of disapproved courses available for review by licensees.

(5) Any chiropractic physician who is also actively licensed in a healthcare profession with prescriptive rights is exempt from the over-the-counter, non-prescriptive substances requirements.

(6) Any chiropractic physician changing license status from inactive to active or senior active shall take the required hours referenced in section (2). It shall be within the Board's discretion to determine, on a case-by-case basis, the required continuing education based on the time away from active status.

(7) Approved continuing chiropractic education shall be obtained from courses or activities which meet the following criteria:

(a) They do not misrepresent or mislead;

(b) They are presented by a chiropractic physician, licensed here or in another state, other appropriate health care provider, or other qualified person;

(c) They exclude practice-building subjects and the primary purpose of the program may not be to sell or promote a commercial product. However, the mere mention of practice-building concepts shall not disqualify a program's eligibility for CE credit.

(d) The material covered shall pertain to the practice of chiropractic in Oregon or be related to the licensee's specific practice;

(e) Continuing education hours for Board activities must assist in assuring the competence and skills of the licensee; and

(f) Shall be quality courses or activities adequately supported by evidence or rationale as determined by the Board.

(8) The Board may accept a maximum of 6 credit hours from each of the following categories:

(a) Being an original author of an article, published in a peer reviewed journal, given in the year of publication;

(b) Participation in a formal protocol writing process associated with an accredited health care institution or state or government health care agency;

(c) Participation as an OBCE board member or on an OBCE committee;

(d) Participation on a National Board of Chiropractic Examiners' (NBCE) examination or test writing committee;

(e) Participation in a research project, approved by the Board, related to chiropractic health care directed by an educational institution or other qualified chiropractic organization;

(f) Teaching courses at an accredited health care institution;

(g) Teaching chiropractic continuing education courses;

(h) Professionally licensed staff of the OBCE; and

(i) Professionally licensed non-board member attending public OBCE board meetings. Each meeting, the attendee will be given a maximum of 2 hours.

(9) The Board may accept credit hours from courses, seminars, or other activities. Completion of other activities as chiropractic continuing education is defined as follows:

- (a) Continuing medical education (CME);
- (b) Video or pre-recorded continuing education courses or seminars, unless specifically required by the Board to be taken in person;
- (c) Successful completion of online or in-person college courses related to chiropractic health care taught at an educational institution; and

(d) CPR/BLS/AED courses.

(10) All licensees are required to keep full, accurate, and complete records:

(a) A verification of attendance for all CE courses or activities showing hours claimed for renewal credit, and or proof of completion signed by the sponsor and licensee.

(b) Video or pre-recorded courses shall be supported through record-keeping with a letter, memo, or on a form provided by the Board, that includes the dates and times, vendor's or presenter's name/s, total hours claimed for each course, location, and includes the following statement: "I swear or affirm that I viewed or listened to these continuing education courses in their entirety on the dates and times specified in this report."

(c) A copy of a published article including the date of publication;

(d) A written record of hours in clinical protocol development and research projects. The record shall include the names and addresses of the institutions involved, name of supervisors, and their signatures verifying hours.

(e) For licensees claiming CE hours under the provisions of (8)(d), for participation on a Board committee, or assisting with a National Board of Chiropractic Examiners' (NBCE) examination or NBCE test writing committee, certification from the Board or NBCE.

(f) For licensees claiming CE hours under the provisions of (8)(f), a record of employment by health care institutions, signed by their supervisor, a copy of the course syllabus if applicable, and verification of hours.

(g) For licensees claiming CE hours under the provisions of (8)(g), licensee shall obtain and keep verification of the course taught including, the dates of the course, a syllabus and the sponsoring organization.

(11) The Board will generate a random computer list of a minimum of 10% or up to 100% of renewing licensees, who will have their CE records audited and reviewed to ensure compliance with this rule. Licensees shall respond to this request within 30 days by supplying the Board with verification of their CE courses or activities.

(12) Any licensee who has submitted inadequate, insufficient, or deficient CE records or who otherwise appears to be in noncompliance with the requirements of this rule will be given written notice by the Board and will have 30 days from the date of notice to submit additional documentation, information or written explanation to the Board establishing the licensee's compliance with this rule. The Board may issue civil citations for noncompliance of this rule.

(13) At its discretion, the Board may audit, by attendance, the content of any program in order to verify the content thereof. Denial of an audit is grounds for disapproval.

(14) Any licensee seeking a hardship waiver from their continuing education requirements shall apply to the Board, in writing, as soon as possible after the hardship is identified and prior to the close of licensure for that year. Specific details of the hardship must be included. In order to approve an application for a hardship waiver, the Board, within its discretion, must find that such hardship exists.

(15) The Board shall maintain and make available, through its web page and electronic communications to licensees, a list of disapproved courses, if any. The Board may disapprove a course or CE activity after giving the sponsor and/or licensees the opportunity to provide additional information of compliance with the criteria contained in this rule, and opportunity for contested case hearing under the provisions of ORS 183.341, if requested. Any CE sponsor or licensee may request the Board to review any previously disapproved course at any time.

Statutory/Other Authority: ORS 684.155

Statutes/Other Implemented: ORS 684.092

811-035-0015**Unprofessional Conduct in the Chiropractic Profession**

Unprofessional conduct means any unethical, deceptive, or deleterious conduct or practice harmful to the public; any departure from, or failure to conform to, the minimal standards of acceptable chiropractic practice; or a willful or careless disregard for the health, welfare, or safety of patients, in any of which cases proof of actual injury need not be established. Unprofessional conduct shall include, but not be limited to, the following acts of a chiropractic physician:

- (1) Conduct that is prohibited as described in OAR 811-035-0019 Sexual Unprofessional or Dishonorable Conduct;
- (2) Charging fees for unnecessary services;
- (3) Failing to teach and/or directly supervise persons to whom chiropractic services have been delegated;
- (4) Practicing outside the scope of the practice of chiropractic in Oregon;
- (5) Charging a patient for services not rendered;
- (6) Intentionally causing physical or emotional injury to a patient;
- (7) Directly or indirectly engaging in threatening, dishonest, or misleading fee collection techniques;
- (8) Soliciting or borrowing money from patients;
- (9) Receiving a conviction of a crime for possessing, obtaining, attempting to obtain, furnishing, or prescribing controlled drugs to any person, including self, except as directed by a person authorized by law to prescribe drugs; illegally using or dispensing controlled drugs;
- (10) Aiding, abetting, or assisting an individual to violate any law, rule, or regulation intended to guide the conduct of chiropractic physicians or other health care providers;
- (11) Violating the rights of privacy or confidentiality of the patient unless required by law to disclose such information;
- (12) Perpetrating fraud upon patients or third party payors, relating to the practice of chiropractic;
- (13) Using any controlled or illegal substance or intoxicating liquor to the extent that such use impacts the ability to safely conduct the practice of chiropractic;
- (14) Practicing chiropractic without a current Oregon license;
- (15) Allowing another person to use one's chiropractic license for any purpose;

- (16) Resorting to fraud, misrepresentation, or deceit in applying for or taking the licensure exam or obtaining a license or renewal thereof;
- (17) Impersonating any applicant or acting as a proxy for the applicant in any chiropractic licensure examination;
- (18) Disclosing the contents of the licensure examination or soliciting, accepting, distributing, or compiling information regarding the contents of the examination before, during, or after its administration; Notwithstanding this section, the Ethics and Jurisprudence Examination is open book and there is no restriction on applicants discussing answers to individual questions between themselves or with others;
- (19) Failing to keep complete, accurate, and minimally competent records on all patients;
- (20) Failing to provide the Board with any documents requested by the Board;
- (21) Failing to fully cooperate with the Board during the course of an investigation, including but not limited to, waiver of confidentiality privileges, except attorney-client privilege;
- (22) Failing to answer truthfully and completely any question asked by the Board on an application for licensure or certification, or during the course of an investigation, or any other question asked by the Board;
- (23) Failing to comply with state and federal laws regarding child and elderly abuse, and communicable diseases;
- (24) Failing to provide and maintain a safe and sanitary treatment environment;
- (25) Claiming any academic degree or certification, not actually conferred or awarded;
- (26) Disobeying a final order of the Board;
- (27) During a declared emergency, unprofessional conduct includes failing to comply with any applicable provision of a Governor's Executive Order or any provision of this rule.
 - (a) Failing to comply as described in subsection (27) includes, but is not limited to:
 - (A) Operating a chiropractic entity required to be closed by a current Executive Order;
 - (B) Providing chiropractic services at a business required to be closed by a current Executive Order;
 - (C) Failing to comply with applicable Oregon Health Authority (OHA) guidance implementing a current Executive Order; and
 - (D) Failing to comply with any OBCE guidance or rule implementing an Executive Order.

(b) No disciplinary action or penalty action shall be taken under this rule if the Executive Order alleged to have been violated is not in effect at the time of the alleged violation.

(28) Failing to comply with Oregon Health Authority's (OHA) applicable rules;

(29) Failing to comply with Oregon Occupational Safety and Health Administration's (OSHA) applicable rules;

(30) Fee splitting means compensation by or to a chiropractic physician or chiropractic clinic solely for referral of a patient.

(a) Chiropractic physicians may not refer patients based on whether the referring chiropractic physician has negotiated a discount for specialty services. Chiropractic physicians may not accept:

(A) Any compensation of any kind, from any source for referring a patient other than distributions of a health care organization's revenues as permitted by law.

(B) Compensation for services relating to the care of a patient from any health care facility/organization to which the physician has referred the patient.

(C) Compensation for referring a patient to a research study with the exception of remuneration for administrative costs.

(b) Compensation is defined as something given or received as payment including but not limited to: bartering, tips, money, donations, goods, or services.

(31) Making an agreement with a patient or person, or any person or entity representing patients or persons, or provide any form of consideration that would prohibit, restrict, discourage or otherwise limit a person's ability to file a complaint with the Board, to truthfully and fully answer any questions posed by an agent or representative of the Board regarding a board proceeding, or to participate as a witness in a Board proceeding;

(32) It shall be considered unprofessional conduct for a licensee to own or operate a clinic or practice as a surrogate for, or be employed by, an individual or entity who could otherwise not own and/or operate a chiropractic clinic under OAR 811-010-0120; and

(33) Chiropractic physicians holding an ownership interest as described in OAR 811-010-0120 may be held responsible, entirely or in part, for staff who provide patient services. This includes a responsibility to render adequate supervision, management, and training of staff or other persons including, but not limited to, chiropractic physicians, student interns, chiropractic assistants and/or others practicing under the licensee's supervision. Chiropractic physicians with staff may be held responsible, entirely or in part, for undue influence on staff or a restriction of an associated chiropractic physician from using their own clinical judgment.

Statutory/Other Authority: ORS 684.155

Statutes/Other Implemented: ORS 684

PURNELL Mackenzie G * BCE

From: PURNELL Mackenzie G * BCE
Sent: Thursday, April 28, 2022 6:47 AM
To: PURNELL Mackenzie G * BCE
Subject: OCA Letter to OBCE relative to OHA Admin Rule
Attachments: Masks^J 150 Comparative Studies^J Masks Do Not Work^J Jan. 21^J 2022.docx; Masks, Lung Study Accumulation of Microplastics in the Lungs, Polypropylene, Not a Mask Study, Potential Masks are Made of this.pdf; Covid Vaccines, 45 Studies Suggest They Are Not Working, April 3, 2022.docx; OBCE Evidence on Natural Immunity Following Recovery from COVID Infection, March 31, 2022.docx; Supression of Science, BMJ Nov. 13, Editorial, 2020.pdf; 2022= Proposed unprofessional conduct OAR 811-035-0015-- rebuttal letter from OCA.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

From: Jan Ferrante [REDACTED]
Sent: Monday, April 25, 2022 10:51 AM
To: MCLEOD-SKINNER Cass * BCE <Cass.MCLEOD-SKINNER@obce.oregon.gov>
Subject: Fwd: OCA Letter to OBCE relative to OHA Admin Rule

Dear Ms. McLeod-Skinner::

Attached please find a letter from the OCA and signed by Dr. Todd Turnbull, President, regarding the Proposed OAR 811-035-0015 : Unprofessional Conduct in the Chiropractic Profession (this is the last attachment) and also attached are several exhibits supporting this letter.

If you have any questions please let me know. Also, please confirm the receipt of the letter and the additional exhibits.

Regards,

JAN

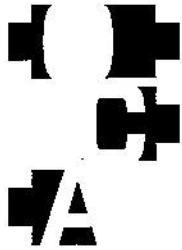
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Jan Ferrante, Executive Director
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April 22, 2022

Cassandra C. McLeod-Skinner, JD

Executive Director

Oregon Board of Chiropractic Examiners

530 Center Street NE, Suite 620

Salem, Oregon 97301

RE: Proposed OAR 811-035-0015 Unprofessional Conduct in the Chiropractic Profession. ***“(27) During a declared emergency unprofessional conduct includes failing to comply with any applicable provision of a Governor’s Executive Order or any provision of this rule.”***

Dear Ms. Skinner,

Ensuring patient/public safety is of the highest priority of the Oregon Chiropractic Association and the primary charge of the Oregon Board of Chiropractic Examiners.

We respectfully submit with public safety as our mutual goal, any executive order, public health guidance or recommendation from the Governor, Oregon Health Authority, or OBCE, should be supported by high quality evidence where available, if lacking, the preponderance of medical evidence should be relied upon.

Currently the above is not the case for example, the executive order requiring continued masking in our chiropractic practices is not supported by the preponderance of scientific evidence accumulated over the last 19 months (attached). In addition to revealing no compelling evidence masks (including N-95) prevent viral spread, there are a number of documented detrimental effects to wearing masks all day. The OCA reported months ago, reports of dangerous toxic mold, fungi, and bacteria that accumulate on masks. Additionally, masking reduces blood oxygen levels shown to suppress T-cell production, an important portion of our immune response to viral infection. Increased carbon dioxide levels can result in headaches, heart palpitations, dizziness, and syncope, as well as cross contamination when the mask wearer continually touches and adjusts their mask and increased viral concentration in the nasal passages.

Recently, the potential danger of the chlorine, polyester, and microplastic components of face masks has become a concern. In a 2022 British publication (attached), the investigators focused on polypropylene, a component of face masks. This was **not** a study about masks, however, since medical masks can contain polypropylene, the potential of clinicians and patients inhaling microplastics and their accumulation in the lung is an understandable concern. The continued executive order requiring

TOGETHER WE ARE ALIGNED

continued use of masks in our practices is but one example. The effectiveness and safety of the Covid vaccines is another example wherein there is a large and growing body of scientific evidence suggesting these injections are neither effective nor safe for some individuals and the benefit vs. risk does not favor taking the vaccines vs. relying on natural immunity (attached).

It is the position of the OCA that "politics" has no place in creating good public health policy, however this has been allowed in our wonderful state. Learned principled debate and honest discourse is being discouraged with attempts to silence critical voices with additional measures aimed at harming those individuals personally and professionally. When principled debate is discouraged, we hinder our ability to know the truth, and in so doing, jeopardize public safety.

To quote Kamran Abbasi, executive editor, British Medical Journal (attached).

"Science is being suppressed for political and financial gain. Covid-19 has unleashed state corruption on a grand scale, and it is harmful to public health. Politicians and Industry are responsible for this opportunistic embezzlement. So too are scientists and health experts. The pandemic has revealed how the medical-political complex can be manipulated in an emergency – a time when it is even more important to safeguard science."

Ensuring the safety of our patients is of the highest priority of the Oregon Chiropractic Association. The OCA respectfully asks that the OBCE convene regular bi-monthly Covid meetings with OCA officials to discuss Covid issues and concerns as well as the science related to those issues. The goal being to ensure public safety.

Sincerely,



Todd A. Turnbull, DC, CCSP

President

Oregon Chiropractic Association

Evidence Suggesting a Lack of Effectiveness of COVID-19 Vaccines

- 1) [Gazit et al.](#) out of Israel showed that “SARS-CoV-2-naïve vaccinees had a 13-fold (95% CI, 8-21) increased risk for breakthrough infection with the Delta variant compared to those previously infected.” When adjusting for the time of disease/vaccine, there was a 27-fold increased risk (95% CI, 13-57).
- 2) Ignoring the risk of infection, given that someone was infected, [Acharya et al.](#) found “no significant difference in cycle threshold values between vaccinated and unvaccinated, asymptomatic and symptomatic groups infected with SARS-CoV-2 Delta.”
- 3) [Riemersma et al.](#) found “no difference in viral loads when comparing unvaccinated individuals to those who have vaccine “breakthrough” infections. Furthermore, individuals with vaccine breakthrough infections frequently test positive with viral loads consistent with the ability to shed infectious viruses.” Results indicate that “if vaccinated individuals become infected with the delta variant, they may be sources of SARS-CoV-2 transmission to others.” They reported “low Ct values (<25) in 212 of 310 fully vaccinated (68%) and 246 of 389 (63%) unvaccinated individuals. Testing a subset of these low-Ct samples revealed infectious SARS-CoV-2 in 15 of 17 specimens (88%) from unvaccinated individuals and 37 of 39 (95%) from vaccinated people.”
- 4) In a study from Qatar, [Chemaitelly et al.](#) reported vaccine efficacy (Pfizer) against severe and fatal disease, with efficacy in the 85-95% range at least until 24 weeks after the second dose. As a contrast, the efficacy against infection waned down to around 30% at 15-19 weeks after the second dose.
- 5) From Wisconsin, [Riemersma et al.](#) reported that vaccinated individuals who get infected with the Delta variant can transmit SARS-CoV-2 to others. They found an elevated viral load in the unvaccinated and vaccinated symptomatic persons (68% and 69% respectively, 158/232 and 156/225). Moreover, in the asymptomatic persons, they uncovered elevated viral loads (29% and 82% respectively) in the unvaccinated and the vaccinated respectively. This suggests that the vaccinated can be infected, harbor, cultivate, and transmit the virus readily and unknowingly.

6) [Subramanian](#) reported that “at the country-level, there appears to be no discernable relationship between percentage of population fully vaccinated and new COVID-19 cases.” When comparing 2947 counties in the United States, there were slightly less cases in more vaccinated locations. In other words, there is no clear discernable relationship .

7) [Chau et al.](#) looked at transmission of SARS-CoV-2 Delta variant among vaccinated healthcare workers in Vietnams. Of 69 healthcare workers that tested positive for SARS-CoV-2, 62 participated in the clinical study, all of whom recovered. For 23 of them, complete-genome sequences were obtained, and all belonged to the Delta variant. “Viral loads of breakthrough Delta variant infection cases were 251 times higher than those of cases infected with old strains detected between March-April 2020”.

8) In Barnstable, Massachusetts, [Brown et al](#) found that among 469 cases of COVID-19, 74% were fully vaccinated, and that “the vaccinated had on average more virus in their nose than the unvaccinated who were infected.”

9) Reporting on a [nosocomial hospital outbreak](#) in Finland, Hetemäli et al. observed that “both symptomatic and asymptomatic infections were found among vaccinated health care workers, and secondary transmission occurred from those with symptomatic infections despite use of personal protective equipment.”

10) In a [hospital outbreak](#) investigation in Israel, Shitrit et al. observed “high transmissibility of the SARS-CoV-2 Delta variant among twice vaccinated and masked individuals.” They added that “this suggests some waning of immunity, albeit still providing protection for individuals without comorbidities.”

11) In the [UK COVID-19 vaccine Surveillance Report for week #42](#), it was noted that there is “waning of the N antibody response over time” and “that N antibody levels appear to be lower in individuals who acquire infection following 2 doses of vaccination.” The same report (Table 2, page 13), shows the in the older age groups above 30, the double vaccinated persons have greater infection risk than the unvaccinated, presumably because the latter group include more people with stronger natural immunity from prior Covid

disease. As a contrast, the vaccinated people had a lower risk of death than the unvaccinated, across all age groups, indicating that vaccines provide more protection against death than against infection. See also [UK PHE reports 43, 44, 45, 46](#) for similar data.

12) In Israel, [Levin et al.](#) “conducted a 6-month longitudinal prospective study involving vaccinated health care workers who were tested monthly for the presence of anti-spike IgG and neutralizing antibodies”. They found that “six months after receipt of the second dose of the BNT162b2 vaccine, humoral response was substantially decreased, especially among men, among persons 65 years of age or older, and among persons with immunosuppression.”

13) In a study from New York State, [Rosenberg et al.](#) reported that “During May 3–July 25, 2021, the overall age-adjusted vaccine effectiveness against hospitalization in New York was relatively stable 89.5%–95.1%). The overall age-adjusted vaccine effectiveness against infection for all New York adults declined from 91.8% to 75.0%.”

14) [Suthar et al.](#) noted that “Our data demonstrate a substantial waning of antibody responses and T cell immunity to SARS-CoV-2 and its variants, at 6 months following the second immunization with the BNT162b2 vaccine.”

15) In a study from Umeå University in Sweden, [Nordström et al.](#) observed that “vaccine effectiveness of BNT162b2 against infection waned progressively from 92% (95% CI, 92-93, $P<0.001$) at day 15-30 to 47% (95% CI, 39-55, $P<0.001$) at day 121-180, and from day 211 and onwards no effectiveness could be detected (23%; 95% CI, -2-41, $P=0.07$).”

16) [Yahi et al.](#) have reported that “in the case of the Delta variant, neutralizing antibodies have a decreased affinity for the spike protein, whereas facilitating antibodies display a strikingly increased affinity. Thus, antibody dependent enhancement may be a concern for people receiving vaccines based on the original Wuhan strain spike sequence.”

17) [Goldberg et al.](#) (BNT162b2 Vaccine in Israel) reported that “immunity against the delta variant of SARS-CoV-2 waned in all age groups a few months after receipt of the second dose of vaccine.”

18) [Singanayagam et al.](#) examined the transmission and viral load kinetics in vaccinated and unvaccinated individuals with mild delta variant infection in the community. They found that (in 602 community contacts (identified via the UK contract-tracing system) of 471 UK COVID-19 index cases were recruited to the Assessment of Transmission and Contagiousness of COVID-19 in Contacts cohort study and contributed 8145 upper respiratory tract samples from daily sampling for up to 20 days) “vaccination reduces the risk of delta variant infection and accelerates viral clearance. Nonetheless, fully vaccinated individuals with breakthrough infections have peak viral load similar to unvaccinated cases and can efficiently transmit infection in household settings, including to fully vaccinated contacts.”

19. [Keehner et al.](#) in NEJM, has recently reported on the resurgence of SARS-CoV-2 infection in a highly vaccinated health system workforce. Vaccination with mRNA vaccines began in mid-December 2020; by March, 76% of the workforce had been fully vaccinated, and by July, the percentage had risen to 87%. Infections had decreased dramatically by early February 2021...”coincident with the end of California’s mask mandate on June 15 and the rapid dominance of the B.1.617.2 (delta) variant that first emerged in mid-April and accounted for over 95% of UCSDH isolates by the end of July, infections increased rapidly, including cases among fully vaccinated persons...researchers reported that the “dramatic change in vaccine effectiveness from June to July is likely to be due to both the emergence of the delta variant and waning immunity over time.”

20. [Juthani et al.](#) sought to describe the impact of vaccination on admission to hospital in patients with confirmed SARS-CoV-2 infection using real-world data collected by the Yale New Haven Health System. “Patients were considered fully vaccinated if the final dose (either second dose of BNT162b2 or mRNA-1273, or first dose of Ad.26.COV2.S) was administered at least 14 days before symptom onset or a positive PCR test for SARS-CoV-2. In total, we identified 969 patients who were admitted to a Yale New Haven Health System hospital with a confirmed positive PCR test

for SARS-CoV-2”...Researchers reported “a higher number of patients with severe or critical illness in those who received the BNT162b2 vaccine than in those who received mRNA-1273 or Ad.26.COV2.S...”

21. A very recent study published by [the CDC](#) reported that a majority (53%) of patients who were hospitalized with Covid-19-like illnesses were already fully vaccinated with two-dose RNA shots. Table 1 reveals that among the 20,101 immunocompromised adults hospitalized with Covid-19, 10,564 (53%) were fully-vaccinated with the Pfizer or Moderna vaccine (Vaccination was defined as having received exactly 2 doses of an mRNA-based COVID-19 vaccine ≥ 14 days before the hospitalization index date, which was the date of respiratory specimen collection associated with the most recent positive or negative SARS-CoV-2 test result before the hospitalization or the hospitalization date if testing only occurred after the admission). This highlights the ongoing challenges faced with Delta breakthrough when vaccinated.

22. Eyre, 2021 looked at [The impact of SARS-CoV-2 vaccination on Alpha & Delta variant transmission](#). They reported that “while vaccination still lowers the risk of infection, similar viral loads in vaccinated and unvaccinated individuals infected with Delta question how much vaccination prevents onward transmission... transmission reductions declined over time since second vaccination, for Delta reaching similar levels to unvaccinated individuals by 12 weeks for ChAdOx1 and attenuating substantially for BNT162b2. Protection from vaccination in contacts also declined in the 3 months after second vaccination...vaccination reduces transmission of Delta, but by less than the Alpha variant.”

23. [Levine-Tiefenbrun](#), 2021 looked at [Viral loads of Delta-variant SARS-CoV-2 breakthrough infections after vaccination and booster with BNT162b2](#), and reported the viral load reduction effectiveness declines with time after vaccination, “significantly decreasing at 3 months after vaccination and effectively vanishing after about 6 months.”

24. Puranik, 2021 looked at a [Comparison of two highly-effective mRNA vaccines for COVID-19 during periods of Alpha and Delta variant prevalence](#), reporting “In July, vaccine effectiveness against hospitalization

has remained high (mRNA-1273: 81%, 95% CI: 33–96.3%; BNT162b2: 75%, 95% CI: 24–93.9%), but effectiveness against infection was lower for both vaccines (mRNA-1273: 76%, 95% CI: 58–87%; BNT162b2: 42%, 95% CI: 13–62%), with a more pronounced reduction for BNT162b2.”

25. Saade, 2021 looked at [Live virus neutralization testing in convalescent patients and subjects vaccinated against 19A, 20B, 20I/501Y.V1 and 20H/501Y.V2 isolates of SARS-CoV-2](#), and reported as “Assessed the neutralizing capacity of antibodies to prevent cell infection, using a live virus neutralization test with different strains [19A (initial one), 20B (B.1.1.241 lineage), 20I/501Y.V1 (B.1.1.7 lineage), and 20H/501Y.V2 (B.1.351 lineage)] in serum samples collected from different populations: two-dose vaccinated COVID-19-naïve healthcare workers (HCWs; Pfizer-BioNTech BNT161b2), 6-months post mild COVID-19 HCWs, and critical COVID-19 patients... finding of the present study is the reduced neutralizing response observed towards the 20H/501Y.V2 variant in fully immunized subjects with the BNT162b2 vaccine by comparison to the wild type and 20I/501Y.V1 variant.”

26. Canaday, 2021 looked at [Significant reduction in humoral immunity among healthcare workers and nursing home residents 6 months after COVID-19 BNT162b2 mRNA vaccination](#), reporting “Anti-spike, anti-RBD and neutralization levels dropped more than 84% over 6 months’ time in all groups irrespective of prior SARS-CoV-2 infection. At 6 months post-vaccine, 70% of the infection-naïve NH residents had neutralization titers at or below the lower limit of detection compared to 16% at 2 weeks after full vaccination. These data demonstrate a significant reduction in levels of antibody in all groups. In particular, those infection-naïve NH residents had lower initial post-vaccination humoral immunity immediately and exhibited the greatest declines 6 months later.”

27. Israel, 2021 looked at [Large-scale study of antibody titer decay following BNT162b2 mRNA vaccine or SARS-CoV-2 infection](#), and reported as “To determine the kinetics of SARS-CoV-2 IgG antibodies following administration of two doses of BNT162b2 vaccine, or SARS-CoV-2 infection in unvaccinated individuals...In vaccinated subjects, antibody titers decreased by up to 40% each subsequent month while in convalescents they

decreased by less than 5% per month. Six months after BNT162b2 vaccination 16.1% subjects had antibody levels below the sero-positivity threshold of <50 AU/mL, while only 10.8% of convalescent patients were below <50 AU/mL threshold after 9 months from SARS-CoV-2 infection.”

28. Eyran, 2020 examined [The longitudinal kinetics of antibodies in COVID-19 recovered patients over 14 months](#), and found “a significantly faster decay in naïve vaccinees compared to recovered patients suggesting that the serological memory following natural infection is more robust compared to vaccination. Our data highlights the differences between serological memory induced by natural infection vs. vaccination.”

29. [Salvatore et al.](#) examined the transmission potential of vaccinated and unvaccinated persons infected with the SARS-CoV-2 Delta variant in a federal prison, July-August 2021. They found a total of 978 specimens were provided by 95 participants, “of whom 78 (82%) were fully vaccinated and 17 (18%) were not fully vaccinated....clinicians and public health practitioners should consider vaccinated persons who become infected with SARS-CoV-2 to be no less infectious than unvaccinated persons.”

30) [Andeweg et al.](#) analyzed 28,578 sequenced SARS-CoV-2 samples from individuals with known immune status obtained through national community testing in the Netherlands from March to August 2021. They found evidence for an “increased risk of infection by the Beta (B.1.351), Gamma (P.1), or Delta (B.1.617.2) variants compared to the Alpha (B.1.1.7) variant after vaccination. No clear differences were found between vaccines. However, the effect was larger in the first 14-59 days after complete vaccination compared to 60 days and longer. In contrast to vaccine-induced immunity, no increased risk for reinfection with Beta, Gamma or Delta variants relative to Alpha variant was found in individuals with infection-induced immunity.”

31) [Di Fusco et al.](#) conducted an evaluation of COVID-19 vaccine breakthrough infections among immunocompromised patients fully vaccinated with BNT162b2. “COVID-19 vaccine breakthrough infections were examined in fully vaccinated (≥ 14 days after 2nd dose) IC individuals (IC cohort), 12 mutually exclusive IC condition groups, and a non-IC cohort.” They found that “of 1,277,747 individuals ≥ 16 years of age who

received 2 BNT162b2 doses, 225,796 (17.7%) were identified as IC (median age: 58 years; 56.3% female). The most prevalent IC conditions were solid malignancy (32.0%), kidney disease (19.5%), and rheumatologic/inflammatory conditions (16.7%). Among the fully vaccinated IC and non-IC cohorts, a total of 978 breakthrough infections were observed during the study period; 124 (12.7%) resulted in hospitalization and 2 (0.2%) were inpatient deaths. IC individuals accounted for 38.2% ($N=374$) of all breakthrough infections, 59.7% ($N=74$) of all hospitalizations, and 100% ($N=2$) of inpatient deaths. The proportion with breakthrough infections was 3 times higher in the IC cohort compared to the non-IC cohort ($N=374$ [0.18%] vs. $N=604$ [0.06%]; unadjusted incidence rates were 0.89 and 0.34 per 100 person-years, respectively.”

32) [Mallapaty](#) (NATURE) reported that the protective effect of being vaccinated if you already had infection is “relatively small, and dwindles alarmingly at three months after the receipt of the second shot.” Mallapaty further adds what we have been warning the public health community which is that persons infected with Delta have about the same levels of viral genetic materials in their noses “regardless of whether they’d previously been vaccinated, suggesting that vaccinated and unvaccinated people might be equally infectious.” Mallapaty reported on testing data from 139,164 close contacts of 95,716 people infected with SARS-CoV-2 between January and August 2021 in the United Kingdom, and at a time when the Alpha and Delta variants were competing for dominance. The finding was that “although the vaccines did offer some protection against infection and onward transmission, Delta dampened that effect. A person who was fully vaccinated and then had a ‘[breakthrough](#)’ Delta infection was almost twice as likely to pass on the virus as someone who was infected with Alpha. And that was on top of the higher risk of having a breakthrough infection caused by Delta than one caused by Alpha.”

33) [Chia et al.](#) reported that PCR cycle threshold (Ct) values were “similar between both vaccinated and unvaccinated groups at diagnosis, but viral loads decreased faster in vaccinated individuals. Early, robust boosting of anti-spike protein antibodies was observed in vaccinated patients, however, these titers were significantly lower against B.1.617.2 as compared with the wildtype vaccine strain.”

34) [Wilhelm et al.](#) reported on reduced neutralization of SARS-CoV-2 omicron variant by vaccine sera and monoclonal antibodies. “*in vitro* findings using authentic SARS-CoV-2 variants indicate that in contrast to the currently circulating Delta variant, the neutralization efficacy of vaccine-elicited sera against Omicron was severely reduced highlighting T-cell mediated immunity as essential barrier to prevent severe COVID-19.”

35) [CDC reported](#) on the details for 43 cases of COVID-19 attributed to the Omicron variant. They found that “34 (79%) occurred in persons who completed the primary series of an FDA-authorized or approved COVID-19 vaccine ≥ 14 days before symptom onset or receipt of a positive SARS-CoV-2 test result.”

36) [Dejnirattisai et al.](#) presented live neutralisation titres against SARS-CoV-2 Omicron variant, and examined it relative to neutralisation against the Victoria, Beta and Delta variants. They reported a significant drop in “neutralisation titres in recipients of both AZD1222 and BNT16b2 primary courses, with evidence of some recipients failing to neutralise at all.”

37) [Cele et al.](#) assessed whether Omicron variant escapes antibody neutralization “elicited by the Pfizer BNT162b2 mRNA vaccine in people who were vaccinated only or vaccinated and previously infected.” They reported that Omicron variant “still required the ACE2 receptor to infect but had extensive escape of Pfizer elicited neutralization.”

38) [Holm Hansen et al.](#)’s Denmark study looked at vaccine effectiveness against SARS-CoV-2 infection with the Omicron or Delta variants following a two-dose or booster BNT162b2 or mRNA-1273 vaccination series. A key finding was reported as “VE against Omicron was 55.2% initially following primary BNT162b2 vaccination, but waned quickly thereafter. Although estimated with less precision, VE against Omicron after primary mRNA-1273 vaccination similarly indicated a rapid decline in protection. By comparison, both vaccines showed higher, longer-lasting protection against Delta.” In other words, the vaccine that has failed against Delta is even far worse for Omicron. The table and figure below paint a devastating picture. See where the green dot is (Omicron variant) in the vertical lines (blue is Delta) and the 2 edges of the bars (upper and lower lips) 91 days out for

Omicron (3 months). Both Pfizer and Moderna show negative efficacy for Omicron at 31 days (both are below the 'line of no effect' or '0'). The comparative table is even more devastating for it shows how much less vaccine effectiveness there is for Omicron. For example, at 1-30 days, Pfizer showed 55.2% effectiveness for Omicron versus 86.7% for Delta, and for the same period, Moderna showed 36.7% effectiveness for Omicron versus 88.2% for Delta.

39) UK reporting showed that boosters protect against symptomatic COVID-19 caused by Omicron for about 10 weeks; the [UK Health Security Agency](#) reported protection against symptomatic COVID-19 caused by the variant dropped from 70% to 45% following a Pfizer booster for those initially vaccinated with the shot developed by Pfizer with BioNTech. Specifically reporting by the [UK Health Security Agency](#) showed "Among those who received an AstraZeneca primary course, vaccine effectiveness was around 60% 2 to 4 weeks after either a Pfizer or Moderna booster, then dropped to 35% with a Pfizer booster and 45% with a Moderna booster by 10 weeks after the booster. Among those who received a Pfizer primary course, vaccine effectiveness was around 70% after a Pfizer booster, dropping to 45% after 10-plus weeks and stayed around 70 to 75% after a Moderna booster up to 9 weeks after booster."

40) [Buchan et al.](#) used a test-negative design to assess vaccine effectiveness against OMICRON or DELTA variants (regardless of symptoms or severity) during November 22 and December 19, 2021. They included persons who had received at least 2 COVID-19 vaccine doses (with at least 1 mRNA vaccine dose for the primary series) and applied multivariable logistic regression modelling analysis to "estimate the effectiveness of two or three doses by time since the latest dose." They included 3,442 Omicron-positive cases, 9,201 Delta-positive cases, and 471,545 test-negative controls. Following 2 doses, "vaccine effectiveness against Delta infection declined steadily over time but recovered to 93% (95%CI, 92-94%) ≥ 7 days after receiving an mRNA vaccine for the third dose. In contrast, receipt of 2 doses of COVID-19 vaccines was not protective against Omicron. Vaccine effectiveness against Omicron was 37% (95%CI, 19-50%) ≥ 7 days after receiving an mRNA vaccine for the third dose."

41) [Public Health Scotland COVID-19 & Winter Statistical Report](#) (Publication date: 19 January 2022) provided startling data on page 38 (case rates), page 44 (hospitalization), and page 50 (deaths), showing that the vaccination has failed Delta but critically, is failing omicron. The 2nd inoculation data is of particular concern. Table 14 age-standardized case data is very troubling for it shows across the multiple weeks of study that across each dose (1 vs 2 vs 3 booster inoculations) that the vaccinated are greatly more infected than the unvaccinated, with the 2nd dose being alarmingly elevated (see grey rows). Age-standardized rates of acute hospital admissions are stunningly elevated after 2nd inoculation (over the unvaccinated) during January 2022. Looking at table 16 that reports on the number of confirmed COVID-19 related deaths by vaccination status, we again observe massive elevation in death at the 2nd inoculation. This data indicates to us that the vaccine is associated with infection and is not optimally working against omicron and that the protection is limited, waning rapidly.

42) [The UK's COVID-19 vaccine surveillance report Week 3, 20 January 2022](#), raises very serious concern as to the failure of the vaccines on Delta (which is basically now being replaced by omicron for dominance) and omicron. When we look at table 9, page 34 (COVID-19 cases by vaccination status between week 51 2021 and week 2 2022), we see greater case numbers for the 2nd and 3rd inoculations. The important table on page 38, Figure 12 (unadjusted rates of COVID-19 infection, hospitalization and death in vaccinated and unvaccinated populations) shows us a continual pattern in the UK data over the last 2 to 3 to 4 months, with the present reporting showing that persons in receipt of the 3rd inoculation (booster) at far greater risk of infection/cases than the unvaccinated (30 years of age and above age strata).

43) In the recent UK Public Health surveillance reports [Week 9](#), [Week 8](#), as well as week 7 ([UK COVID-19 vaccine surveillance report Week 7 17 February 2022](#)), week 6 ([COVID-19 vaccine surveillance report Week 6 10 February 2022](#)) and week 5 for 2022 ([COVID-19 vaccine surveillance report Week 5 3 February 2022](#)) as well as the reports accumulated for 2021 since vaccine roll-out, we see that the vaccinated are at higher risk of infection and especially for age groups above 18 years old, as well as hospitalization and even death. This is particularly marked for those in receipt of double

vaccinations. There is increased risk of death for those who are triple vaccinated and especially as age increases. The same pattern emerges in the Scottish data.

44.) [Regev-Yochay et al. in Israel](#) looked at (publication date March 16th 2022) the immunogenicity and safety of a fourth dose (4th) of either BNT162b2 (Pfizer–BioNTech) or mRNA-1273 (Moderna) administered 4 months after the third dose in a series of three BNT162b2 doses). This was an open-label, nonrandomized clinical study assessing the 4th dose in terms of need beyond the 3rd dose. Among the ‘1050 eligible health care workers enrolled in the Sheba HCW COVID-19 Cohort, 154 received the fourth dose of BNT162b2 and, 1 week later, 120 received mRNA-1273. For each participant, two age-matched controls were selected from the remaining eligible participants’.

Researchers further reported that ‘overall, 25.0% of the participants in the control group were infected with the omicron variant, as compared with 18.3% of the participants in the BNT162b2 group and 20.7% of those in the mRNA-1273 group. Vaccine efficacy against any SARS-CoV-2 infection was 30% (95% confidence interval [CI], –9 to 55) for BNT162b2 and 11% (95% CI, –43 to 44) for mRNA-1273...most of the infected participants were potentially infectious, with relatively high viral loads (nucleocapsid gene cycle threshold, ≤ 25)’. Results suggest that maximal immunogenicity of mRNA vaccines is achieved after three doses. More specifically, researchers ‘observed low vaccine efficacy against infections in health care workers, as well as relatively high viral loads suggesting that those who were infected were infectious. Thus, a fourth vaccination of healthy young health care workers may have only marginal benefits’.

45.) [Andrews et al.](#) used a test-negative case-control design to estimate vaccine effectiveness against symptomatic disease caused by the omicron and delta (B.1.617.2) variants in England. “Vaccine effectiveness was calculated after primary immunization with two doses of BNT162b2 (Pfizer-BioNTech), ChAdOx1 nCoV-19 (AstraZeneca), or mRNA-1273 (Moderna) vaccine and after a booster dose of BNT162b2, ChAdOx1 nCoV-19, or mRNA-1273.” The results showed that immunization with two doses of ChAdOx1 nCoV-19 or BNT162b2 vaccine gave very limited protection against symptomatic

disease caused by the omicron variant. “A BNT162b2 or mRNA-1273 booster after either the ChAdOx1 nCoV-19 or BNT162b2 primary course substantially increased protection, but that protection waned over time.”



Detection of microplastics in human lung tissue using μ FTIR spectroscopy

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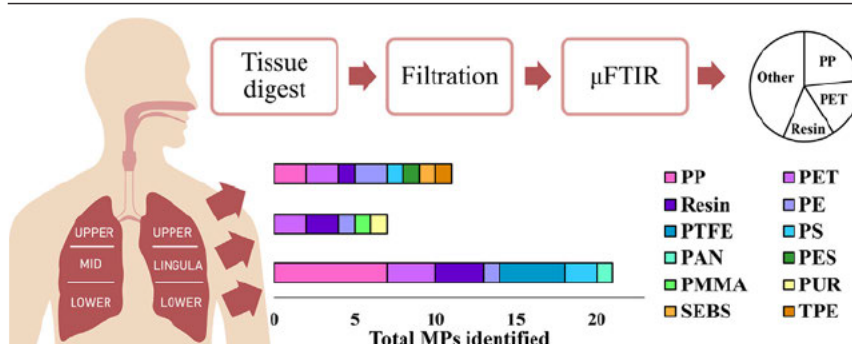
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HIGHLIGHTS

- Microplastics were identified in all regions of the human lungs using μ FTIR analysis.
- Polypropylene and polyethylene terephthalate fibres were the most abundant.
- The results support inhalation as a route of MP exposure.

GRAPHICAL ABSTRACT



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ABSTRACT

Airborne microplastics (MPs) have been sampled globally, and their concentration is known to increase in areas of high human population and activity, especially indoors. Respiratory symptoms and disease following exposure to occupational levels of MPs within industry settings have also been reported. It remains to be seen whether MPs from the environment can be inhaled, deposited and accumulated within the human lungs. This study analysed digested human lung tissue samples ($n = 13$) using μ FTIR spectroscopy (size limitation of $3 \mu\text{m}$) to detect and characterise any MPs present. In total, 39 MPs were identified within 11 of the 13 lung tissue samples with an average of 1.42 ± 1.50 MP/g of tissue (expressed as 0.69 ± 0.84 MP/g after background subtraction adjustments). The MP levels within tissue samples were significantly higher than those identified within combined procedural/laboratory blanks ($n = 9$ MPs, with a mean \pm SD of 0.53 ± 1.07 , $p = 0.001$). Of the MPs detected, 12 polymer types were identified with polypropylene, PP (23%), polyethylene terephthalate, PET (18%) and resin (15%) the most abundant. MPs (unadjusted) were identified within all regions of the lung categorised as upper (0.80 ± 0.96 MP/g), middle/lingular (0.41 ± 0.37 MP/g), and with significantly higher levels detected in the lower (3.12 ± 1.30 MP/g) region compared with the upper ($p = 0.026$) and mid ($p = 0.038$) lung regions. After subtracting blanks, these levels became 0.23 ± 0.28 , 0.33 ± 0.37 and 1.65 ± 0.88 MP/g respectively. The study demonstrates the highest level of contamination control and reports unadjusted values alongside different contamination adjustment techniques. These results support inhalation as a route of exposure for environmental MPs, and this characterisation of types and levels can now inform realistic conditions for laboratory exposure experiments, with the aim of determining health impacts.

Abbreviations: LOD, limit of detection; LOQ, limit of quantitation; μ FTIR, micro Fourier Transform Infrared; MCT, mercury cadmium telluride; MP, microplastics between $1 \mu\text{m}$ and 5mm ; NP, nanoplastics; PAN, polyacrylonitrile; PE, polyethylene; PES, polyester; PET, polyethylene terephthalate; PMMA, polymethylmethacrylate; PP, polypropylene; PS, polystyrene; PTFE, polytetrafluoroethylene; PUR, polyurethane; PVA, polyvinyl alcohol; ROS, reactive oxygen species; SEBS, styrene-ethylene-butylene co-polymer; TPE, thermoplastic elastomer.

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1. Introduction

Microplastics (MPs), defined herein as plastic particles between 1 μm and 5 mm (Hartmann et al., 2019), are present in all environmental compartments; from marine and freshwater bodies (GESAMP, 2015), to soil (Wang et al., 2019), food, drinking water (Danopoulos et al., 2020a; Danopoulos et al., 2020b), and air (Allen et al., 2019; Dris et al., 2017; Cai et al., 2017; Jenner et al., 2021). For the latter, suspended MP particles have been isolated from many atmospheric locations, including urbanised city centres (Cai et al., 2017; Wright et al., 2019a; Liu et al., 2019a), indoor households (Dris et al., 2017; Jenner et al., 2021; Vianello et al., 2019; Zhang et al., 2020), and remote outdoor regions (Allen et al., 2019). Previous work highlights that citizens are exposed to higher concentrations of MP within their homes (Jenner et al., 2021) or outdoor areas of high human activity (Jenner et al., 2022), and this results in ubiquitous and unavoidable human exposure (Prata et al., 2020). Consequently, there is an increasing concern regarding the hazards associated with MP ingestion, dermal contact, and inhalation (Prata et al., 2020).

Synthetic fibres have previously been observed within human lung tissue samples (Pauly et al., 1998), yet limited studies confirm the presence of MPs within the lungs alongside chemical analysis tools, such as μRaman and μFTIR spectroscopy (Amato Lourenço et al., 2021). Reliance upon observational criteria alone to distinguish between MP and non MPs, can lead to over and under estimated MP counts, and a lack of information relating to polymer or additive type (Eriksen et al., 2013; Hidalgo Ruz et al., 2012). The plausibility of MP inhalation has been highlighted (Prata, 2018; Wright and Kelly, 2017) and MPs with a width as small as 5 μm have been reported within air samples (Wright et al., 2019a; Li et al., 2020). Upon environmental release, plastics are exposed to oxidation, mechanical stress and biological action, resulting in embrittlement and fragmentation, forming MPs, and eventually nanoplastics (NPs) (<1 μm), as well as release into the environment in their primary form (Hidalgo Ruz et al., 2012).

Historical studies report respiratory symptoms and disease at an occupational level of exposure in synthetic textile, flock, and vinyl chloride workers (Prata, 2018), and as such, support inhalation as an exposure route for MPs. However, it remains unclear whether MPs can enter and remain in the lungs of the general population due to environmental exposure, rather than the chronic levels seen within industry settings. MPs are designed to be robust materials, unlikely to break down within the lungs (Law et al., 1990), potentially leading to accumulation over time depending on aerodynamic diameter and respiratory defences (Prata, 2018).

The mounting concern surrounding airborne MPs stems from the unknown polymer types, levels of exposure, and consequences of their inhalation. MP characteristics such as size, shape, vectored absorbed pollutants and pathogens, as well as plastic monomer or additive leaching, have been highlighted as potential promoters of cytotoxicity (Wright and Kelly, 2017). MPs are consistently identified within air samples, their concentration is highest indoors (Dris et al., 2017; Vianello et al., 2019; Zhang et al., 2020) and within highly populated areas (Cai et al., 2017), they are readily suspended at times of high human activity (Zhang et al., 2020) and are often small and fibrous (Liu et al., 2019a). Together, these concerns highlight the necessity for accurate tissue analysis to understand the potential for these synthetic polymers to penetrate the human respiratory system and cause harm.

This study aims to identify any MP particles present in digested human lung tissue samples, while also accounting for procedural and laboratory blank contamination. Any particles isolated from lung tissue have been chemically characterised using μFTIR spectroscopy (with a 3 μm lower size limit of detection).

2. Material and methods

2.1. Human tissue acquisition

Excess human lung tissue was collected from thoracic surgical procedures at Castle Hill Hospital, Hull University Teaching Hospitals NHS

Trust, following NHS Research Ethics Committee and Health Research Authority approval (REC reference 12/SC/0474). Samples of peripheral human lung tissue were collected from upper, middle (left lingula) or lower lobe specimens following surgical resection for cancer or lung volume reduction surgery. Descriptions of the tissue origin were provided by the surgical team. Care was taken to avoid the tumour margins. Details of the donors smoking status, occupation and area of residence were unavailable for the researchers under the terms of the ethical approval obtained. Tissue samples were placed into empty glass containers with foil lids and immediately frozen (-80°C) until bulk analysis (two batches) was conducted. Lung tissue was obtained from 11 patients (numbered 1.1 to 11.1), with patients 1 and 2 providing two samples (numbered 1.2 and 2.2) from different lung positions ($n = 13$, total tissue mass = 55.41 g), resulting in a mean mass of 4.26 ± 3.87 g (range 0.79–13.33 g). Patients mean age was 63 ± 13 years (range 32–77), 5 females and 6 males (Table 1).

2.2. Lung tissue digestion and filtration

Thawed samples were exposed to a hydrogen peroxide (100 mL of 30% H_2O_2) bath and rinsed alongside 'procedural blanks' ($n = 4$) (Supplementary Fig. S1). Each tissue sample was transferred to a clean glass conical flask with a foil covering, and 100 mL of 30% H_2O_2 added. The total mass of each individual tissue sample digested is detailed in Table 1. Flasks were placed in a shaking incubator at 55°C for approximately 11 days, 65 rpm, or until there was no visible tissue. After 5 days within the incubator, an additional 100 mL of 30% H_2O_2 was added. The digest, adapted from previous studies investigating MPs within different environmental and tissue samples (Munno et al., 2018), ensures removal of organic particles while maintaining MP integrity (Allen et al., 2019; Munno et al., 2018). Samples were then filtered onto aluminium oxide filters (0.02 μm Anodisc, Watford, U.K.) using a glass vacuum filtration system. These were stored in clean glass petri dishes, in the dark, before chemical composition analysis alongside laboratory blanks ($n = 13$) (Supplementary Fig. S1).

2.3. Chemical characterisation of particles using μFTIR analysis

Each tissue sample Anodisc filter was placed directly onto the μFTIR spectroscopy platform, and the length (largest side) and width (second largest side) recorded using the aperture height, width and angle size selection tool, available within the ThermoScientific Omnic Picta Nicolet iN10 microscopy software. Particles were then assigned to a shape category (fibre, film, fragment, foam, or sphere (Free et al., 2014)), whereby fibrous particles were characterised as having a length to width ratio > 3 (Vianello et al., 2019).

μFTIR spectroscopy analysis was conducted in liquid nitrogen cooled transmission mode (Nicolet iN10, ThermoFisher, Waltham MA, U.S.A.), without the aid of further accessories or crystals. The cooled mercury cadmium telluride (MCT) detector allowed for the analysis of particles accurately down to 3 μm in size. The Nicolet iN10 microscope used is equipped with 15×0.7 N.A. high efficiency objective and condenser. It has a colour CCD digital video camera with an independent reflection and transmission illuminations mounted, for capturing images of particles. This model has a standardised $123\times$ magnification with the aperture settings used. No observational criteria (Hidalgo Ruz et al., 2012) was applied to select specific particles for μFTIR analysis, to prevent bias. Using the aperture size selection tool, all particles upon the sample filter $> 3 \mu\text{m}$ were included in the analysis process. For this study, the whole filter, containing the total digested tissue sample, was analysed.

A background reference spectrum was first recorded, using identical parameters to the particles undergoing analysis. A blank area of the Anodisc filter was chosen as the site for background collection before immediate analysis of the sample particles. μFTIR parameters were; spectral range of $4000-1250\text{ cm}^{-1}$, high spectral resolution 8 cm^{-1} , scan number of 64. No smoothing, baseline correction or data transformation was attempted. Resulting sample spectra were compared to a combination of polymer libraries (Omnic Picta, Omnic Polymer Libraries), available with the Omnic

Table 1

Patient and tissue sample information alongside the number of MPs identified within samples by μ FTIR spectroscopy. Polymer types and particle characteristics are included, and three different contamination adjustments to display results in units of MP/g of tissue. Abbreviations; PAN = polyacrylonitrile, PE = polyethylene, PES = polyester, PET = polyethylene terephthalate, PMMA = polymethylmethacrylate, PP = polypropylene, PS = polystyrene, PTFE = polytetrafluoroethylene, PUR = polyurethane, Resin = alkyd/epoxy/hydrocarbon, SEBS = styrene-ethylene-butylene co-polymer, TPE = thermoplastic elastomer. R = right lung, L = left lung, Low = lower region of the lung, mid = middle/lingular region of the lung, up = upper region of the lung.

ID	Sex	Lung region	Tissue (g)	MP total	MP polymer	Length, width (μ m)	Shape	MP/g ^a	MP/g ^b	MP/g ^c
1.1	M	R, Low	2.02	8	PET PP PP PP PP PS PTFE PTFE	88, 10 55, 28 39, 18 420, 9 27, 10 89, 71 100, 29 92, 88	Fibre Fragment Fragment Fibre Fragment Fragment Fibre Film	3.96	2.97	1.94 based on PP only
1.2		R, Up	0.79	2	PP TPE	109, 18 66, 19	Fibre Fibre	2.53	0.00	
2.1	M	R, Low	0.80	3	PP PP PTFE	40, 22 144, 65 26, 20	Fragment Fragment Fragment	3.75	1.25	
2.2		L, Low	0.84	3	PS PTFE Resin	14, 14 96, 5 19, 13	Fragment Fibre Fragment	3.57	1.19	
3.1	M	R, Up	13.33	5	PE PE PET PP SEBS	224, 9 29, 17 202, 6 101, 17 83, 18	Fibre Fragment Fibre Fibre Film	0.38	0.23	
4.1	M	R, Up	1.53	2	PS Resin	60, 44 12, 9	Fragment Fragment	1.31	0.65	
5.1	F	L, Lin	1.37	0	none	none		0.00	0.00	
6.1	M	R, Mid	3.98	2	PE Resin	17, 10 20, 15	Fragment Fragment	0.50	0.25	
7.1	F	R, Up	8.29	1	PES	40, 22	Fragment	0.12	0.00	
8.1	F	L, Low	5.90	7	PAN PE PET PET PP Resin Resin	1112, 9 28, 20 443, 13 452, 12 160, 46 101, 9 261, 22	Fibre Fragment Fibre Fibre Fragment Fibre Fibre	1.19	1.19	
9.1	M	R, Mid	6.84	5	PET PET PMMA PUR Resin	897, 10 2475, 12 96, 76 155, 16 14, 4	Fibre Fibre Fragment Fibre Fibre	0.73	0.73	
10.1	F	R, Up	2.12	1	PET	275, 12	Fibre	0.47	0.47	
11.1	F	R, Up	7.60	0	none	none		0.00	0.00	
Mean \pm SD								1.42 \pm 1.5	0.69 \pm 0.84	

^a Total MPs detected with no account taken for MPs found in controls.

^b Total MPs in sample minus total MPs identified in controls (regardless of polymer type) (Supplementary information).

^c MP contamination levels after LoD/LoQ method (Cowger et al., 2020), if meeting the threshold (Supplementary information).

Picta software, and full spectral ranges were used with a match threshold of $\geq 70\%$. If particles were below the $\geq 70\%$ match index threshold, three attempts were made to collect a successful match before moving on to the next particle undergoing analysis. Particles below $\geq 70\%$ match, and particles not classified as a plastic were recorded but not included in the results presented (Cowger et al., 2020).

During μ FTIR analysis, one 'laboratory blank' Anodisc filter was opened alongside every sample filter (Supplementary Fig. S1). A total of 13 lung tissue samples were analysed, plus 4 'procedural blanks', and 13 'laboratory blanks'. The total number of particles (MPs and others) identified was 296, whereby 225 (76%) of these were above the 70% hit quality index threshold. Only the MPs data is shown in the results. Identified PET and PES MP particles were reported separately within this study, using a high match ($>70\%$) on a polymer database search to confirm their identities.

2.4. Quality assurance and control measures to reduce and quantify background MP contamination

Strict control measures were adhered to, in order to quantify and characterise the nature of any unavoidable background contamination. Due to

the ubiquitous nature of MPs in the air, contamination upon the surface of lung tissue samples could be possible during the surgical procedure, where lung tissue was removed from live human subjects. While it was not possible to fully control the surgical environment, each tissue sample was dropped into a 100 mL 30% H₂O₂ bath, re sealed with foil and agitated for 2 min. In parallel, 'procedural blanks' (n = 4) were initiated. The tissue sample was removed, and the outer surface rinsed thoroughly with 100 mL 30% H₂O₂ to remove any surface contamination, employing a method similar to extracting microplastics from whole biota (Brander et al., 2020). Analysis of solely the interior portion of the tissue was considered (Pauly et al., 1998) but was not applied with the aim of maintaining a larger tissue mass. Tissue samples were digested in two batches, with two procedural blanks, which mimicked the entire tissue processing steps but lacked the lung tissue sample, alongside each batch (Supplementary Fig. S1). Reagents were filtered and prepared in bulk for each batch. When conducting μ FTIR analyses, a 'laboratory blank' filter (n = 13), placed in a glass sealed petri dish, was opened for the same duration as that for the tissue sample.

MPs found within 'procedural blanks' represent contamination from the laboratory reagents, equipment or fallout from the air during the transfer of samples. For each batch, the average procedural contamination was

calculated and assumed to be present within each of the tissue samples. MPs within 'laboratory blanks' represent contamination from atmospheric fall out within the μ FTIR laboratory room during particle characterisation. Procedural blank and laboratory blank results were combined to account for contamination at every step. No standardised protocols are currently adopted within the MPs research field to account for background contamination, so multiple contamination adjustments were applied in this study for comparison. These comprised two approaches: subtraction, routinely used in the MP research field, and a limit of detection (LOD) and limit of quantification (LOQ) technique (Horton et al., 2021) (Supplementary methods S1). Presenting raw data, subtraction, and LOD/LOQ adjusted results allows a comparison for each technique.

All H_2O_2 and MilliQ water used were triple filtered using an all glass vacuum filtration kit and 47 mm glass fibre grade 6 filters (GE Healthcare Life Sciences, Marlborough MA, U.S.A.). All glassware underwent thorough manual cleaning, before a dishwasher cycle using distilled water and then a manual three rinse wash with triple filtered MilliQ water. All equipment and reagents were always covered with foil lids and a small opening made when pouring. Additionally, when filtering digested samples, glassware and the sides of the filtration kit were rinsed three times with triple filtered MilliQ water to avoid sample particle loss. All work was conducted in a thoroughly cleaned fume cupboard with power 'off' and shield down to minimise unfiltered air flow (Wesch et al., 2017) and particle suspension (Wright et al., 2019b). Each tissue sample was processed individually to prevent cross contamination. Plastic equipment was avoided, glass petri dishes, a cotton laboratory coat, and a new set of nitrile gloves for each sample processing step were used. Tissue preparation and particle analysis was conducted at times of low activity, no room ventilation and μ FTIR conducted in a single person room with no windows. Finally, work was conducted by a single researcher for standardisation. To ensure no particles were contaminating the Anodisc filters from the manufacturing process of the discs used, three random filters were chosen and observed under the μ FTIR, in which no particles were present.

2.5. Statistical analysis

Tests for homogeneity and significance were performed on unadjusted MP values using SPSS. All data were determined not normally distributed with a Shapiro Wilk test and either a Kruskal Wallis or Mann Whitney *U* test applied.

3. Results

3.1. MP abundance levels detected in human lung tissue samples

A total of 39 MPs were identified within 11 of the 13 human lung tissue samples. An overall unadjusted mean of 3.00 ± 2.55 MPs per sample (range 0–8 MPs) were identified within human lung tissue samples, significantly higher levels ($p = 0.001$) compared with 0.53 ± 1.07 MP per sample detected in the combined blanks. When considering the mass of the tissue sample, without accounting for background contamination, a mean of 1.42 ± 1.50 MP/g was detected (Table 1). After subtracting background contamination, this value becomes 0.69 ± 0.84 MP/g (Table 1). An unadjusted mean of 2.09 ± 1.54 MP/g of tissue was identified in male ($n = 6$) and 0.36 ± 0.50 MP/g of tissue in female ($n = 5$) samples (adjusted to 0.91 ± 0.95 MP/g and 0.33 ± 0.52 MP/g respectively after subtracting background contamination). All male samples contained at least one MP particle, while two of the five female samples did not. The data was not normally distributed ($p = 0.013$), and a Mann Whitney *U* test revealed tissue samples from male patients had significantly higher levels of MP/g compared to females ($p = 0.019$). A detailed description of the characterisation of background MP contamination (procedural and laboratory blanks) can be found in the supplemental information (Table S1).

3.2. MP particle characterisation from human lung tissue samples

A total of 12 polymer types were identified in the tissue samples, as detailed in Fig. 1A. PP (9, 23%) and PET (7, 18%) were the most abundant

(Fig. 1A). All MPs identified within tissue samples were fibre (19, 49%), fragment (17, 43%), or film (3, 8%), (Figs. 1B, 2). MP particles identified within the tissue samples had a mean particle length of 223.10 ± 436.16 μ m (range 12–2475 μ m), and a mean particle width of 22.21 ± 20.32 μ m (range 4–88 μ m) (Fig. 3A).

3.3. Characterisation of background MP contamination (procedural and laboratory blanks)

Considering all the blank samples, the mean background MP contamination rate detected was 0.53 ± 1.07 MP per blank. Particles identified within 'procedural blanks' had a mean MP contamination rate of 2.00 ± 2.83 MP per sample (range 0–4), for batch 1, whereby four MPs were identified on one filter: PE, PE/PP, PS, and a resin particle. No MPs were detected on the second filter for batch 1 (Table S1). No particles were identified within 'procedural blanks' from batch 2 of tissue samples on either of the two procedural blank filters (Table S1). Particles detected from 'laboratory blanks' ($n = 13$) had an overall mean MP contamination rate of 0.38 ± 0.65 MP per sample (range 0–2). This comprised one PET, PP, PS, PTFE and PVA particle from the 13 laboratory control filters (Table S1). The average length of MPs detected within the combined blank samples was 105.22 ± 92.82 μ m (range 23–315 μ m), and an average width of 34.44 ± 22.61 μ m (range 15–73 μ m). The shapes of MPs identified in the combined blank samples were either fragment (6, 67%), fibre (2, 22%), or film (1, 11%).

In addition to MP particles, non MP 'natural polymer' particles were detected on the sample filters. Combining non MP procedural and laboratory blank results 9.04 ± 4.84 non MP particles per sample were detected, comprised of cellulose and zein.

3.4. Background MP contamination adjustments

Using adjustments, to account for the combined procedural and blank contamination levels detected, decreases the level of MPs identified within tissue samples depending on the approach used (Table 1). After blank subtraction adjustments, the total MPs identified within tissue samples have a mean of 0.69 ± 0.84 MP/g of tissue. Subtraction adjusted MP levels in human lung tissues were statistically significant compared to blank data (Mann Whitney *U* test, $p = 0.043$). Only one lung tissue sample (sample 1.1) fit the criteria for using a LOD and LOQ calculation, showing 1.94 MP/g, above the quantification threshold. The polymer type detected above this threshold was PP. MPs above the LOD, that can be detected within lung tissue samples, but not quantified, were PE, PET, PP, PTFE and resin.

3.5. MP distribution within human samples by lung region

MPs were identified within all regions of the lung (Fig. 4 and Table S2). An unadjusted mean of 0.80 ± 0.96 MP/g was identified within the upper region (adjusted to 0.23 ± 0.28 MP/g after background subtraction), 0.41 ± 0.37 MP/g within the middle/lingular region (adjusted to 0.33 ± 0.37 MP/g) and 3.12 ± 1.30 MP/g within the lower region (adjusted to 1.65 ± 0.88 MP/g). Data was not normally distributed ($p = 0.013$) and a Kruskal Wallis test showed that the number of MPs in the lower region were significantly higher than the middle/lingular ($p = 0.038$) and the upper region ($p = 0.026$). Within the upper region ($n = 6$, total mass = 33.66 g), 11 MPs were identified; PE (2, 18%), PET (2, 18%), PP (2, 18%), PES (1, 9%), PS (1, 9%), resin (1, 9%), SEBS (1, 9%), TPE (1, 9%). Within the middle/lingular region ($n = 3$, total tissue mass = 12.19 g), 7 MPs were identified; PET (2, 29%), resin (2, 29%), PE (1, 14%), PMMA (1, 14%), PUR (1, 14%). Within the lower region ($n = 4$, total tissue mass = 9.56 g), 21 MPs were identified; PP (7, 33%), PTFE (4, 19%), PET (3, 14%), Resin (3, 14%), PS (2, 10%), PAN (1, 5%), PE (1, 5%) (Fig. 4).

3.6. MP distribution within human lung tissue by individual patient

MPs were identified in 9 of the 11 patient lung samples. Multiple samples were taken from patient 1; 8 MPs in sample 1.1 and 2 MPs in sample

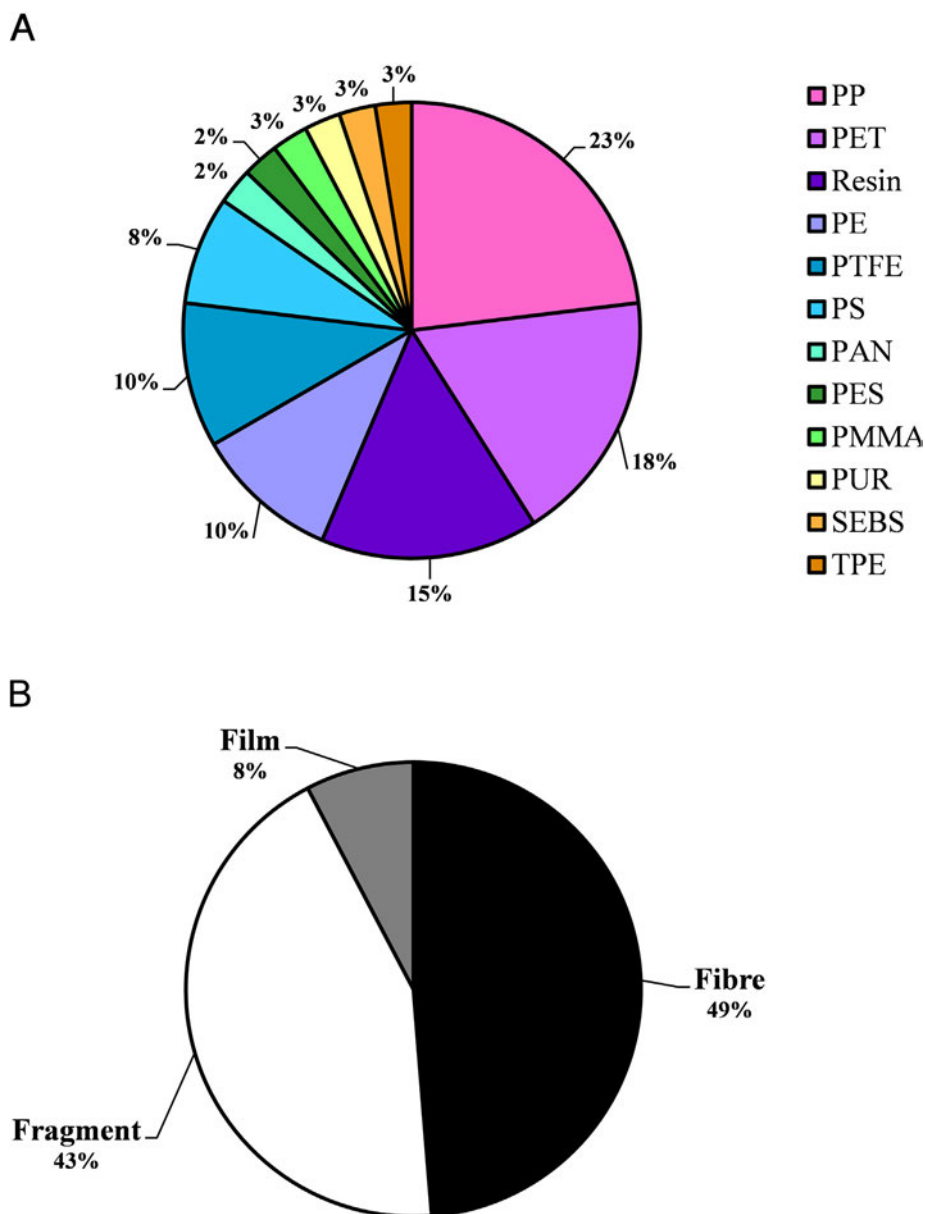


Fig. 1. Polymer types (A) and shapes (B) of the MPs identified within lung tissue samples.

1.2 (Fig. 5A). PP particles were identified within both samples (Fig. 5B). Multiple samples were also taken from patient 2; 3 MPs in sample 2.1 and 3 MPs in sample 2.2. PTFE particles were identified within both samples, while multiple polymers were only identified within one patient sample (Fig. 5B).

4. Discussion

This report provides compelling evidence of MPs within human lung tissue samples, using a robust, best practice, background contamination regime combined with μ FTIR chemical composition analysis to verify the particles present. The study also highlights the importance of including and evaluating contamination adjustments within MP research, while providing high levels of quality assurance and control.

In total, 39 MPs were identified within 11 of the 13 lung tissue samples, with an unadjusted average of 1.42 ± 1.50 MP/g of tissue. By subtracting any MPs detected in the corresponding blanks, an adjusted average of 0.69 ± 0.84 MP/g tissue sample is reported. The MP levels within tissue samples were significantly higher than those identified within combined

procedural/laboratory blanks. Of the MPs detected, 12 polymer types were identified with PP (23%), PET (18%), resin (15%), and PE (10%) the most abundant. It should be noted that the FTIR spectra for PET and PES (polyester) are similar and can be difficult to distinguish (Primpke et al., 2018; Veerasingam et al., 2021), however a high match of 70% was accepted to distinguish between the MP types within this study.

MPs were identified within all regions of the lung categorised as upper (0.80 ± 0.96 MP/g), middle/lingular (0.41 ± 0.37 MP/g), and lower (3.12 ± 1.30 MP/g) region. However, when a LOD and LOQ approach was applied, only one tissue sample fit the criteria, with only PP detected above the threshold levels at 1.94 MP/g (Table 1). It could be that most MPs identified were contamination, however the LOD LOQ could also be 'masking' legitimately identified MPs. The LOD LOQ adjustment approach dramatically reduced the level of quantifiable MPs identified within lung tissue samples. This quality control measure has the benefit of providing a threshold above that of a simple subtraction, allowing MPs to be reliably detected and quantified (Brander et al., 2020). Although it is an emerging technique within the MP field, it has the potential to account for polymer type as well as quantity and is commonly applied within analytical

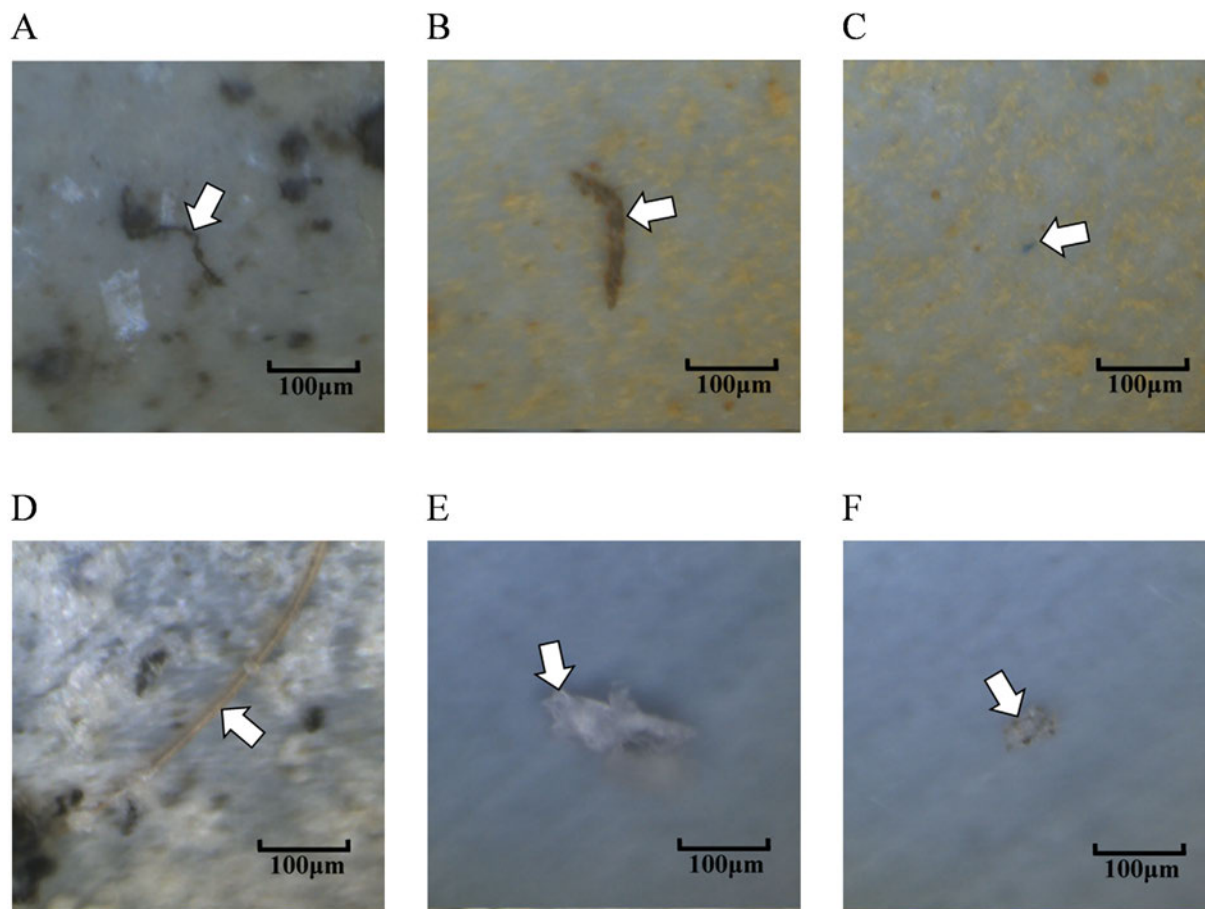


Fig. 2. Images of MPs identified from human lung tissue samples. A, B, C and D = (A = PET) (B = PUR) (C = Resin) (D = PAN). E and F = MPs identified within blanks. (E = PS) (F = PP). Corresponding spectra included in Fig. S2.

chemistry. However, samples containing low numbers of MPs, such as the human lung tissue samples reported here, commonly only have one MP particle per polymer type identified in a sample. It has been reported that when dealing with such low MP quantities within samples, the LOD LOQ technique will have more significant effects and lead to a “reduced capacity to report any MPs above the LOD or LOQ” (Horton et al., 2021). We therefore report our results in three ways; unadjusted, subtraction adjusted and LOD LOQ adjusted, but highlight the importance of the LOD LOQ technique for future studies in which MP abundance is not as low.

MPs have, to date, been detected in human samples from histological lung cancer samples (Pauly et al., 1998) and cadavers (Amato Lourenço et al., 2021) as well as from human placenta (Ragusa et al., 2021). Our findings are consistent with an early study by Pauly et al. (1998) using microscopy under polarised light to identify fibres (though without chemical characterisation validation or rigorous contamination control measures), reporting presence of fibres in 83% of nonneoplastic lung specimens ($n = 67/81$) and in 97% of malignant lung specimens ($n = 32/33$) (Pauly et al., 1998). This study also reported that the fibres were distributed throughout all regions of the lung and were not confined to the large air spaces (Pauly et al., 1998). While no formal size range is given in this early study, they reported heterogeneity with respect to fibre length, width, surface morphology and colour, with $>250 \mu\text{m}$ length and $\sim 50 \mu\text{m}$ width (Pauly et al., 1998). Our findings are also in line with a recent publication by Amato Lourenço et al. who also found PP to be amongst the most abundant plastics identified (Amato Lourenço et al., 2021). In contrast to our study, Amato Lourenço et al. showed that non fibrous particles were the most abundant type of MP with sizes smaller than those seen in our study. This could partly be due to differing exposures to MP, our best

practice approach used to eliminate background contamination, or the methods used to detect and characterise samples, Raman vs. μFTIR . Although Raman spectroscopy has the advantage of a lower method detection limit ($\sim 1 \mu\text{m}$), which might explain the abundance of smaller particles identified in Amato Lourenço study (Amato Lourenço et al., 2021), it can be heavily influenced by fluorescence interference and does not detect the same polar peaks that μFTIR spectroscopy can. Additionally, Raman spectroscopy can UV degrade the particles being analysed, which could hinder potential future investigations. Thus, although both spectroscopic techniques complement each other, μFTIR has some advantages that benefit MP research (Silva et al., 2018).

Interestingly, tissue from male donors contained significantly higher levels of unadjusted MP ($2.09 \pm 1.54 \text{ MP/g}$) compared to females ($0.36 \pm 0.50 \text{ MP/g}$), with all samples from males containing MPs but two out of five samples from females showing no MPs. We hypothesise that this is due female airways being significantly smaller than the airways of males (Dominelli et al., 2018), although the relatively small sample size used herein dictates that more analyses be conducted to explore such differences further.

According to Donaldson et al. (1993), only particles with a physical diameter smaller than $3 \mu\text{m}$ can enter the alveolar region of the lung (Donaldson et al., 1993). The alveolar duct is reported in the literature as being $\sim 540 \mu\text{m}$ diameter and $1410 \mu\text{m}$ long (Horsfield et al., 1971). Particles of a size ranging from 12 to $2475 \mu\text{m}$ for length and 4 to $88 \mu\text{m}$ for width were detected within lung samples in this study, in theory, too large to be present, yet present nonetheless.

While the fate of particles entering the lung, and their resulting biological effects in terms of inflammation responses, are well established for ultrafine particulates in the NP or PM_{10} size range (Oberdörster et al., 1994; Kreyling

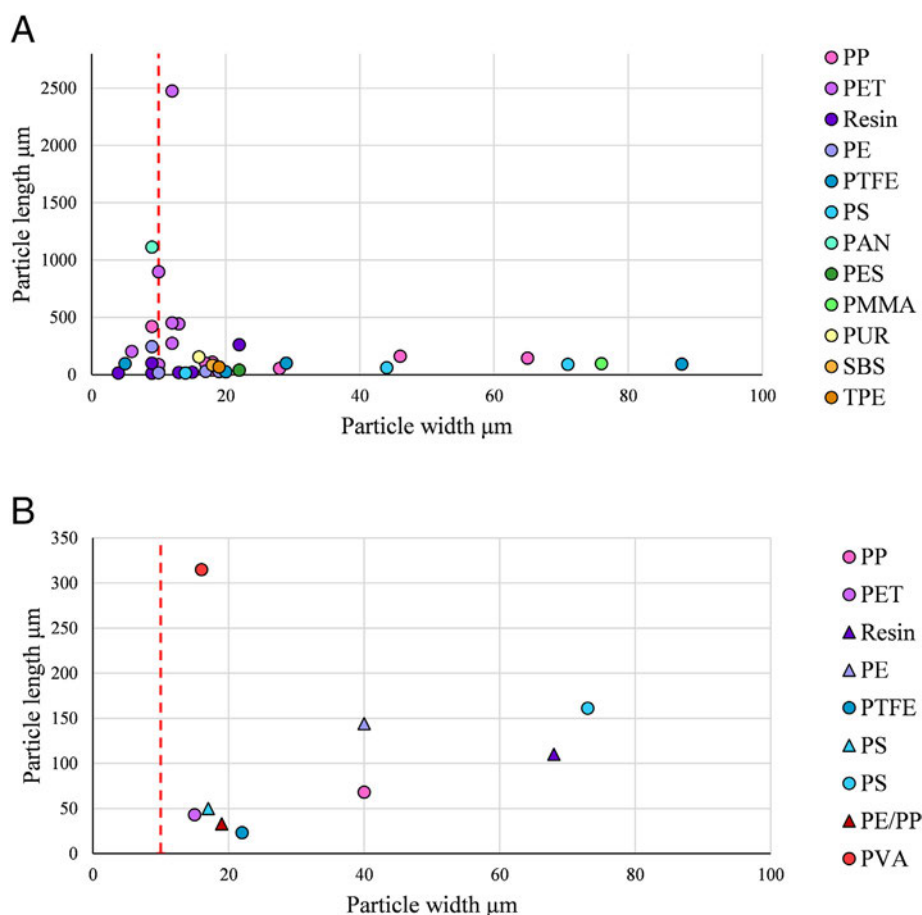


Fig. 3. Polymer size dimensions and type of each MP identified within (A) human lung tissue samples and (B) 'procedural blank' (triangles) and 'laboratory blank' (circles) samples. Red line represents the assumed inhalable size limit regardless of density.

et al., 2006), the corresponding information is currently unavailable for the MP size range of particles observed here, highlighting a serious gap in the knowledge. There are limited recent studies giving evidence of particle sizes and deposition in the lungs. It could be that there may be a pre conceived assumption about the particle sizes which are inhalable and able to make it into the lower airway, but in this study, and others (Pauly et al., 1998; Amato Lourenço et al., 2021) particles bigger than these are being reported, and therefore, it may be time to revisit these numbers and investigate what sizes can be inhaled. Interestingly, even after LOD and LOQ were applied, the PP identified in sample 1.1 was above the size limit which is generally thought of as inhalable.

12 MPs $\leq 10 \mu\text{m}$ were identified within 7 of the 13 lung tissue samples, consisting of PET (3), resin (3), PE (2), PP (2), PTFE (1) and PAN (1) (Table 1). The smallest particle identified was $14 \mu\text{m}$ in length and $4 \mu\text{m}$ width (Fig. 2C), and identified as an 'alkyd resin', a synthetic thermoplastic used in protective coatings and paints (Polymer Properties Database, n.d.). No MPs $\leq 10 \mu\text{m}$ were detected within blanks, surprising since the prevalence of MPs in the environment is known to increase with decreasing particle size (Allen et al., 2019; Dris et al., 2017; Cai et al., 2017), suggesting that the quality assurance measures undertaken eliminated these smaller particles from blanks. As these small MPs were consistently absent from blanks (Fig. 3B), it highlights the likelihood of the

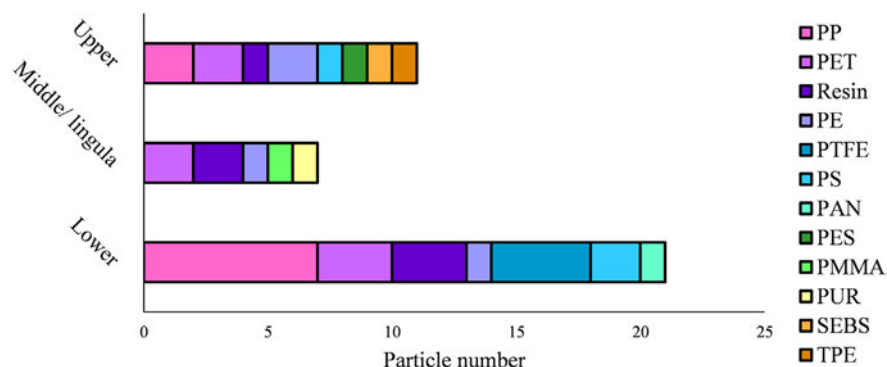


Fig. 4. Particle number (total MPs detected with no account taken for MPs found in controls) and polymer type of MPs identified within human lung tissue samples, assigned to their lung region.

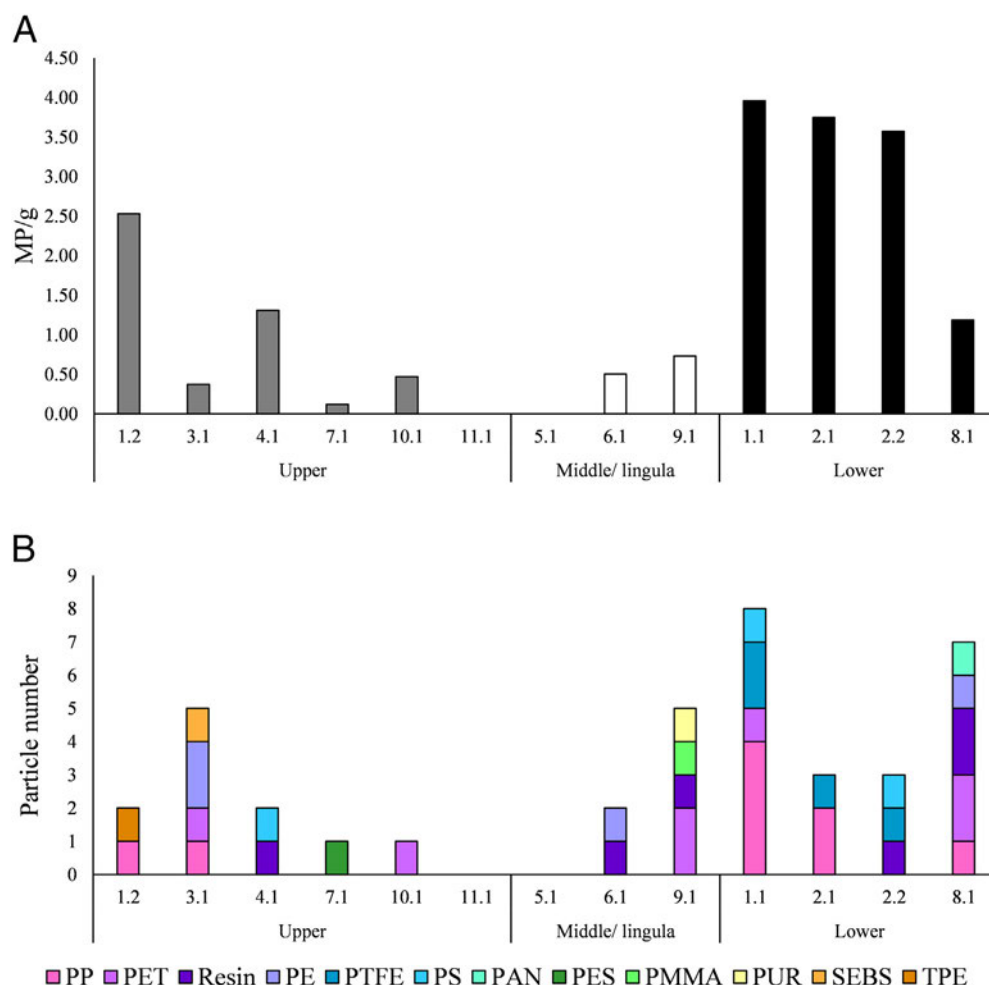


Fig. 5. Number (A) and type/quantity (B) of MPs detected in each lung region for individual patients.

smaller MPs being present within lung tissue rather than from background contamination sources.

The ubiquity of MPs within the environment, results in background contamination in any study, even after strict quality control measures are applied. Blanks, or controls, are run alongside sample analysis to document the levels and types of MPs contaminating samples, either by mimicking the sample processing steps ('procedural blank'), or by opening a clean filter during sample analysis ('laboratory blank'). Rarely are procedural and laboratory blanks both applied (Brander et al., 2020). It was hypothesised in the design of this study that if MPs were present within lung tissue samples, they would be present at low levels, especially considering the detection limit of chemical verification. Thus, the importance of combining multiple procedural and laboratory blanks, is highlighted. In this study the MP characteristics identified within blanks were distinct from those identified within lung tissue samples; the main polymer abundance, size range and shape varied (Fig. 3A, B). Human lung tissue samples were typically comprised of PP, PET and resin, with lengths ranging from 12 to 2475 μm and widths from 4 to 88 μm , and fibres being more prevalent than fragments. In contrast, MPs detected in the blanks were less abundant and comprised different particle characteristics. MPs were sized 23–315 μm and 15–73 μm for length and width, and fragments were more prevalent than fibres.

Within the MP literature, a standardised contamination adjustment technique has not been established. Therefore, this study opted to report concentrations in three commonly used ways; detailing blank results but making no adjustments (Zhang et al., 2020; Liu et al., 2019b), subtraction adjustments (Allen et al., 2019; Gaston et al., 2020) and LOD LOQ adjustments (Jenner et al., 2021; Horton et al., 2021). Using no contamination

adjustments, 1.42 ± 1.50 MP/g of lung tissue was observed. While this method is common practice, it likely includes any contamination within the samples. The subtraction adjustment decreases the lung tissue MP final mean value to 0.69 ± 0.84 MP/g and accounts for any potential background contamination but is not specific in terms of taking into account particle characteristics. The LOD LOQ adjustment approach dramatically reduces the levels of MPs identified within the study to 0.15 ± 0.54 MP/g using a polymer specific approach, but could be seen to 'mask' low levels of MPs. Ultimately this study highlights the need for data adjustments to account for background contamination, but alongside an evaluation into which adjustment is the best approach. Irrespective of the adjustments, low levels of MPs are present within lung tissue samples, providing evidence to support MP inhalation as a route of exposure to humans.

Airborne MPs are globally ubiquitous and especially prevalent indoors where humans spend many hours a day, such as the home (Dris et al., 2017; Jenner et al., 2021; Vianello et al., 2019; Zhang et al., 2020) and the office (Dris et al., 2017; Zhang et al., 2020). Humans are thus continuously exposed to atmospheric MPs, with inhalation estimates ranging from 6 to 272 MP/day (Vianello et al., 2019; Prata, 2018; Domenech and Marcos, 2021). It is the smallest and least dense MP and NP particles that are the most cause for concern regarding respiratory health, as these MPs are most likely to deposit within the lungs based on aerodynamic diameter (Prata, 2018). In contrast to NPs, MP particles in the full micro size range (10 μm –5 mm) have yet to be considered in terms of health implications and potential impacts, perhaps not having been a priority compared with the smaller, ultrafine particles. The results herein indicate that the larger micro size range is detected within human lung samples, suggesting that these have been overlooked (as being considered too large to enter

lungs). MPs, like all macroplastics, are designed to be resilient, with the addition of dyes, and additives that dictate their properties (GESAMP, 2015). It had previously been suggested that inhaled MPs are likely to bio persist and possibly accumulate within a lung environment (Wright and Kelly, 2017), showing resilience to degradation by synthetic extracellular lung fluid after 180 days (Law et al., 1990). After deposition within the lung, mechanisms of toxicity are unknown but particle properties such as small size, density, concentration, shape, monomer type, chemical leachates and environmental adsorbents (e.g. bacteria, heavy metals and polyaromatic hydrocarbons) have all been suggested as potential contributors to cytotoxicity (Prata, 2018; Wright and Kelly, 2017). Inflammation (Porter et al., 1999), ROS and oxidative stress (Schirizzi et al., 2017), physical damage from particle shape, frustrated phagocytosis (Donaldson et al., 1993), are currently suggested cellular responses to MP exposure.

In summary, this study is the first to report MPs within human lung tissue samples, using μ FTIR spectroscopy. The abundance of MPs within samples, significantly above that of blanks, supports human inhalation as a route of environmental exposure. MPs with dimensions as small as 4 μ m but also, surprisingly, >2 mm were identified within all lung region samples, with the majority being fibrous and fragmented. The knowledge that MPs are present in human lung tissues can now direct future cytotoxicity research to investigate any health implications associated with MP inhalation.

CRedit authorship contribution statement

Lauren C. Jenner: Conceptualization, Investigation, Methodology, Formal analysis, Writing original draft, Writing review & editing, Visualization. **Jeanette M. Rotchell:** Conceptualization, Formal analysis, Writing original draft, Writing review & editing, Supervision. **Robert T. Bennett:** Resources, Writing review & editing. **Michael Cowen:** Resources, Writing review & editing. **Laura R. Sadofsky:** Conceptualization, Formal analysis, Writing original draft, Writing review & editing, Supervision.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.scitotenv.2022.154907>.

References

Allen, S., Allen, D., Phoenix, V., et al., 2019. Atmospheric transport and deposition of microplastics in a remote mountain catchment. *Nat. Geosci.* 12, 339–344.

Amato-Lourenço, L.F., Carvalho-Oliveira, R., Júnior, G.R., et al., 2021. Presence of airborne microplastics in human lung tissue. *J. Hazard. Mater.* 416, 126124.

Brander, S.M., Renick, V.C., Foley, M.M., et al., 2020. Sampling and quality assurance and quality control: a guide for scientists investigating the occurrence of microplastics across matrices. *Appl. Spectrosc.* 74, 1099–1125.

Cai, L., Wang, J., Peng, J., et al., 2017. Characteristic of microplastics in the atmospheric fallout from Dongguan City, China: preliminary research and first evidence. *Environ. Sci. Pollut. Res.* 24, 24928–24935.

Cowger, W., Booth, A.M., Hamilton, B.M., et al., 2020. Reporting guidelines to increase the reproducibility and comparability of research on microplastics. *Appl. Spectrosc.* 74, 1066–1077.

Danopoulos, E., Twiddy, M., Rotchell, J.M., 2020. Microplastic contamination of drinking water: a systematic review. *PLoS ONE* 15, e0236838.

Danopoulos, E., Jenner, L.C., Twiddy, M., et al., 2020. Microplastic contamination of seafood intended for human consumption: a systematic review and meta-analysis. *Environ. Health Perspect.* 128, 126002-1–126002-32.

Domenech, J., Marcos, R., 2021. Pathways of human exposure to microplastics, and estimation of the total burden. *Curr. Opin. Food Sci.* 39, 144–151.

Dominelli, P.B., Ripoll, J.G., Cross, T.J., Baker, S.E., Wiggins, C.C., Welch, B.T., Joyner, M.J., 2018. Sex differences in large conducting airway anatomy. *J. Appl. Physiol.* 125, 960–965.

Donaldson, K., Brown, R.C., Brown, G.M., 1993. Respirable industrial fibres: mechanisms of pathogenicity. *Thorax* 48, 390–395.

Dris, R., Gasperi, J., Mirande, C., et al., 2017. A first overview of textile fibers, including microplastics, in indoor and outdoor environments. *Environ. Pollut.* 221, 453–458.

Eriksen, M., Mason, S., Wilson, S., et al., 2013. Microplastic pollution in the surface waters of the Laurentian Great Lakes. *Mar. Pollut. Bull.* 77, 177–182.

Free, C.M., Jensen, O.P., Mason, S.A., et al., 2014. High-levels of microplastic pollution in a large, remote, mountain lake. *Mar. Pollut. Bull.* 85, 156–163.

Gaston, E., Woo, M., Steele, C., et al., 2020. Microplastics differ between indoor and outdoor air masses: insights from multiple microscopy methodologies. *Appl. Spectrosc.* 74, 1079–1098.

GESAMP, 2015. Sources, Fate and Effects of Microplastics in the Marine Environment: A Global Assessment. 40. The Joint Group of Experts on Scientific Aspects of Marine Environmental Protection, Working Group, London UK.

Hartmann, N.B., Hüffer, T., Thompson, R.C., et al., 2019. Are we speaking the same language? Recommendations for a definition and categorization framework for plastic debris. *Environ. Sci. Technol.* 53, 1039–1047.

Hidalgo-Ruz, V., Gutov, L., Thompson, R.C., et al., 2012. Microplastics in the marine environment: a review of the methods used for identification and quantification. *Environ. Sci. Technol.* 46, 3060–3075.

Horsfield, K., Dart, G., Olson, D.E., et al., 1971. Models of the human bronchial tree. *J. Appl. Physiol.* 31, 207–217.

Horton, A.A., Cross, R.K., Read, D.S., et al., 2021. Semi-automated analysis of microplastics in complex wastewater samples. *Environ. Pollut.* 268, 115841.

Jenner, L.C., Sadofsky, L.R., Danopoulos, E., et al., 2021. Household indoor microplastics within the Humber region (United Kingdom): quantification and chemical characterisation of particles present. *Atmos. Environ.* 259, 118512.

Jenner, L.C., Sadofsky, L.R., Danopoulos, E., Chapman, E., White, D., Jenkins, R.L., et al., 2022. Outdoor atmospheric microplastics within the Humber region (United Kingdom): quantification and chemical characterisation of deposited particles present. *Atmosphere* 13, 265.

Kreyling, W.G., Semmler-Behnke, M., Möller, W., 2006. Ultrafine particle-lung interactions: does size matter? *J. Aerosol Med.* 19, 74–83.

Law, B.D., Bunn, W.B., Hesterberg, T.W., 1990. Solubility of polymeric organic fibers and manmade vitreous fibers in gambles solution. *Inhal. Toxicol.* 2, 321–339.

Li, Y., Shao, L., Wang, W., et al., 2020. Airborne fiber particles: types, size and concentration observed in Beijing. *Sci. Total Environ.* 705, 135967.

Liu, K., Wang, X., Fang, T., et al., 2019. Source and potential risk assessment of suspended atmospheric microplastics in Shanghai. *Sci. Total Environ.* 675, 462–471.

Liu, K., Wang, X., Wei, N., et al., 2019. Accurate quantification and transport estimation of suspended atmospheric microplastics in megacities: implications for human health. *Environ. Int.* 132, 105127.

Munno, K., Helm, P.A., Jackson, D.A., et al., 2018. Impacts of temperature and selected chemical digestion methods on microplastic particles. *Environ. Toxicol. Chem.* 37, 91–98.

Oberdorster, G., Ferin, J., Lehnert, B.E., 1994. Correlation between particle size, in vivo particle persistence, and lung injury. *Environ. Health Perspect.* 102, 173–179.

Pauly, J.L., Stegmeier, S.J., Allaart, H.A., et al., 1998. Inhaled cellulosic and plastic fibers found in human lung tissue. *Cancer Epidemiol. Biomark. Prev.* 7, 419–428.

Polymer Properties Database. Alkyd Resins <https://polymerdatabase.com/polymer%20classes/Alkyd%20Resin.html> Date last accessed: Jul 2021.

Porter, D.W., Castranova, V., Robinson, V.A., et al., 1999. Acute inflammatory reaction in rats after intratracheal instillation of material collected from a nylon flocking plant. *J. Toxicol. Environ. Health Part A* 57, 25–45.

Prata, J.C., 2018. Airborne microplastics: consequences to human health? *Environ. Pollut.* 234, 115–126.

Prata, J.C., da Costa, J.P., Lopes, I., et al., 2020. Environmental exposure to microplastics: an overview on possible human health effects. *Sci. Total Environ.* 702, 134455.

Primpke, S., Wirth, M., Lorenz, C., Gerds, G., 2018. Reference database design for the automated analysis of microplastic samples based on Fourier transform infrared (FTIR). *Anal. Bioanal. Chem.* 410, 5131–5141.

Ragusa, A., Svelato, A., Santacroce, C., et al., 2021. Plasticenta: first evidence of microplastics in human placenta. *Environ. Int.* 146, 106274.

Schirizzi, G.F., Pérez-Pomeda, I., Sanchis, J., et al., 2017. Cytotoxic effects of commonly used nanomaterials and microplastics on cerebral and epithelial human cells. *Environ. Res.* 159, 579–587.

Silva, A.B., Bastos, A.S., Justino, C.I.L., da Costa, J.P., Duarte, A.C., Rocha-Santos, T.A.P., 2018. Microplastics in the environment: challenges in analytical chemistry - a review. *Anal. Chim. Acta* 1017, 1–19.

Veerasingam, S., Ranjani, M., Venkatachalapathy, R., et al., 2021. Contributions of Fourier transform infrared spectroscopy in microplastic pollution research: a review. *Crit. Rev. Environ.* 51, 2681–2743.

Vianello, A., Jensen, R., Liu, L., et al., 2019. Simulating human exposure to indoor airborne microplastics using a breathing thermal manikin. *Sci. Rep.* 9, 8670.

- Wang, J., Liu, X., Li, Y., et al., 2019. Microplastics as contaminants in the soil environment: a mini-review. *Sci. Total Environ.* 691, 848–857.
- Wesch, C., Elert, A.M., Wörner, M., et al., 2017. Assuring quality in microplastic monitoring: about the value of clean-air devices as essentials for verified data. *Sci. Rep.* 7, 1–8.
- Wright, S., Levermore, J., Kelly, F., 2019. Raman spectral imaging for the detection of inhalable microplastics in ambient particulate matter samples. *Environ. Sci. Technol.* 53, 8947–8956.
- Wright, S.L., Kelly, F.J., 2017. Plastic and human health: a micro issue? *Environ. Sci. Technol.* 51, 6634–6647.
- Wright, S.L., Ulke, J., Font, A., et al., 2019. Atmospheric microplastic deposition in an urban environment and an evaluation of transport. *Environ. Int.* 136, 105411.
- Zhang, Q., Zhao, Y., Du, F., et al., 2020. Microplastic fallout in different indoor environments. *Environ. Sci. Technol.* 54, 6530–6539.

MASK-INEFFECTIVENESS	
1) Effectiveness of Adding a Mask Recommendation to Other Public Health Measures to Prevent SARS-CoV-2 Infection in Danish Mask Wearers, Bundgaard, 2021	“Infection with SARS-CoV-2 occurred in 42 participants and 53 control participants (2.1%). The between-point (95% CI, -1.2 to 0.4 percentage point; P = 0.1.23]; P = 0.33). Multiple imputation accounting for missing results...the recommendation to wear surgical masks and other public health measures did not reduce the SARS-CoV-2 infection rate more than 50% in a community with modest infection control measures, social distancing, and uncommon general mask use.”
2) SARS-CoV-2 Transmission among Marine Recruits during Quarantine, Letizia, 2020	“Our study showed that in a group of predominantly male recruits, approximately 2% became positive for SARS-CoV-2 during a 2-week, strictly enforced quarantine. Multiple transmission clusters were identified...all recruits wore masks all times indoors and outdoors.”
3) Physical interventions to interrupt or reduce the spread of respiratory viruses, Jefferson, 2020	“There is low certainty evidence from nine trials that wearing a mask may make little or no difference to the outcome of laboratory-confirmed infection compared to not wearing a mask (risk ratio (RR) 0.91, 95% CI 0.66 to 1.26; P = 0.61) to 1.18. There is moderate certainty evidence that wearing a mask may make little or no difference to the outcome of laboratory-confirmed infection compared to not wearing a mask (RR 0.91, 95% CI 0.66 to 1.26; P = 0.61). The pooled results of randomised trials did not show a significant difference in infection with the use of medical/surgical masks compared to no mask use.”
4) The Impact of Community Masking on COVID-19: A Cluster-Randomized Trial in Bangladesh, Abaluck, 2021 Heneghan et al.	A cluster-randomized trial of community-level masking in Bangladesh from November 2020 to April 2021 (N=600 villages). “In a Bangladesh study , surgical masks reduced the risk of COVID-19 infection between 0 and 22 percent, while the efficacy of cloth masks increased from an 11 percent increase to a 21 percent decrease. In other studies, adult masks appear to have either no or small effects on infection rates.”
5) Evidence for Community Cloth Face Masking to Limit the Spread of SARS-CoV-2: A Critical Review, Liu/CATO, 2021	“The available clinical evidence of facemask efficacy to reduce the spread of SARS-CoV-2. The available clinical evidence has mostly failed to show a statistically significant benefit in the 16 identified randomized controlled trials comparing mask use to no mask use, failing to find statistically significant benefit in the 16 identified randomized controlled trials, sixteen quantitative meta-analyses, eight were excluded. The available evidence supports a public recommendation of no mask use. The available evidence does not support a public mask intervention on limited grounds of the precautionary principle.”

<p>6) Nonpharmaceutical Measures for Pandemic Influenza in Nonhealthcare Settings—Personal Protective and Environmental Measures, CDC/Xiao, 2020</p>	<p>“Evidence from 14 randomized controlled trials of a substantial effect on transmission of laboratory-confirmed influenza in household studies reported a significant reduction in influenza virus infections in the face mask group. In laboratory-confirmed influenza cases in the face mask group, either studies.”</p>
<p>7) CIDRAP: Masks-for-all for COVID-19 not based on sound data, Brosseau, 2020</p>	<p>“We agree that the data supporting the effectiveness of masks are very limited. We do, however, have data from household studies that masks or face coverings offer very low filter collection efficiency for inhalable particles we believe are largely responsible for transmission from pre- or asymptomatic individuals who are not symptomatic. To support mask wearing by the general public, we believe that masks and face coverings are likely to have limited impact on reducing transmission, because they have minimal ability to filter out small particles, offer limited personal protection with no ventilation, and should not be recommended as a replacement for social distancing time in enclosed spaces with many potentially infectious individuals.”</p>
<p>8) Universal Masking in Hospitals in the Covid-19 Era, Klompas/NEJM, 2020</p>	<p>“We know that wearing a mask outside health care settings provides protection from infection. Public health authorities have recommended Covid-19 as face-to-face contact within 6 feet with an individual with Covid-19 that is sustained for at least a few minutes (and even 30 minutes). The chance of catching Covid-19 in public space is therefore minimal. In many cases, universal masking is a reflexive reaction to anxiety over the pandemic. However, in health care settings. First and foremost, use of personal protective equipment (PPE) by clinicians and staff caring for patients with respiratory viral infections, in conjunction with other infection control measures...universal masking alone is not a panacea. Health care providers caring for a patient with active Covid-19 must use meticulous hand hygiene, eye protection, gloves, and other measures to prevent health care workers with early Covid-19 from spreading the virus to patients and colleagues. Failure to do so may, paradoxically, lead to more transmission of the virus. Implementing more fundamental infection-control measures is essential.”</p>
<p>9) Masks for prevention of viral respiratory infections among health care workers and the public: PEER umbrella systematic review, Dugré, 2020</p>	<p>“This systematic review found limited evidence to support the use of masks to reduce the risk of viral respiratory infections. In the community, universal masking for influenza-like illness was found among mask users. In health care settings, we show no difference between N95 masks and surgical masks for preventing influenza or other confirmed viral respiratory infections.”</p>

	from N95 masks were found for preventing influenza and other respiratory infections. Surgical masks might be superior, but limited to 1 trial.”
10) Effectiveness of personal protective measures in reducing pandemic influenza transmission: A systematic review and meta-analysis, Saunders-Hastings, 2017	“Facemask use provided a non-significant protection (OR 1.71; I ² = 48%) against 2009 pandemic influenza infection.”
11) Experimental investigation of indoor aerosol dispersion and accumulation in the context of COVID-19: Effects of masks and ventilation, Shah, 2021	“Nevertheless, high-efficiency masks, such as the N95, with apparent filtration efficiencies (60% and 46% for cloth and surgical masks, respectively) are still the recommended choice in mitigating airborne transmission.”
12) Exercise with facemask; Are we handling a devil’s sword?- A physiological hypothesis, Chandrasekaran, 2020	“Exercising with facemasks may reduce available oxygen, preventing substantial carbon dioxide exchange. This may potentially increase acidic environment, cardiac workload, and renal overload, which may substantially aggravate pre-existing chronic diseases. Further contrary to the common belief exists to claim the facemasks during exercise offer no protection against droplet transfer of the virus.”
13) Surgical face masks in modern operating rooms—a costly and unnecessary ritual?, Mitchell, 1991	“Following the commissioning of a new suite of operating rooms, we showed a flow of air away from the operating table. Oral microbial flora dispersed by unmasked male staff 1 metre from the table failed to contaminate exposed surfaces. The wearing of face masks by non-scrubbed staff in the operating room forced ventilation seems to be unnecessary.”
14) Facemask against viral respiratory infections among Hajj pilgrims: A challenging cluster-randomized trial, Alfelali, 2020	“By intention-to-treat analysis, facemask use did not reduce laboratory-confirmed viral respiratory infections (OR 1.0, 95% CI, 0.9 to 2.1, p = 0.18) nor against clinical illness (OR 1.0, 95% CI, 0.9 to 1.4, p = 0.40).”
15) Simple respiratory protection—evaluation of the filtration performance of cloth masks and common fabric materials against 20-1000 nm size particles, Rengasamy, 2010	“Results obtained in the study show that common cloth masks provide marginal protection against nanoparticles including 20-1000 nm size containing particles in exhaled breath.”
16) Respiratory performance offered by N95 respirators and surgical masks: human subject evaluation with NaCl aerosol representing bacterial and viral particle size range, Lee, 2008	“The study indicates that N95 filtering facepiece respirators provide the expected protection level against bacteria and viruses. A surgical respirator does not affect the respiratory protection level. A surgical alternative to reduce the breathing resistance.”

17) Aerosol penetration and leakage characteristics of masks used in the health care industry, Weber, 1993	“We conclude that the protection provided by surgical masks in health care environments containing potentially hazardous substances is adequate.”
18) Disposable surgical face masks for preventing surgical wound infection in clean surgery, Vincent, 2016	“We included three trials, involving a total of 210 patients. There was no statistically significant difference in infection rates between the masked and unmasked group in any of the trials...from the limited evidence, the wearing of surgical face masks by members of the health care team does not reduce surgical wound infection rates for patients undergoing clean surgery.”
19) Disposable surgical face masks: a systematic review, Lipp, 2005	“From the limited results it is unclear whether wearing surgical masks causes any harm or benefit to the patient undergoing clean surgery.”
20) Comparison of the Filter Efficiency of Medical Nonwoven Fabrics against Three Different Microbe Aerosols, Shimasaki, 2018	“We conclude that the filter efficiency test using surrogate particles may overestimate the protective performance of nonwoven fabrics compared to that against real pathogens such as bacteria and viruses.”
21) The use of masks and respirators to prevent transmission of influenza: a systematic review of the scientific evidence 21) The use of masks and respirators to prevent transmission of influenza: a systematic review of the scientific evidence, Bin-Reza, 2012	The use of masks and respirators to prevent transmission of influenza: a review of the scientific evidence “None of the studies found a significant relationship between mask/respirator use and prevention of influenza. Some evidence suggests that mask use is best used in combination with other personal protection especially hand hygiene.”
22) Facial protection for healthcare workers during pandemics: a scoping review, Godoy, 2020	“Compared with surgical masks, N95 respirators may provide superior protection in inpatient settings but not in outpatient settings. Surgical mask and N95 respirator use should be extended use, reuse or decontamination, but the evidence is limited. Limited evidence suggests that reuse of N95 respirators may be used when medical-grade protection is unavailable.”
23) Assessment of Proficiency of N95 Mask Donning Among the General Public in Singapore, Yeung, 2020	“These findings support ongoing recommendations for the general public during the COVID-19 pandemic. However, the results may not translate into effective protection but in the future, the use of N95 masks, proficiency among the general public, and the need to be assessed.”
24) Evaluating the efficacy of cloth facemasks in reducing particulate matter exposure, Shakya, 2017	“Standard N95 mask performance was used as a benchmark for cloth masks, and our results suggest that cloth masks may protect individuals from particles <2.5 µm.”
25) Use of surgical face masks to reduce the incidence of the common cold among health care workers in Japan: a randomized controlled trial, Jacobs, 2009	“Face mask use in health care workers has not been shown to be effective in terms of cold symptoms or getting colds.”

26) N95 Respirators vs Medical Masks for Preventing Influenza Among Health Care Personnel, Radonovich, 2019	“Among outpatient health care personnel, N95 respirators by participants in this trial resulted in no significant reduction in laboratory-confirmed influenza.”
27) Does Universal Mask Wearing Decrease or Increase the Spread of COVID-19?, Watts up with that? 2020	“A survey of peer-reviewed studies shows that universal mask wearing (in specific settings) does not decrease the spread of viruses from people wearing masks to people who are not wearing masks.”
28) Masking: A Careful Review of the Evidence, Alexander, 2021	“In fact, it is not unreasonable at this time to conclude that masks used as they currently are, have absolutely no impact on the spread of Covid-19 virus, and current evidence implies that masks are harmful.”
29) Community and Close Contact Exposures Associated with COVID-19 Among Symptomatic Adults ≥18 Years in 11 Outpatient Health Care Facilities — United States, July 2020, Fisher, 2020	Reported characteristics of symptomatic adults ≥18 years in US academic health care facilities and who received a PCR test results (N = 314)* — United States, July 1–29, 2020: 95% of persons wore face masks almost all or most of the time .
30) Impact of non-pharmaceutical interventions against COVID-19 in Europe: a quasi-experimental study, Hunter, 2020	Face masks in public was not associated with reduced transmission.
31) Masking lack of evidence with politics, CEBM, Heneghan, 2020	“It would appear that despite two decades of public health advice, considerable uncertainty as to the value of wearing masks against infection with cloth masks could be due to harms from wearing medical masks. The numerous systematic reviews published to date all include the same evidence base so unsurprisingly reach the same conclusions.”
32) Transmission of COVID-19 in 282 clusters in Catalonia, Spain: a cohort study, Marks, 2021	“We observed no association of risk of transmission with close contacts, with the age or sex of the index case, or with symptoms in the index case at the initial study visit.”
33) Non-pharmaceutical public health measures for mitigating the risk and impact of epidemic and pandemic influenza, WHO, 2020	“Ten RCTs were included in the meta-analysis, and the results suggest that masks are effective in reducing transmission of influenza.”
34) The Strangely Unscientific Masking of America, Younes, 2020	“One report reached its conclusion based on observations to a breathing simulator. ” Another analyzed use of masks by people experiencing at least two symptoms of acute respiratory infection. of these studies involved cloth masks or accounted for mask misuse (misusage) among lay people, and none established a link between wearing by people not exhibiting symptoms. The

	whatsoever that healthy people ought to wear masks, especially outdoors.”
35) Facemasks and similar barriers to prevent respiratory illness such as COVID-19: A rapid systematic review, Brainard, 2020	“31 eligible studies (including 12 RCTs). Narrative analysis of attack rates for primary and secondary infection performed. Based on the RCTs we would conclude that facemasks are slightly protective against primary infection from community members wear facemasks. However, the RCTs of household members and controls using facemasks.”
36) The Year of Disguises, Koops, 2020	“The healthy people in our society should not be required to wear exactly what lockdowns, distancing, mask mandates, and wearing face coverings. We all need constant interaction with the world that is especially true for children. This is how the world works. The lowest of the low-risk groups. Let them be kids. Let them be in systems... The “Mask Mandate” idea is a truly ridiculous idea that to be withdrawn and thrown in the waste bin of coronavirus lockdowns and school closures. You can vote for it. You can vote for all of their proposals!”
37) Open Schools, Covid-19, and Child and Teacher Morbidity in Sweden, Ludvigsson, 2020	“1,951,905 children in Sweden (as of December 31, 2019) were examined...social distancing was encouraged...No child with Covid-19 died.”
38) Double-Masking Benefits Are Limited, Japan Supercomputer Finds, Reidy, 2021	“Wearing two masks offers limited benefits in preventing the spread of the coronavirus compared to one well-fitted mask. A Japanese study that modeled the dispersal of coronavirus particles found that wearing two masks only reduced the risk of infection by a small amount.”
39) Physical interventions to interrupt or reduce the spread of respiratory viruses. Part 1 – Face masks, eye protection and person distancing: systematic review and meta-analysis, Jefferson, 2020	“There was insufficient evidence to provide a recommendation for the use of barriers without other measures. We found insufficient evidence for the effectiveness of surgical masks and N95 respirators and for the effectiveness of quarantine.”
40) Should individuals in the community without respiratory symptoms wear facemasks to reduce the spread of COVID-19?, NIPH, 2020	“Non-medical facemasks include a variety of products. The effectiveness of non-medical facemasks in community settings varies. There is substantial variation in effectiveness between products. Evidence from laboratory studies of potential differences in effectiveness of different products are used in the community.”
41) Is a mask necessary in the operating theatre?, Orr, 1981	“It would appear that minimum contamination control requires the use of a mask at all but operating in silence. Whatever its use, the mask should be worn at all times.”

	counts, or the dissemination of squames, there is of masks reduces wound infection.”
42) The surgical mask is a bad fit for risk reduction, Neilson, 2016	“As recently as 2010, the US National Academy of community setting, “face masks are not designed from exposure to respiratory hazards.” A number of the surgical mask in household settings to prevent virus.”
43) Facemask versus No Facemask in Preventing Viral Respiratory Infections During Hajj: A Cluster Randomised Open Label Trial, Alfelali, 2019	“Facemask use does not prevent clinical or laboratory infections among Hajj pilgrims.”
44) Facemasks in the COVID-19 era: A health hypothesis, Vainshelboim, 2021	“The existing scientific evidences challenge the surgical facemask as preventive intervention for COVID-19 and non-medical facemasks are ineffective to block viral and infectious disease such SARS-CoV-2 and usage of facemasks. Wearing facemasks has been adverse physiological and psychological effects. shortness of breath, increased acidity and toxicity response, rise in stress hormones, immunosuppression cognitive performance, predisposition for viral and anxiety and depression.”
45) The use of masks and respirators to prevent transmission of influenza: a systematic review of the scientific evidence, Bin-Reza, 2011	“None of the studies established a conclusive relationship use and protection against influenza infection. So is best undertaken as part of a package of personal hygiene.”
46) Are Face Masks Effective? The Evidence., Swiss Policy Research, 2021	“Most studies found little to no evidence for the effect general population, neither as personal protective
47) Postoperative wound infections and surgical face masks: A controlled study, Tunevall, 1991	“These results indicate that the use of face masks can be used to protect the operating team from dropping infections, but have not been proven to protect the operating team.”
48) Mask mandate and use efficacy in state-level COVID-19 containment, Guerra, 2021	“Mask mandates and use are not associated with during COVID-19 growth surges.”
49) Twenty Reasons Mandatory Face Masks are Unsafe, Ineffective and Immoral, Manley, 2021	“A CDC-funded review on masking in May 2020 can mechanistic studies support the potential effect evidence from 14 randomized controlled trials of

	substantial effect on transmission of laboratory- and household studies reported a significant reduction in influenza virus infections in the face mask group. how can they stop SAR-CoV-2?"
50) A cluster randomised trial of cloth masks compared with medical masks in healthcare workers, MacIntyre, 2015	"First RCT of cloth masks, and the results caution an important finding to inform occupational health. reuse of cloth masks and poor filtration may result in rates of all infection outcomes were highest in the cloth mask group (RR=1.69 to 100.07) compared with the medical mask group. significantly higher rates of ILI compared with the medical masks group (RR=6.64, 95% CI 1.45 to 28.65) and lower rates of ILI (RR=0.16, 95% CI 0.01 to 2.94) were significantly higher in the cloth mask group. Penetration of cloth masks was 44%."
51) Horowitz: Data from India continues to blow up the 'Delta' fear narrative, Blazemedia, 2021	"Rather than proving the need to sow more panic, the story from India — the source of the "Delta" variant — is a premise of COVID fascism...Masks failed to stop t
52) An outbreak caused by the SARS-CoV-2 Delta variant (B.1.617.2) in a secondary care hospital in Finland, May 2021, Hetemäki, 2021	Reporting on a nosocomial hospital outbreak in Finland, "both symptomatic and asymptomatic infections occurred among healthcare workers, and secondary transmission occurred among patients despite use of personal protective equipment."
53) Nosocomial outbreak caused by the SARS-CoV-2 Delta variant in a highly vaccinated population, Israel, July 2021, Shitrit, 2021	In a hospital outbreak investigation in Israel, Shitrit et al. reported the transmissibility of the SARS-CoV-2 Delta variant among individuals." They added that "this suggests some protection provided by masks for individuals without comprehensive personal protective equipment."
54) 47 studies confirm ineffectiveness of masks for COVID and 32 more confirm their negative health effects, Lifesite news staff, 2021	"No studies were needed to justify this practice since the evidence was too small to be stopped by the wearing of most masks not designed for that task and which were too costly for the public to properly wear and keep changing or cleaning. Long mask wearing was unhealthy for wearers for many reasons."
55) Are EUA Face Masks Effective in Slowing the Spread of a Viral Infection?, Dopp, 2021	The vast evidence shows that masks are ineffective

56) CDC Study finds overwhelming majority of people getting coronavirus wore masks, Boyd/Federalist, 2021	“A Centers for Disease Control report released in face coverings are not effective in preventing the people who consistently wear them.”
57) Most Mask Studies Are Garbage , Eugypius, 2021	“The other kind of study, the proper kind, would compare the rates of infection in a masked cohort unmasked cohort. Here things have gone much, spent months trying to prevent the publication of trial , which found that masks do zero. When that they spent more months trying desperately to po boundless relief when the Bangladesh study fina September. Every last Twitter blue-check could r Masks Work. Such was their hunger for any scrap convictions, that none of them noticed the sad n study found a mere 10% reduction in seroprevalence effect so small that it fell within the confidence in couldn’t exclude the possibility that masks in fac
58) Using face masks in the community: first update , ECDC, 2021	“No high-quality evidence in favor of face masks based on the ‘ precautionary principle .”
59) Do physical measures such as hand-washing or wearing masks stop or slow down the spread of respiratory viruses? , Cochrane, 2020	“Seven studies took place in the community, and Compared with wearing no mask, wearing a mas how many people caught a flu-like illness (9 stud no difference in how many people have flu confir 3005 people). Unwanted effects were rarely repo
60) Mouth-nose protection in public: No evidence of effectiveness , Thieme/ Kappstein, 2020	“The use of masks in public spaces is questionable scientific data. If one also considers the necessary considered a risk of infection in public spaces acc hospitals... If masks are worn by the population, increased, regardless of whether they are medica community masks designed in any way. If one co that the RKI as well as the international health au authorities would even have to inform the popul in public spaces at all. Because no matter whethe voluntarily borne by the citizens who want it for v masks can do more harm than good in public.”
61) US mask guidance for kids is the strictest across the world , Skelding, 2021	“Kids need to see faces,” Jay Bhattacharya, a pro University, told The Post. Youngsters watch peop and understand emotions, he said.“We have this

	we must adopt any means necessary to stop it from spreading. Mandates for masks in schools have no costs. They actually do
62) Masking young children in school harms language acquisition, Walsh, 2021	“This is important because children and/or students have a language ability that adults have — they are not fully developed. The face and especially the mouth is critical to language development. If students are engaged in at all times. Furthermore, masks are not only essential to communication but also essential to learning.”
63) The Case Against Masks for Children, Makary, 2021	“It’s abusive to force kids who struggle with them. It’s also abusive to force unvaccinated adults... Do masks reduce Covid transmission? If not, we could find only a single retrospective study that was inconclusive. Yet two weeks ago the Centers for Disease Control sternly decreed that 56 million U.S. children and adults should cover their faces regardless of the prevalence of the virus. Authorities in many places took the cue to impose mask mandates on the theory that masks can’t do any harm. That’s not true. Wearing a mask, but others struggle. Those who struggle because the mask fogs their glasses. (This has long been a problem for students in the operating room.) Masks can cause breathing problems. The discomfort of a mask distracts some students. Increasing airway resistance during exhalation, not inhaled carbon dioxide in the blood. And masks can be very uncomfortable if moist or are used for too long.”
64) Face Covering Mandates, Peavey, 2021	“Face Covering Mandates And Why They AREN’T Working”
65) Do masks work? A Review of the evidence, Anderson, 2021	“In truth, the CDC’s, U.K.’s, and WHO’s earlier guidance was based on the best medical research on masks’ effectiveness. That research suggests that Americans’ many masks provided little to no health benefit and might even have prevented the spread of the novel coronavirus.”
66) Most face masks won’t stop COVID-19 indoors, study warns, Anderer, 2021	“New research reveals that cloth masks filter just 10% of particles. People not wearing coverings that fit their face properly are at a much higher risk of infection.”
67) How face masks and lockdowns failed/the face mask folly in retrospect, Swiss Policy Research, 2021	“Mask mandates and lockdowns have had no discernible effect on the spread of the virus.”
68) CDC Releases School COVID Transmission Study But Buries One of the Most Damning Parts, Davis, 2021	“The 21% lower incidence in schools that require masks is statistically significant compared with schools without masks. Tens of millions of American kids headed back to school. Political leaders owe it to them to have a clear-sighted view of the evidence.”

	discussion about which anti-COVID measures act as an extra burden on vulnerable young people without slowing the spread of the virus...that a masking measure's independent benefit is a finding of consequence
69) World Health Organization internal meeting, COVID-19 – virtual press conference – 30 March 2020, 2020	"This is a question on Austria. The Austrian Government says wear a mask who's going into the shops. I understand from you that the general public should not wear masks. What do you say about the new Austrian measure? Is it a measure in Austria. I would assume that it's aimed at preventing disease not passing it to others. In general WHO recommends a mask by a member of the public is to prevent them from passing it to somebody else. We don't generally recommend that for otherwise well individuals because it has not been shown to have a particular benefit."
70) Face masks to prevent transmission of influenza virus: a systematic review, Cowling, 2010	"Review highlights the limited evidence base supporting the use of face masks to reduce influenza virus transmission. It showed a benefit from wearing a mask, in either community or in households (H)."
71) Effectiveness of N95 respirators versus surgical masks in protecting health care workers from acute respiratory infection: a systematic review and meta-analysis, Smith, 2016	"Although N95 respirators appeared to have a protective effect compared to surgical masks in laboratory settings, our meta-analysis was unable to determine definitively whether N95 respirators are superior in protecting health care workers against transmission in clinical settings."
72) Effectiveness of Masks and Respirators Against Respiratory Infections in Healthcare Workers: A Systematic Review and Meta-Analysis, Offeddu, 2017	"We found evidence to support universal medical masks as part of infection control measures to reduce the risk of transmission. Although N95 respirators may convey greater protection, their shift is likely to be less acceptable due to greater discomfort. Therefore, the effectiveness of medical masks and respirators suggests that paper masks are not recommended. The confidence interval is crucially important for lower-resource and emergency settings where respirators. In such cases, single-use medical masks are preferred, which there is no evidence of protection and which may increase the risk of pathogens when used repeatedly without adequate cleaning. There is no benefit of either medical masks or N95 respirators over single-use masks. Evidence to inform policies on mask use in HCWs is limited by observational studies that is prone to reporting biases and lack of randomised controlled trials."

73) N95 Respirators vs Medical Masks for Preventing Influenza Among Health Care Personnel, Radonovich, 2019	“Use of N95 respirators, compared with medical masks, resulted in no significant difference in the rates of influenza among health care personnel.”
Effectiveness of N95 respirators versus surgical masks against influenza: A systematic review and meta-analysis74) Masks Don’t Work: A Review of Science Relevant to COVID-19 Social Policy, Rancourt, 2020	The use of N95 respirators compared with surgical masks for preventing influenza in health care workers (HCWs) and the community. It suggests that the use of N95 respirators is not recommended for general public and nonhigh-risk contact with influenza patients or suspected patients. The outcome shows a benefit for HCW or community wearing a mask or respirator. There is no such study. There exists that shows a benefit from a broad policy to wear a mask (below). Furthermore, if there were any benefit to wearing a mask, it would be from blocking power against droplets and aerosol particles. The benefit from wearing a respirator (N95) compared with a surgical mask, as shown in meta-analyses, and all the RCT, prove that there is no benefit.
75) More Than a Dozen Credible Medical Studies Prove Face Masks Do Not Work Even In Hospitals!, Firstenberg, 2020	“Mandating masks has not kept death rates down. In fact, states that have never ordered people to wear face masks in health care facilities have lower COVID-19 death rates than the 30 states that have. In fact, no-mask states have COVID-19 death rates below 55. All 13 states that have a death rate higher than 55. All 13 states that have required the wearing of masks in health care facilities have a death rate higher than 55.”
76) Does evidence based medicine support the effectiveness of surgical facemasks in preventing postoperative wound infections in elective surgery?, Bahli, 2009	“From the limited randomized trials it is still not clear whether the use of face masks harms or benefit the patients undergoing surgery.”
77) Peritonitis prevention in CAPD: to mask or not?, Figueiredo, 2000	“The current study suggests that routine use of face masks may be unnecessary and could be discontinued.”
78) The operating room environment as affected by people and the surgical face mask, Ritter, 1975	“The wearing of a surgical face mask had no effect on the level of environmental contamination and probably worsened the level of talking and breathing. People are the major source of contamination in the operating room.”
79) The efficacy of standard surgical face masks: an investigation using “tracer particles, Ha’eri, 1980	“Particle contamination of the wound was demonstrated. Microspheres were not identified on the exterior of the mask. Particles escaped around the mask edges and found their way into the wound.”
80) Wearing of caps and masks not necessary during cardiac catheterization, Laslett, 1989	“Prospectively evaluated the experience of 504 patients undergoing heart catheterization, seeking evidence of a relationship between the use of masks and caps and the incidence of infection.”

	<p>masks were worn by the operators and the incidence was not found in any patient, regardless of whether a cap was worn. There is evidence that caps or masks need to be worn during catheterization.”</p>
<p>81) Do anaesthetists need to wear surgical masks in the operating theatre? A literature review with evidence-based recommendations, Skinner, 2001</p>	<p>“A questionnaire-based survey, undertaken by Leitch et al., on the use of masks, showed that 20% of surgeons wore masks during endoscopic work. Less than 50% did not wear the masks. The Medical Research Council. Equal numbers of surgeons were protecting themselves and the patient, with the patient's safety was the only reason for wearing them.”</p>
<p>82) Mask mandates for children are not backed by data, Faria, 2021</p>	<p>“Even if you want to use the 2018-19 flu season to gauge the impact of COVID-19 pandemic, the CDC paints a similar picture among children during that period, with 46,000 hospitalizations. It is simply not as deadly for children. According to preliminary data from 45 states show that between 2018 and 2019, cases resulted in death. When you combine these findings with the fact that mask mandates for students — along with classroom barriers — did not have a statistically significant impact on the spread of COVID-19 in schools, the insistence that children wear masks these hoops for their own protection makes no sense.”</p>
<p>83) The Downsides of Masking Young Students Are Real, Prasad, 2021</p>	<p>“The benefits of mask requirements in schools may help contain the coronavirus, right?—but that may not be true in kids ages 6 and older. The authors of one study found no spread at all ages. If masks provided a large benefit, the rate among 5-year-olds would be far higher than the rate among older children. show that. Instead, they show that transmission among the youngest kids, steadily increased with age—rather than being children subject to the face-covering requirements. If a school does not provide a major benefit and might even harm, officials prefer to double down on masking mandates. The science was sound and only the people have failed.”</p>
<p>84) Masks In Schools: Scientific American Fumbles Report On Childhood COVID Transmission, English/ACSH, 2021</p>	<p>“Masking is a low-risk, inexpensive intervention. It is a precautionary measure, especially in situations where the risk is great. But that’s not what the public has been told. Scientists and politicians in Texas say research does not support it. The headline bellowed. “Many studies show they are not effective.” It demonstrates that the intervention works before you can’t, acknowledged what UC San Francisco hem</p>

	<p>Professor of Epidemiology Vinay Prasad wrote over the summer that “no scientific consensus exists about the wisdom of mandatory mask wearing.” In mid-March 2020, few could argue against erring on the side of caution. Months later, we owe it to children and their parents to ask: Do the benefits of masking kids in school outweigh the costs? The answer in 2021 remains that we don’t know for sure.”</p>
<p>85) Masks ‘don’t work,’ are damaging health and are being used to control population: Doctors panel, Haynes, 2021</p>	<p>“The only randomized control studies that have concluded that masks don’t work,” began Dr. Nepute. He referred to a study in which Fauci “changed his tune,” from his March 2020 statement that masks downplayed the need and efficacy of mask wearing to his July statement that masks later in the year. “Well, he lied to us. So if he lied to you about?” questioned Nepute. Masks have been shown to work in every setting, whether indoors or outdoors, but Dr. Nepute has been “no studies” which actually examine the “effectiveness” of masks during waking hours. “There’s no science to back any of this up,” he said. “It’s just back the fact that wearing a mask twenty four-seven is a good idea,” promoting,” added Popper.”</p>
<p>86) Aerosol penetration through surgical masks, Chen, 1992</p>	<p>“The mask that has the highest collection efficiency is the one that has the highest efficiency from the perspective of the filter-quality factor, which is a function of both efficiency but also the air resistance. Although surgical masks are designed to remove bacteria exhaled or expelled by health care workers, they are not sufficient to remove the sub-micrometer-sized aerosols that are exhaled by these health care workers are potentially exposed to.”</p>
<p>87) CDC: Schools With Mask Mandates Didn’t See Statistically Significant Different Rates of COVID Transmission From Schools With Optional Policies, Miltimore, 2021</p>	<p>“The CDC did not include its finding that “required mask wearing was statistically significant compared with schools with optional policies,” in the summary of its report.”</p>
<p>88) Horowitz: Data from India continues to blow up the ‘Delta’ fear narrative, Howorwitz, 2021</p>	<p>“Rather than proving the need to sow more panic, the data from India — the source of the “Delta” variant — is a story from India — the source of the “Delta” variant — is a story from India — the source of the “Delta” variant...Unless we do that, we will have more lockdowns and masks. In reality, India’s experience with the Delta variant is: namely:1) Delta is largely an attenuated version, which is less deadly than the original virus, for most people is akin to a cold.2) Masks failed to prevent the spread of the virus. India has come close to the herd immunity threshold with its high vaccination rates.”</p>
<p>89) Transmission of SARS-CoV-2 Delta Variant Among Vaccinated Healthcare Workers, Vietnam, Chau, 2021</p>	<p>While not definitive in the LANCET publication, it is clear that all masked up and had PPE etc. as was the case in other countries during outbreaks, indicating the failure of PPE and masks to prevent transmission of the Delta variant.</p>

90) Aerosol penetration through surgical masks, Willeke, 1992	“The mask that has the highest collection efficiency is not the best from the perspective of the filter-quality factor, which is a balance of efficiency but also the air resistance. Although surgical masks are designed to remove bacteria exhaled or expelled by health care workers, they are not sufficient to remove the submicrometer-size aerosols that are inhaled by these health care workers who are potentially exposed to the aerosols.”
91) The efficacy of standard surgical face masks: an investigation using “tracer particles”, Wiley, 1980	“Particle contamination of the wound was demonstrated. Microspheres were not identified on the exterior of the mask. They escaped around the mask edges and found their way into the wound. The mask beneath the headgear curtails this route of contamination.”
92) An Evidence Based Scientific Analysis of Why Masks are Ineffective, Unnecessary, and Harmful, Meehan, 2020	“Decades of the highest-level scientific evidence (including numerous randomized controlled trials) overwhelmingly conclude that masks are ineffective at preventing the transmission of respiratory viruses. . . . Those arguing for masks are relying on low-level evidence (including retrospective trials and mechanistic theories), not the evidence, arguments, and risks of mask mandates.”
93) Open Letter from Medical Doctors and Health Professionals to All Belgian Authorities and All Belgian Media, AIER, 2020	“Oral masks in healthy individuals are ineffective against respiratory infections.”
94) Effectiveness of N95 respirators versus surgical masks against influenza: A systematic review and meta-analysis, Long, 2020	“The use of N95 respirators compared with surgical masks was associated with a lower risk of laboratory-confirmed influenza. It should not be recommended for general public and non-healthcare workers in close contact with influenza patients or suspected cases.”
95) Advice on the use of masks in the context of COVID-19, WHO, 2020	“However, the use of a mask alone is insufficient for personal protection or source control, and other personal and community measures should also be adopted to suppress transmission of the virus.”
96) Farce mask: it's safe for only 20 minutes, The Sydney Morning Herald, 2003	“Health authorities have warned that surgical masks provide only limited protection against the virus.” Those masks are only safe for 20 minutes, said Professor Yvonne Cossart of the Department of Microbiology at the University of Sydney. “As soon as they become saturated with your breath they stop doing their job and pass on the virus to the next person.” They could take as little as 15 or 20 minutes, after which they are no longer safe. But those warnings haven't stopped people from buying them. Retailers reporting they are having trouble keeping them in stock.
97) Study: Wearing A Used Mask Is Potentially Riskier Than No Mask At All, Boyd, 2020	“According to researchers from the University of North Carolina at Baptist University, a three-layer surgical mask is less effective than a new one. The study found that a used mask can become a source of contamination for the next person who wears it. The researchers found that a used mask can become a source of contamination for the next person who wears it. The researchers found that a used mask can become a source of contamination for the next person who wears it.”

Effects of mask-wearing on the inhalability and deposition of airborne SARS-CoV-2 aerosols in human upper airway	particles in the air. That effectiveness, however, is not natural to think that wearing a mask, no matter how well, is more than nothing,” said author Jinxiang Xi. “Our results show that particles larger than 5 micrometers, but not for finer particles, are not filtered,” he continued.”
MASK MANDATES	
1) Mask mandate and use efficacy for COVID-19 containment in US States, Guerra, 2021	“Calculated total COVID-19 case growth and mask use with data from the Centers for Disease Control and Prevention Metrics and Evaluation. We estimated post-mask mandate states using median issuance dates of mask mandates...did not observe association between mask use and COVID-19 spread in US states.”
2) These 12 Graphs Show Mask Mandates Do Nothing To Stop COVID, Weiss, 2020	“Masks can work well when they’re fully sealed, properly worn, and have a filter designed for virus-sized particles. The reality is that masks available on the consumer market, making them a confidence trick rather than a medical solution...Our use of coverings is therefore closer to medieval superstition than to powerful institutions have too much political capital to change this point, so the dogma is perpetuated. The narrative exists because masks succeeded. It says that if cases go down, it’s preventing more cases. The narrative simply assumes that masks work, despite overwhelming scientific evidence to the contrary.”
3) Mask Mandates Seem to Make CCP Virus Infection Rates Climb, Study Says, Vadum, 2020	“Protective-mask mandates aimed at combating the spread of the disease COVID-19 appear to promote the spread of the disease. RationalGround.com, a clearinghouse of COVID-19 data, is a grassroots group of data analysts, computer scientists, and statisticians.”
4) Horowitz: Comprehensive analysis of 50 states shows greater spread with mask mandates, Howorwitz, 2020 Justin Hart	“How long do our politicians get to ignore the results? In states with mandates vs. those without, or periods of mandate vs. without, there is absolutely no evidence that masks slow the spread one iota. In total, in the states that had mandates, there were 9,605,256 confirmed COVID cases over 5,907 total deaths. In states that never had them and the period of time mask mandates were in place) there were 5,781,716 cases over 5,772 total deaths per 100,000 people per day.”
5) The CDC’s Mask Mandate Study: Debunked, Alexander, 2021	“Thus, it is not surprising that the CDC’s own recent study found that of nonpharmaceutical measures such as face masks, the most effective measure was social distancing.”

	that scientific “evidence from 14 randomized controlled trials did not support a substantial effect on transmission. The CDC’s guidance document on nonpharmaceutical public health measures they reported as to face masks that “there is no evidence for reducing transmission...” Similarly, in the fine print of the masking simulation the CDC stated that “The findings on mask usage] should neither be generalized to the real world nor being representative of the effectiveness of these measures in these settings.”
6) Phil Kerpin , tweet, 2021 The Spectator	“The first ecological study of state mask mandates found that “Case growth was independent of mandates at the county level, spread, and mask use did not predict case growth or the timing of waves.”
7) How face masks and lockdowns failed , SPR, 2021	“Infections have been driven primarily by seasonal factors, and mandates and lockdowns have had no discernible effect.”
8) Analysis of the Effects of COVID-19 Mask Mandates on Hospital Resource Consumption and Mortality at the County Level , Schauer, 2021	“There was no reduction in per-population daily ventilator occupancy of COVID-19-positive patients with the implementation of a mask-wearing mandate.”
9) Do we need mask mandates , Harris, 2021	“But masks proved far less useful in the subsequent waves of COVID spread by pathogens smaller than bacteria. California, for instance, reported that the cities of Stockton, which did not, had scarcely different death rates than those with mandates except for a few high-risk professions and settings. Controlled trials (RCTs) on mask use, generally more rigorous than observational studies, though not infallible, typically show that masks offer some protection. A few RCTs suggest that perfect adherence may guard against influenza, but meta-analyses of RCTs suggest masks offer meaningful protection. WHO guidelines recommend masks despite “mechanistic plausibility for the potential benefit.” A recent review showed a benefit too small to be established with confidence. A review by researchers from the University of Hong Kong of the protective effect of surgical masks against influenza, through 2018, was just 22 percent, and it could not be generalized to other settings.”
MASK HARMS	
1) Corona children studies: Co-Ki: First results of a German-wide registry on mouth and nose covering (mask) in children , Schwarz, 2021	“The average wearing time of the mask was 270 minutes. Side effects by wearing the mask were reported by 68% of the children (60%), headache (53%), difficulty concentrating (53%), and difficulty breathing (53%).”

	reluctance to go to school/kindergarten (44%), m and drowsiness or fatigue (37%).”
2) Dangerous pathogens found on children’s face masks, Cabrera, 2021	“Masks were contaminated with bacteria, parasit dangerous pathogenic and pneumonia-causing b
3) Masks, false safety and real dangers, Part 2: Microbial challenges from masks, Borovoy, 2020/2021	“Laboratory testing of used masks from 20 train masks tested contained over 100,000 bacterial co found. Three of the masks contained more than outside surfaces of surgical masks were found to microbes, even in hospitals, more concentrated environment. Staphylococcus species (57%) and predominant among bacteria, and Penicillium sp were the predominant fungi.”
4) Preliminary report on surgical mask induced deoxygenation during major surgery, Beder, 2008	“Considering our findings, pulse rates of the surg after the first hour. This early change in SpO2 ma the operational stress. Since a very small decreas large decrease in PaO2, our findings may have a c and the surgeons.”
5) Mask mandates may affect a child’s emotional, intellectual development, Gillis, 2020	“The thing is we really don’t know for sure what t we do know is that children, especially in early ch of the entire face to get a sense of what’s going o other people in their environment as far as their language development as well... If you think abo them you use part of your mouth. They are intere you think about that part of the face being cover could have an effect. But we don’t know because What we wonder about is if this could play a role affect child development.”
6) Headaches and the N95 face-mask amongst healthcare providers, Lim, 2006	“Healthcare providers may develop headaches fo mask.”
7) Maximizing Fit for Cloth and Medical Procedure Masks to Improve Performance and Reduce SARS-CoV-2 Transmission and Exposure, 2021, Brooks, 2021	“Although use of double masking or knotting and can optimize fit and enhance mask performance protection, double masking might impede breath some wearers, and knotting and tucking can cha no longer covers fully both the nose and the mou
8) Facemasks in the COVID-19 era: A health hypothesis, Vainshelboim, 2021	“Wearing facemasks has been demonstrated to h and psychological effects. These include hypoxia

	increased acidity and toxicity, activation of fear and stress hormones, immunosuppression, fatigue, headache, predisposition for viral and infectious illnesses, and depression.”
9) Wearing a mask can expose children to dangerous levels of carbon dioxide in just THREE MINUTES, study finds, Shaheen/Daily Mail, 2021	“European study found that children wearing masks are exposed to dangerous carbon dioxide levels...Forty-five children were found to have carbon dioxide levels between three to twelve times higher than normal.”
10) How many children must die? Shilhavy, 2020	“How long are parents going to continue masking their children, even to the point of risking their lives? Dr. Shilhavy recorded a video rant that he wants everyone to share. He said his patients almost died from a bacterial lung infection because of mask use.”
11) Medical Doctor Warns that “Bacterial Pneumonias Are on the Rise” from Mask Wearing, Meehan, 2021	“I’m seeing patients that have facial rashes, fungal infections. Reports coming from my colleagues, all over the world, that bacterial pneumonias are on the rise...Why might this be? Members of the public are wearing medical masks in a wrong fashion... They’re becoming contaminated. They take the mask off the rear-view mirror, out of their pocket, from their bag, and reapplying a mask that should be worn fresh and clean.”
12) Open Letter from Medical Doctors and Health Professionals to All Belgian Authorities and All Belgian Media, AIER, 2020	“Wearing a mask is not without side effects. Oxygen deprivation (fatigue, loss of concentration) occurs fairly quickly. Prolonged use can lead to sickness. Every day we now see patients complaining of respiratory problems and hyperventilation due to mask use. Accumulated CO2 leads to a toxic acidification of the blood, which weakens immunity. Some experts even warn of an increase in inappropriate use of the mask.”
13) Face coverings for covid-19: from medical intervention to social practice, Peters, 2020	“At present, there is no direct evidence (from studies in the community) on the effectiveness of universal face mask use in the community to prevent infection with respiratory viruses. Contamination of the upper respiratory tract by viruses and bacteria from medical face masks has been detected in several studies. It has been found that a moist mask is a breeding ground for (antibiotic-resistant) bacteria which can undermine mucosal viral immunity. The recommendation is that medical / surgical masks (instead of homemade cloth masks) should be replaced after a few hours.”
14) Face masks for the public during the covid-19 crisis, Lazzarino, 2020	“The two potential side effects that have already been reported for face mask use may give a false sense of security and lead to a false sense of control.”

	compliance with other infection control measures such as hand washing. (2) Inappropriate use of face masks may increase risk of self-contamination. Face mask users must change their single-use masks frequently or reuse them correctly and adopt other management measures if side effects on others may increase. Other potential side effects include reduced quality and the volume of speech between two people; communication compromised and they may unconsciously come closer together counteract side effect n.1, this side effect may be exacerbated if face mask makes the exhaled air go into the eyes causing irritation feeling and an impulse to touch your eyes. If you are infected while infecting yourself.”
15) Contamination by respiratory viruses on outer surface of medical masks used by hospital healthcare workers, Chughtai, 2019	“Respiratory pathogens on the outer surface of the mask can cause self-contamination. The risk is higher with longer duration and higher rates of clinical contact. Protocols on duration of maximum time of continuous use, and should consider different settings.”
16) Reusability of Facemasks During an Influenza Pandemic, Bailar, 2006	“After considering all the testimony and other information available we concluded that there is currently no simple, reliable way to design devices and enable people to use them safely more than once based on data available about how effective these devices are under real conditions. To the extent they can help at all, they may reduce the respirator or mask will do little to protect a person from influenza research must be done to increase our understanding of better masks and respirators, and to make it easier for people. The use of face coverings is only one of many strategies needed to halt a pandemic, and people should not engage in risky behavior because of risk of exposure to flu just because they have a mask.
17) Exhalation of respiratory viruses by breathing, coughing, and talking, Stelzer-Braid, 2009	“The exhaled aerosols generated by coughing, talking and breathing were collected from 50 subjects using a novel mask, and analyzed using PCR. The exhaled samples from a subset of 10 subjects who had symptoms of upper respiratory tract infections, 2 asymptomatic subjects, 2 PCR, while amongst the 17 asymptomatic subjects none was detected. Overall, rhinovirus was detected in 19 subjects, influenza A virus in 2 subjects, and human metapneumovirus in 1 subject. Of the 25 subjects who had virus-positive nasal mucus, viral particles were detected in 12 breathing samples, 8 talking samples and 5 in a subset of exhaled samples from 10 subjects examined. Rhinovirus was detected in 2.”

18) [Effect of a surgical mask on six minute walking distance], Person, 2018	“Wearing a surgical mask modifies significantly and influences the distance walked.”
19) Protective masks reduce resilience, Science ORF, 2020	“The German researchers used two types of face masks, so-called FFP2 masks, which are mainly used for protection against dust. Measurements were carried out with the help of a cycle ergometer, in this case the test persons exert themselves physically on a so-called ergometer – or a treadmill. The subjects wore either surgical masks or FFP2 masks. The masks were tested for the volume and the highest possible speed of the airflow. The possible force on the ergometer was significantly reduced when wearing FFP2 masks.”
20) Wearing masks even more unhealthy than expected, Corona transition, 2020	“They contain microplastics – and they exacerbate the problem. They are made of polyester and so you have a microplastic problem. Masks would contain polyester with chlorine compounds. If you breathe in front of my face, then of course I breathe in the microplastics. They are much more toxic than if you swallow them, and they enter the digestive system,” Braungart continues.”
21) Masking Children: Tragic, Unscientific, and Damaging, Alexander, 2021	“Children do not readily acquire SARS-CoV-2 (very rarely). Parents, or teachers, or endanger parents or others at home. In rare cases where a child contracts Covid virus it is not fatal. A child can be severely ill or die. Masking can do positive harm to children. But the cost benefit analysis is entirely different for children. For younger children. Whatever arguments there may be, children should not be required to wear masks to prevent the spread of the virus. Zero risk is not attainable – with or without masks. Masking or anything else medicine may develop or government may implement.”
22) The Dangers of Masks, Alexander, 2021	“With that clarion call, we pivot and refer here to the potential danger of the chlorine, polyester, and microplastic face masks (surgical principally but any of the masks) that have become part of our daily lives due to the Covid-19 pandemic. The persuasive power in the government will listen to the public and decisions will be made to reduce the risk to our people.”
23) 13-year-old mask wearer dies for inexplicable reasons, Corona Transition, 2020	“The case is not only causing speculation in Germany but also in the United States. Carbon dioxide. Because the student “was wearing a mask” suddenly collapsed and died a little later in the hospital. Review: The fact that no cause of death was confirmed. The girl’s death is indeed unusual. The carbon dioxide level was about 0.04 percent. From a proportion of four percent. Hypercapnia, i.e. carbon dioxide poisoning, appears.”

	<p>more than 20 percent, there is a risk of deadly ca does not come without alarm signals from the bo netdokter, these include “sweating, accelerated headaches, confusion, loss of consciousness”. Th therefore be an indication of such poisoning.”</p>
<p>24) Student Deaths Lead Chinese Schools to Change Mask Rules, that’s, 2020</p>	<p>“During the month of April, three cases of studen (SCD) while running during gym class have been Hunan provinces. Beijing Evening News noted th masks at the time of their deaths, igniting a critic when students should wear masks.”</p>
<p>25) Blaylock: Face Masks Pose Serious Risks To The Healthy, 2020</p>	<p>“As for the scientific support for the use of face m the literature, in which 17 of the best studies wer the studies established a conclusive relationship protection against influenza infection.”¹ Keep in demonstrate that either a cloth mask or the N95 of the COVID-19 virus. Any recommendations, the influenza virus transmission. And, as you have se their efficiency in controlling flu virus transmissio</p>
<p>26) The mask requirement is responsible for severe psychological damage and the weakening of the immune system, Corona Transition, 2020</p>	<p>“In fact, the mask has the potential to “trigger str via emerging aggression, which correlate signific after-effects”.</p> <p>Prousa is not alone in her opinion. Several psych — and most came to devastating results. Ignoring Prousa.”</p>
<p>27) The physiological impact of wearing an N95 mask during hemodialysis as a precaution against SARS in patients with end-stage renal disease, Kao, 2004</p>	<p>“Wearing an N95 mask for 4 hours during HD sign respiratory adverse effects in ESRD patients.”</p>
<p>28) Is a Mask That Covers the Mouth and Nose Free from Undesirable Side Effects in Everyday Use and Free of Potential Hazards?, Kisielinski, 2021</p>	<p>“We objectified evaluation evidenced changes in wearers with significant correlation of O₂ drop an occurrence of respiratory impairment and O₂ dro N95 mask and O₂ drop (72%), N95 mask and head and temperature rise (88%), but also temperatur masks. Extended mask-wearing by the general p effects and consequences in many medical fields changes and subjective complaints: 1) Increase in breathing resistance 3) Decrease in blood oxygen Decrease in cardiopulmonary capacity 6) Feeling respiratory rate 8) Difficulty breathing and shorttr</p>

	Dizziness 11) Feeling of dampness and heat 12) Dizziness 13) Decrease in empathy perception 14) Dizziness 15) Acne, itching and skin lesions”
29) Is N95 face mask linked to dizziness and headache?, Ipek, 2021	“Respiratory alkalosis and hypocarbia were detected in patients with respiratory alkalosis can cause headache, anxiety, and dizziness. In this study, it was quantitatively shown that the particles in the air cause respiratory alkalosis and hypocarbia.”
30) COVID-19 prompts a team of engineers to rethink the humble face mask, Myers, 2020	“But in filtering those particles, the mask also may have side effects. They are estimated to reduce oxygen intake by anywhere from 1% to 5%, which is significant, even for a healthy person. It can cause dizziness. If you wear a mask long enough, it can damage the lungs. If you experience distress, it can even be life threatening.”
31) 70 doctors in open letter to Ben Weyts: ‘Abolish mandatory mouth mask at school’ – Belgium, World Today News, 2020	“In an open letter to the Flemish Minister of Education, Ben Weyts, 70 doctors ask to abolish the mandatory mouth mask at school for young students. Weyts does not intend to change course. The doctors say Weyts immediately reverses his working method. They say they only protect the risk group and only the advice to wear a mask should consult their doctor.”
32) Face masks pose dangers for babies, toddlers during COVID-19 pandemic, UC Davis Health, 2020	“Masks may present a choking hazard for young children. If the mask is too tight and the fit, the child may have trouble breathing. If the child is unable to take it off,” said UC Davis pediatrician Lena van der Pol. “Children of age will not reliably be able to remove a face mask. Therefore, face masks should not routinely be used for young children. It is more likely they will be to not wear the mask properly. If they touch potentially contaminated masks,” said Dr. Decker. “The risk of infectious diseases at UC Davis Children’s Hospital is low. The developmental level of the individual child. But I think the potential benefit over risk until the teen years.”
33) Covid-19: Important potential side effects of wearing face masks that we should bear in mind, Lazzarino, 2020	“Other potential side effects that we must consider are 1) Decrease in volume of speech between people wearing masks 2) Wearing a mask they may unconsciously come closer 2) Wearing a mask can irritate the eyes. This generates an impulse to touch the eyes. If the eyes are contaminated, you are infecting yourself, 4) Face masks can cause skin irritation. Moreover, a fraction of carbon dioxide previously inhaled is recycled. Those phenomena increase breathing frequency. These worsen the burden of covid-19 if infected people breathe contaminated air. This may also worsen the clinical course. Enhanced breathing pushes the viral load down into the lungs.”

	immunity's efficacy is highly dependent on the vi habitat where SARS-CoV-2 can remain active bec provided by breathing and captured by the mask viral load (by re-inhaling exhaled viruses) and the innate immunity and an increase in infections.”
34) Risks of N95 Face Mask Use in Subjects With COPD, Kyung, 2020	“Of the 97 subjects, 7 with COPD did not wear the mask-failure group showed higher British modifi scale scores and lower FEV ₁ percent of predicted use group. A modified Medical Research Council 167, 95% CI 8.4 to >999.9; P = .008) or a FEV ₁ < 30% to >999.9; P = .001) was associated with a risk of f frequency, blood oxygen saturation, and exhaled significant differences before and after N95 use.”
35) Masks too dangerous for children under 2, medical group warns, The Japan Times, 2020	“Children under the age of 2 shouldn't wear masks difficult and increase the risk of choking, a medic appeal to parents as the nation reopens from the breathing difficult because infants have narrow a burden on their hearts, the association said, add heat stroke for them.”
36) Face masks can be problematic, dangerous to health of some Canadians: advocates, Spenser, 2020	“Face masks are dangerous to the health of some others...Asthma Canada president and CEO Vane could create risk of an asthma attack.”
37) COVID-19 Masks Are a Crime Against Humanity and Child Abuse, Griesz-Brissou, 2020	“The rebreathing of our exhaled air will without a flooding of carbon dioxide. We know that the hur depravation. There are nerve cells for example in longer than 3 minutes without oxygen – they can symptoms are headaches, drowsiness, dizziness, down of the reaction time – reactions of the cogn have chronic oxygen depravation, all of those syn used to it. But your efficiency will remain impaired your brain continues to progress. We know that n to decades to develop. If today you forget your p brain would have already started 20 or 30 years a learn, and the brain needs oxygen to function. W This is simple, indisputable physiology. Consciou deficiency is an absolutely deliberate health haza contraindication.”

38) Study shows how masks are harming children, Mercola, 2021	“Data from the first registry to record children’s e psychological and behavioral issues including ir impaired learning. Since school shutdowns in spr parents are seeking drug treatment for attention for their children. Evidence from the U.K. shows s health officials said they were; measured rates of the community, not higher. A large randomized c does not reduce the spread of SARS-CoV-2.”
39) New Study Finds Masks Hurt Schoolchildren Physically, Psychologically, and Behaviorally, Hall, 2021 https://www.researchsquare.com/article/rs-124394/v2	“A new study , involving over 25,000 school-aged harming schoolchildren physically, psychological distinct health issues associated with wearing ma concerning, the study also found that 29.7% of ch breath, 26.4% experienced dizziness, and hundre accelerated respiration, tightness in chest, weak consciousness.”
40) Protective Face Masks: Effect on the Oxygenation and Heart Rate Status of Oral Surgeons during Surgery, Scarano, 2021	“In all 20 surgeons wearing FFP2 covered by surg O ₂ saturation from around 97.5% before surgery t with increase of heart rates. A shortness of breath were also noted.”
41) Effects of surgical and FFP2/N95 face masks on cardiopulmonary exercise capacity, Fikenzer, 2020	“Ventilation, cardiopulmonary exercise capacity masks and highly impaired by FFP2/N95 face ma are important for recommendations on wearing t exercise.”
42) Headaches Associated With Personal Protective Equipment – A Cross-Sectional Study Among Frontline Healthcare Workers During COVID-19, Ong, 2020	“Most healthcare workers develop de novo PPE-a of their pre-existing headache disorders.”
43) Open letter from medical doctors and health professionals to all Belgian authorities and all Belgian media, The American Institute of Stress, 2020	“Wearing a mask is not without side effects. Oxy fatigue, loss of concentration) occurs fairly quick sickness. Every day we now see patients complain respiratory problems, and hyperventilation due t accumulated CO ₂ leads to a toxic acidification of immunity. Some experts even warn of increased inappropriate use of the mask.”
44) Reusing masks may increase your risk of coronavirus infection, expert says, Laguipo, 2020	“For the public, they should not wear facemasks healthcare worker advised them.” For the averag a street, it is not a good idea,” Dr. Harries said.”W have one mask. They won’t wear it all the time, t

	home, they will put it down on a surface they have added that behavioral issues could adversely put the infection. For instance, people go out and do of the mask or their face, and they get infected.”
45) What’s Going On Under the Masks?, Wright, 2021	“Americans today have pretty good chompers on other people, past and present. Nevertheless, we health as evidenced by the almost complete lack of lockdowns and mandatory masking on our mouths.”
46) Experimental Assessment of Carbon Dioxide Content in Inhaled Air With or Without Face Masks in Healthy Children A Randomized Clinical Trial, Walach, 2021	“A large-scale survey in Germany of adverse effects of 25 930 children has shown that 68% of the participants wearing nose and mouth coverings.”
47) NM Kids forced to wear masks while running in 100-degree heat; Parents are striking back, Smith, 2021	“Nationally, children have a 99.997% survival rate. 0.7% of child COVID-19 cases have resulted in hospitalizations. Kids have an extremely low risk of severe illness or death. School and mask mandates are placing a burden upon kids which is not in their best well-being.”
48) Health Canada issues advisory for disposable masks with graphene, CBC, 2021	“Health Canada is advising Canadians not to use masks with graphene. Health Canada issued the notice on Friday. Graphene, a single layer of carbon atoms. Masks with graphene have been distributed in some health-care facilities.”
49) COVID-19: Performance study of microplastic inhalation risk posed by wearing masks, Li, 2021 Is graphene safe?	“Wearing masks considerably reduces the inhalation risk of microplastics and unknown particles) even when compared with not wearing a mask. Surgical, cotton, fashion, and activated carbon masks reduce microplastic inhalation risk, while all masks generally reduce microplastic inhalation risk under their supposed time (<4 h). N95 poses less risk. Reusing masks after they underwent different disinfection methods can increase the risk of particle (e.g., granular microplastics) inhalation. Ultraviolet disinfection exerts a relatively low risk of microplastic inhalation, and thus, it can be recommended for reusing masks if proven effective from microbiological tests. A single-use mask reduces the inhalation risk of spherical-type microplastics compared with not wearing a mask.”
50) Manufacturers have been using nanotechnology-derived graphene in face masks — now there are safety concerns, Maynard, 2021	“Early concerns around graphene were sparked by the use of carbon — carbon nanotubes. It turns out that some carbon materials can cause serious harm if inhaled. And the natural next-question to ask is whether carbon nanotubes are safe.”

	<p>comes with similar concerns. Because graphene has chemical aspects of carbon nanotubes that make it thin, and hard for the body to get rid of), the individual is safer than its nanotube cousins. But safer doesn't mean that this is not a material that should be used without a good amount of safety testing first... As nanomaterials should not be used in products where they can be inhaled and reach the sensitive lower regions of the respiratory tract.</p>
<p>51) Masking young children in school harms language acquisition, Walsh, 2021</p>	<p>"This is important because children and/or students have a language ability that adults have — they are not censored. The face and especially the mouth is critical to language development. If students are engaged in at all times. Furthermore, language is not only essential to communication but also essential to learning. Studies show that by age four, kids from low-income households have less language than their more affluent counterparts, who get more language from their caretakers." (https://news.stanford.edu/news/2020/09/24/ferald-110514.html)."</p>
<p>52) Dangerous pathogens found on children's face masks, Rational Ground, 2021</p>	<p>"A group of parents in Gainesville, FL, sent 6 face masks to the University of Florida, requesting an analysis of contaminants found on the masks that have been worn. The resulting report found that five masks were contaminated with bacteria, parasites, and fungi, including three with pneumonia-causing bacteria. Although the test is not specific for SARS-CoV-2, only one virus was found on one mask (1)... Half of the masks were contaminated with one or more types of pneumonia-causing bacteria. One-third were contaminated with one or more types of pneumonia-causing bacteria. One-third were contaminated with one or more types of bacterial pathogens. In addition, less dangerous pathogens that can cause fever, ulcers, acne, yeast infections, and other diseases, Rocky Mountain Spotted Fever, and more.</p>
<p>53) Face mask dermatitis" due to compulsory facial masks during the SARS-CoV-2 pandemic: data from 550 health care and non-health care workers in Germany, Niesert, 2021</p>	<p>"The duration of wearing masks showed a significant increase in symptoms ($p < 0.001$). Type IV hypersensitivity was observed in participants with symptoms compared to those without symptoms, whereas no increase in symptoms was observed in participants who used facial skin care products significantly ($p < 0.001$)."</p>
<p>54) Effect of Wearing Face Masks on the Carbon Dioxide Concentration in the Breathing Zone, AAQR/Geiss, 2020</p>	<p>"Detected carbon dioxide concentrations ranged from 100 to 1,000 ppm. The concentrations of carbon dioxide while not wearing a mask were 100 to 900 ppm. Doing office work and standing still on</p>

	<p>dioxide concentrations of around 2200 ppm. A sn walking at a speed of 3 km h⁻¹ (leisurely walking detected range can cause undesirable symptoms of concentration.”</p>
<p>55) Surgical masks as source of bacterial contamination during operative procedures, Zhiqing, 2018</p>	<p>“The source of bacterial contamination in SMs w rather than the OR environment. Moreover, we re change the mask after each operation, especially</p>
<p>56) The Damage of Masking Children Could be Irreparable, Hussey, 2021</p>	<p>“When we surround children with mask-wearers their face barcode recognition during a period of full development of the FFA at risk? Does the dem reducing social interaction, add to the potential c When can we be sure that we won’t interfere with visual neurology so we don’t interfere with brain stimulus interference can we allow without cons currently without answers; we don’t know. Unfor we mess up brain development for faces, we may everything we’ve done.”</p>
<p>57) Masks can be Murder, Grossman, 2021</p>	<p>“Wearing masks can create a sense of anonymity dehumanizing the victim. This prevents empathy murder.” Masking helps remove empathy and co unspeakable acts on the masked person.”</p>
<p>58) London high school teacher calls face masks an ‘egregious and unforgivable form of child abuse, Butler, 2020</p>	<p>“In his email, Farquharson called the campaign t farce, a charade, an act of political theatre” that’ and compliance” than it is about public health. H to “involuntary self-torture,” calling it “an egregi abuse and physical assault.”</p>
<p>59) UK Government Advisor Admits Masks Are Just “Comfort Blankets” That Do Virtually Nothing, ZeroHedge, 2021</p>	<p>“As the UK Government heralds “freedom day” to prominent government scientific advisor has adr protect from coronavirus and are basically just “c noted that “those aerosols escape masks and wil “The public were demanding something must be comfort blanket. But now it is entrenched, and w around the world you can look at mask mandate you cannot see that mask mandates made any et adding that “The best thing you can say about an do have is too small to be measured.”</p>

<p>60) Masks, false safety and real dangers, Part 1: Friable mask particulate and lung vulnerability, Borovoy, 2020</p>	<p>“Surgical personnel are trained to never touch the nose bridge. Otherwise, the mask is considered contaminated. Surgical personnel are strictly trained not to touch the general public. The general public may be seen touching various surfaces. Masks just removed from manufacturer packaging have been found to contain particulate and fiber that would not be expected to elicit a macrophage response and other immune and inflammatory responses. Such inhaled particles specifically from facemasks have been the subject of research. If widespread masking continues, then there will be a large amount of environmental and biological debris continuing to be inhaled by millions of people. This should be alarming for people who are knowledgeable in occupational hazards.”</p>
<p>61) Medical Masks, Desai, 2020</p>	<p>“Face masks should be used only by individuals with respiratory infection such as coughing, sneezing, or, in some cases, by individuals who be worn by health care workers, by individuals who have close contact with people who have respiratory infection, or by a doctor. Face masks should not be worn by health care workers to prevent from acquiring respiratory infection because the masks worn by healthy individuals are effective in preventing the spread of illness.”</p>

Evidence on natural immunity versus COVID-19 vaccine induced immunity:

Study/report title, author, and year published and interactive url link	Predominant finding on natural immunity
1) Necessity of COVID-19 vaccination in previously infected individuals , Shrestha, 2021	“Cumulative incidence of COVID-19 was low in an American healthcare system. The cumulative incidence of infection remained almost zero among previously infected subjects, previously infected subjects who were vaccinated, and uninfected subjects who were vaccinated compared to the cumulative incidence among previously unvaccinated. Not one of the 1359 previously unvaccinated had a SARS-CoV-2 infection in the study. Individuals who have had SARS-CoV-2 infection from COVID-19 vaccination...”
2) SARS-CoV-2-specific T cell immunity in cases of COVID-19 and SARS, and uninfected controls , Le Bert, 2020	“Studied T cell responses against the structural non-structural (NSP7 and NSP13 of ORF1) proteins of SARS-CoV-2 in convalescing from coronavirus disease 2019 (COVID-19) individuals, we found CD4 and CD8 T cells specific to the N protein...showed that patients (n = 17) had long-lasting memory T cells that are reactive 17 years after the outbreak of SARS in 2003. There was cross-reactivity to the N protein of SARS-CoV-2.”
3) Comparing SARS-CoV-2 natural immunity to vaccine-induced immunity: reinfections versus breakthrough infections , Gazit, 2021	“A retrospective observational study comparing (1) naïve individuals who received a two-dose mRNA BNT162b2 vaccine, (2) previously infected and vaccinated, and (3) previously infected and not vaccinated. We found a 13 fold increased risk of breakthrough infection in vaccinated persons, and a 27 fold increased risk of infection in the double vaccinated relative to the single vaccinated persons...the risk of hospitalization was 8 fold higher in vaccinated (para)...this analysis demonstrates longer lasting and stronger protection against reinfection and hospitalization due to the Delta variant compared to BNT162b2 two-dose vaccine-induced immunity.”
4) Highly functional virus-specific cellular immune response in asymptomatic SARS-CoV-2 infection , Le Bert, 2021	“Studied SARS-CoV-2-specific T cells in asymptomatic (n = 75) COVID-19 patients and asymptomatic SARS-CoV-2-infected individuals. They found antiviral immunity; on the contrary, they found a highly functional virus-specific cellular immune response.”

<p>5) Large-scale study of antibody titer decay following BNT162b2 mRNA vaccine or SARS-CoV-2 infection, Israel, 2021</p>	<p>“A total of 2,653 individuals fully vaccinated during the study period and 4,361 convalescent patients were observed. 2 IgG antibody titers were observed in vaccinated individuals (median 355.3 AU/mL IQR [143.8-5644.6]) after the second dose. In convalescents, antibody titers decreased by up to 10-fold. In convalescents they decreased by less than 10-fold. This demonstrates individuals who received the vaccine have different kinetics of antibody levels compared to those infected with the SARS-CoV-2 virus, with the vaccine showing an exponential decrease in the first group”.</p>
<p>6) SARS-CoV-2 re-infection risk in Austria, Pilz, 2021</p>	<p>Researchers recorded “40 tentative re-infections out of the first wave (0.27%) and 253 581 infections in the remaining general population (2.85%) transmission rate (confidence interval) of 0.09 (0.07 to 0.13). This suggests SARS-CoV-2 in Austria. Protection against reinfection is comparable with the highest available estimates for vaccine efficacies.” Additionally, hospitalization in 14,840 people and death in one out of 14,840 (0.006%).</p>
<p>7) mRNA vaccine-induced SARS-CoV-2-specific T cells recognize B.1.1.7 and B.1.351 variants but differ in longevity and homing properties depending on prior infection status, Neidleman, 2021</p>	<p>“Spike-specific T cells from convalescent individuals and those of infection-naïve vaccinees, with previous superior long-term persistence and ability to migrate to including the nasopharynx. These results suggest that elicited T cells respond robustly to the B.1.351 variant that convalescents may not need a second dose.”</p>
<p>8) Good news: Mild COVID-19 induces lasting antibody protection, Bhandari, 2021</p>	<p>“Months after recovering from mild cases of COVID-19, immune cells in their body pumping out antibodies that causes COVID-19, according to a study from Washington University School of Medicine in St. Louis. The study is churning out antibodies all the while. The study, published in the journal Nature, suggest that mild cases of COVID-19 may have lasting antibody protection and that repeat infections are uncommon.”</p>
<p>9) Robust neutralizing antibodies to SARS-CoV-2 infection persist for months, Wajnberg, 2021</p>	<p>“Neutralizing antibody titers against the SARS-CoV-2 virus at least 5 months after infection. Although more studies will be needed to confirm the longevity and efficacy, preliminary results suggest that the chances of reinfection are currently feared.”</p>

<p>10) Evolution of Antibody Immunity to SARS-CoV-2, Gaebler, 2020</p>	<p>“Concurrently, neutralizing activity in plaque type virus assays. In contrast, the number unchanged. Memory B cells display clonal antibodies they express have greater somatopotency and resistance to RBD mutations in the humoral response...we conclude that SARS-CoV-2 evolves between 1.3 and 6.2 months consistent with antigen persistence.”</p>
<p>11) Persistence of neutralizing antibodies a year after SARS-CoV-2 infection in humans, Haveri, 2021</p>	<p>“Assessed the persistence of serum antibody against the WT virus persisted in 89% and 13 months after infection.”</p>
<p>12) Quantifying the risk of SARS-CoV-2 reinfection over time, Murchu, 2021</p>	<p>“Eleven large cohort studies were identified for SARS-CoV-2 reinfection over time, including three and two that enrolled residents and staff. The total number of PCR-positive or antibody was 615,777, and the maximum duration was months in three studies. Reinfection was 0%–1.1%), with no study reporting an increase in time.”</p>
<p>13) Natural immunity to covid is powerful. Policymakers seem afraid to say so, Makary, 2021</p> <p>The Western Journal-Makary</p>	<p>Makary writes “it’s okay to have an incorrect new data proves it wrong, you have to admit leaders and public health officials have held that natural immunity offers unreliable protection contention that is being rapidly debunked have demonstrated the power of immunity virus. A 700,000-person study from Israel had experienced prior infections were 27 symptomatic covid infection than those with June Cleveland Clinic study of health-care workers the virus), in which none who had previously the coronavirus got reinfected. The study who have had SARS-CoV-2 infection are under vaccination.” And in May, a Washington U covid infection resulted in long-lasting immunity “The data on natural immunity are now on Morning Wire. “It turns out the hypothesis that vaccinated immunity is better and stronger</p>

	wrong. They got it backwards. And now w natural immunity is 27 times more effecti
14) <u>SARS-CoV-2 elicits robust adaptive immune responses regardless of disease severity</u> , Nielsen, 2021	“203 recovered SARS-CoV-2 infected patie July 9 th 2020, at least 14 days after COVID- serological profiles within the cohort, det human coronaviruses... the viral surface dominant target for both neutralizing ant Overall, the majority of patients had robu regardless of their disease severity.”
15) <u>Protection of previous SARS-CoV-2 infection is similar to that of BNT162b2 vaccine protection: A three-month nationwide experience from Israel</u> , Goldberg, 2021	“Analyze an updated individual-level data to assess the protection efficacy of both p preventing subsequent SARS-CoV-2 infect severe disease, and death due to COVID-1 with overall estimated efficacy for docum 93·0]); hospitalization 94·2% (CI:[93·6, 94· 95·0]); and death 93·7% (CI:[92·5, 94·7]). S protection from prior SARS-CoV-2 infectio (CI: [94·4, 95·1]); hospitalization 94·1% (CI (CI: [92·5, 98·3])...results question the nee individuals.”
16) <u>Incidence of Severe Acute Respiratory Syndrome Coronavirus-2 infection among previously infected or vaccinated employees</u> , Kojima, 2021	“Employees were divided into three group unvaccinated, (2) previous SARS-CoV-2 in days were measured from the date of the the end of the observation period. SARS-C positive SARS-CoV-2 PCR tests in a 30-day records for groups 1, 2, and 3...previous S for SARS-CoV-2 were associated with decre with SARS-CoV-2 in a routinely screened v the infection incidence between vaccinat previous infection.”
17) <u>Having SARS-CoV-2 once confers much greater immunity than a vaccine—but vaccination remains vital</u> , Wadman, 2021	“Israelis who had an infection were more coronavirus variant than those who had a vaccine...the newly released data show p infection were much less likely than neve Delta, develop symptoms from it, or beco 19.”
18) <u>One-year sustained cellular and humoral immunities of COVID-19 convalescents</u> , Zhang, 2021	“A systematic antigen-specific immune ev convalescents; SARS-CoV-2-specific IgG a

	<p>among over 95% COVID-19 convalescents disease onset. At least 19/71 (26%) of COVID-19 convalescents (19/71) had detectable circulating SARS-CoV-2 at 12m post-disease onset. Notably, the positive SARS-CoV-2-specific T-cell responses (antigen S1, S2, M and N protein) were 71/12m, respectively.”</p>
<p>19) Functional SARS-CoV-2-Specific Immune Memory Persists after Mild COVID-19, Rodda, 2021</p>	<p>“Recovered individuals developed SARS-CoV-2 antibodies, neutralizing plasma, and memory lymphocytes persisted for at least 3 months. Our data found that IgG memory B cells increased over time. Antigen-specific memory lymphocytes exhibited characteristic function: memory T cells secreted cytokines upon encounter, whereas memory B cells expressed neutralizing virus when expressed as monoclonal antibodies. COVID-19 elicits memory lymphocytes that exhibit hallmarks of antiviral immunity.”</p>
<p>20) Discrete Immune Response Signature to SARS-CoV-2 mRNA Vaccination Versus Infection, Ivanova, 2021</p>	<p>“Performed multimodal single-cell sequencing of immune cells with acute COVID-19 and healthy volunteers. We compared SARS-CoV-2 BNT162b2 mRNA vaccine to COVID-19 infection elicited by the virus and by this vaccine. ... COVID-19 induced robust innate and adaptive immune responses with significant qualitative differences between infection and vaccine challenges. In COVID-19 patients, immune cells showed a highly augmented interferon response which was absent in vaccine recipients. Increased interferon signaling led to a dramatic upregulation of cytotoxic genes in immune cells like lymphocytes in patients but not in immunized individuals. Cell receptor repertoires revealed that while TCRs in COVID-19 patients were effector cells, in vaccine recipients expanded cells were primarily circulating memory cells. The presence of cytotoxic CD4 T cells in COVID-19 patients and in healthy volunteers following immunization suggests that inflammatory responses and cytotoxic cell-mediated immunopathology in severe illness, in mild illness, and in vaccine features are indicative of protective immunity against infection.”</p>
<p>21) SARS-CoV-2 infection induces long-lived bone marrow plasma cells in humans, Turner, 2021</p>	<p>“Bone marrow plasma cells (BMPCs) are a key component of protective antibodies... durable serum antibody responses are maintained by BMPCs.”</p>

	<p>in convalescent individuals with asymptomatic infection. This was associated with an induced expansion of larger CD8 T cell clones due to the recognition of a broader set of epitopes not seen in the mRNA vaccine.”</p>
<p>27) SARS-CoV-2 antibody-positivity protects against reinfection for at least seven months with 95% efficacy, Abu-Raddad, 2021</p>	<p>“SARS-CoV-2 antibody-positive persons from the community with a PCR-positive swab ≥ 14 days after their last PCR test were investigated for evidence of reinfection, 400 persons were followed for a median of 16.3 weeks in the international population of Qatar. Natural immunity provided protection against reinfection with an efficacy of 95%.”</p>
<p>28) Orthogonal SARS-CoV-2 Serological Assays Enable Surveillance of Low-Prevalence Communities and Reveal Durable Humoral Immunity, Ripperger, 2020</p>	<p>“Conducted a serological study to define the immune response to SARS-CoV-2. Compared to those with mild coronavirus disease cases, individuals with severe disease exhibited higher titers and antibodies against the nucleocapsid protein and the receptor-binding domain (RBD) of the spike protein...neutralizing antibody production persists for at least 5–7 months after infection. However, it frequently becomes undetectable by 5–7 months.”</p>
<p>29) Anti-spike antibody response to natural SARS-CoV-2 infection in the general population, Wei, 2021</p>	<p>“In the general population using representative samples from the United Kingdom COVID-19 infection survey participants, the level of anti-spike antibody response to SARS-CoV-2 PCR tests from 26-April-2020 to 14-May-2021 was significantly higher than levels associated with protection against reinfection. On average, with levels associated with protection against reinfection for several years. These estimates could inform the timing of booster strategies.”</p>
<p>30) Researchers find long-lived immunity to 1918 pandemic virus, CIDRAP, 2008</p> <p>and the actual 2008 NATURE journal publication by Yu</p>	<p>“A study of the blood of older people who survived the 1918 pandemic reveals that antibodies to the virus may perhaps be engineered to protect future generations from the virus strains...the group collected blood samples from 91 to 101-year-olds. The people recruited for the study had many recalled sick family members in the past. When they were directly exposed to the virus, the antibodies were present in 100% of the subjects had serum-neutralizing activity. 94% showed serologic reactivity to the 1918 virus. The generated B lymphoblastic cell lines from the subjects. Cells of eight subjects. Transformed cells were screened and yielded secreting antibodies that bound to the virus. This shows that of the 32 individuals tested that the antibodies showed sero-reactivity with the 1918 virus.”</p>

	Seven of the eight donor samples tested for antibodies that bound the 1918 HA. We is generated five monoclonal antibodies that against 1918 virus from three separate donors reacted with the genetically similar HA of
31) Live virus neutralisation testing in convalescent patients and subjects vaccinated against 19A, 20B, 20I/501Y.V1 and 20H/501Y.V2 isolates of SARS-CoV-2 , Gonzalez, 2021	“No significant difference was observed between HCWs with mild COVID-19 and critical patients in neutralisation ability was found for 20I/501Y.V1 isolate for critical patients and HCWs 6-month 20H/501Y.V2, all populations had a significant antibody titres in comparison with the 19A. No difference in neutralisation capacity was observed between the two variants whereas it was significant in groups...the reduced neutralising response in comparison with the 19A and 20I/501Y.V1. In subjects with the BNT162b2 vaccine is a significant
32) Differential effects of the second SARS-CoV-2 mRNA vaccine dose on T cell immunity in naïve and COVID-19 recovered individuals , Camara, 2021	“Characterized SARS-CoV-2 spike-specific T cell immunity in naïve and previously infected individuals after vaccination...results demonstrate that the humoral and cellular immunity in naïve individuals after second BNT162b2 vaccine dose results in similar COVID-19 recovered individuals.”
33) Op-Ed: Quit Ignoring Natural COVID Immunity , Klausner, 2021	“Epidemiologists estimate over 160 million people have recovered from COVID-19. Those who have recovered are at risk of repeat infection, disease, or death.”
34) Association of SARS-CoV-2 Seropositive Antibody Test With Risk of Future Infection , Harvey, 2021	“To evaluate evidence of SARS-CoV-2 infection among patients with a positive NAAT (NAAT) among patients with a positive NAAT for antibodies in an observational descriptive study and linked claims data...the cohort included patients with a positive index antibody test...patients with positive NAAT results were more likely to have positive NAAT results, but became markedly less likely over time, suggesting that seropositivity is associated with infection.”
35) SARS-CoV-2 seropositivity and subsequent infection risk in healthy young adults: a prospective cohort study , Letizia, 2021	“Investigated the risk of subsequent SARS-CoV-2 infection (CHARM marine study) seropositive for a previous infection among participants, of whom 3168 (98%) continued to be seropositive. 3076 (95%) participants...Among 189 seropositive participants, 189 seropositive participants

	<p>least one positive PCR test for SARS-CoV-2 cases per person-year). In contrast, 1079 participants tested positive (6.2 cases per person-year) (95% CI 4.8-7.6; $p<0.001$)...infectious viral loads that were about 10-times lower than those of the non-infected participants (ORF1ab gene cycle threshold $p=0.004$).”</p>
<p>36) Associations of Vaccination and of Prior Infection With Positive PCR Test Results for SARS-CoV-2 in Airline Passengers Arriving in Qatar, Bertollini, 2021</p>	<p>“Of 9,180 individuals with no record of vaccination or prior infection at least 90 days before the PCR test, 1079 tested positive to individuals with no record of vaccination or prior infection, among whom PCR positivity was 1.01% (95% CI, 0.63%-1.39%), respectively. The relative risk was 0.17-0.28) for vaccinated individuals and 0.17-0.28) for vaccinated individuals and 0.17-0.28) for vaccinated individuals with prior infection compared with no record of infection.”</p>
<p>37) Natural immunity against COVID-19 significantly reduces the risk of reinfection: findings from a cohort of sero-survey participants, Mishra, 2021</p>	<p>“Followed up with a subsample of our previous study to assess whether natural immunity against COVID-19 reduced risk of re-infection (India)... out of 1068 sero-positive and 1068 were sero-negative. The survey found that only 3 individuals in the sero-negative group reported COVID-19 whereas 127 individuals reported COVID-19 in the sero-positive group...from the 3 sero-positive individuals, 2 required hospitalization, but did not require oxygen therapy or intensive care...development of antibody following infection...development of antibody following infection against re-infection by the virus to a greater extent...progression to severe COVID-19 disease.”</p>
<p>38) Lasting immunity found after recovery from COVID-19, NIH, 2021</p>	<p>“The researchers found durable immune responses to the virus studied. Antibodies against the spike protein, which the virus uses to get inside cells, were found in 98% of participants at 6 months after symptom onset. As seen in previous studies, antibody levels varied widely between individuals. But, promisingly, antibody levels over time, declining only modestly at 6 to 12 months. Meanwhile, specific B cells increased over time. People had more B cells 6 months after symptom onset than at one month. And for the virus also remained high after infection. At 6 months after onset, 92% of participants had CD4+ T cells. And 92% of the people had at least 3 out of 5 immune responses that recognize SARS-CoV-2 up to 8 months after infection.”</p>

<p>39) <u>SARS-CoV-2 Natural Antibody Response Persists for at Least 12 Months in a Nationwide Study From the Faroe Islands</u>, Petersen, 2021</p>	<p>“The seropositive rate in the convalescent sampling time points for both assays and almost all convalescent individuals developed SARS-CoV-2 antibodies persisted at least maybe even longer, indicating that COVID protected from reinfection.”</p>
<p>40) <u>SARS-CoV-2-specific T cell memory is sustained in COVID-19 convalescent patients for 10 months with successful development of stem cell-like memory T cells</u>, Jung, 2021</p>	<p>“ex vivo assays to evaluate SARS-CoV-2-specific in COVID-19 convalescent patients up to 3 and find that memory T cell responses are regardless of the severity of COVID-19. In polyfunctionality and proliferation capacity. Among SARS-CoV-2-specific CD4⁺ and CD8⁺ induced markers, the proportion of stem increased, peaking at approximately 120</p>
<p>41) <u>Immune Memory in Mild COVID-19 Patients and Unexposed Donors Reveals Persistent T Cell Responses After SARS-CoV-2 Infection</u>, Ansari, 2021</p>	<p>“Analyzed 42 unexposed healthy donors a months from the recovery for SARS-CoV-2. Using HLA class II predicted peptide meg cross-reactive CD4⁺ T cells in around 66%. Moreover, we found detectable immune r several months after recovery in the cruci immunity; CD4⁺ T cells and B cells, with a cells. Interestingly, the persistent immune predominantly targeted towards the Spik. This study provides the evidence of both persistent immune memory in Indian pop</p>
<p>42) <u>COVID-19 natural immunity</u>, WHO, 2021</p>	<p>“Current evidence points to most individu immune responses following natural infe following infection, 90-99% of individuals develop detectable neutralizing antibodies immune responses to SARS-CoV-2 are not available data suggests that it varies by a Available scientific data suggests that in r remain robust and protective against rein infection (the longest follow up with stron approximately 8 months).”</p>
<p>43) <u>Antibody Evolution after SARS-CoV-2 mRNA Vaccination</u>, Cho, 2021</p>	<p>“We conclude that memory antibodies se have greater potency and breadth than a vaccination...boosting vaccinated individ</p>

	vaccines would produce a quantitative increase in antibody levels but not the qualitative advantage against reinfection in convalescent individuals.”
44) Humoral Immune Response to SARS-CoV-2 in Iceland , Gudbjartsson, 2020	“Measured antibodies in serum samples from 1797 persons who had recovered from SARS-CoV-2 infection. 1793 who were tested (99.3%) were seropositive for SARS-CoV-2. Infection was 0.3% and that antiviral antibody levels declined within 4 months after diagnosis (p=0.0001).”
45) Immunological memory to SARS-CoV-2 assessed for up to 8 months after infection , Dan, 2021	“Analyzed multiple compartments of circulating antibodies to SARS-CoV-2 in 254 samples from 188 COVID-19 cases. IgG to the Spike protein was the most abundant antibody. Spike-specific memory B cells were more abundant 1 month post symptom onset.”
46) The prevalence of adaptive immunity to COVID-19 and reinfection after recovery – a comprehensive systematic review and meta-analysis of 12 011 447 individuals , Chivase, 2021	“Fifty-four studies, from 18 countries, with 12 011 447 individuals followed up to 8 months after recovery, were included. After recovery, the prevalence of detectable SARS-CoV-2-specific memory remained high; IgG – 90.4%... post-infection 0.2% (95%CI 0.0 – 0.7, I ² = 98.8, 9 studies). SARS-CoV-2-specific memory B cells were more abundant 1 month post symptom onset. COVID-19 had an 81% reduction in odds of reinfection (95%CI 0.3, I ² = 90.5%, 5 studies).”
47) Reinfection Rates among Patients who Previously Tested Positive for COVID-19: a Retrospective Cohort Study , Sheehan, 2021	“Retrospective cohort study of one multi-center hospital. 150,325 patients tested for COVID-19 infection. 150,325 patients tested for COVID-19 infection. COVID-19 was highly protective against reinfection. This protection increased over time, suggesting that the immune response may persist beyond 90 days post-infection.”
48) Assessment of SARS-CoV-2 Reinfection 1 Year After Primary Infection in a Population in Lombardy, Italy , Vitale, 2020	“The study results suggest that reinfection after recovery from COVID-19 have a low risk. Immunity to SARS-CoV-2 appears to confer protection against reinfection which is similar to the protection reported for other viral infections.”
49) Prior SARS-CoV-2 infection is associated with protection against symptomatic reinfection , Hanrath, 2021	“We observed no symptomatic reinfection among health care workers...this apparent immunity to reinfection persisted for 12 months...test positivity rates were 0% (0/100) among health care workers with previous infection compared to 13.7% (29/211) among health care workers without (P<0.0001 χ^2 test).”

<p>50) Targets of T Cell Responses to SARS-CoV-2 Coronavirus in Humans with COVID-19 Disease and Unexposed Individuals, Grifoni, 2020</p>	<p>“Using HLA class I and II predicted peptide libraries, SARS-CoV-2-specific CD8⁺ and CD4⁺ T cells were identified in convalescent patients, respectively. CD4⁺ T cells were the target of most vaccine efforts, were robustly detected by the anti-SARS-CoV-2 IgG and IgA titers. CD4⁺ T cells accounted for 11%–27% of the total CD4⁺ T cells, commonly targeting nsp3, nsp4, ORF3a, and ORF8. CD8⁺ T cells, spike and M were recognized and targeted.”</p>
<p>51) NIH Director’s Blog: Immune T Cells May Offer Lasting Protection Against COVID-19, Collins, 2021</p>	<p>“Much of the study on the immune response to the coronavirus that causes COVID-19, has focused on antibodies. But, in fact, immune cells known as memory T cells play a role in the ability of our immune systems to protect against future infections including—it now appears—COVID-19. A study of memory T cells suggests they might protect some people from COVID-19 by remembering past encounters with the virus. This might potentially explain why some people appear to be less susceptible to becoming severely ill.”</p>
<p>52) Ultrapotent antibodies against diverse and highly transmissible SARS-CoV-2 variants, Wang, 2021</p>	<p>“Our study demonstrates that convalescent plasma containing ancestral variant SARS-CoV-2 produce an antibody response to emerging VOCs with high potency...potentially neutralizing variants of concern.”</p>
<p>53) Why COVID-19 Vaccines Should Not Be Required for All Americans, Makary, 2021</p>	<p>“Requiring the vaccine in people who are already immune has no scientific support. While it might be beneficial – and it’s a reasonable hypothesis – to argue dogma about the longevity of their immunity – to argue dogma that the vaccinated has zero clinical outcome data is not supported. We have data to the contrary: A Cleveland Clinic study of 100 people with natural immunity did not adduce any evidence that immunity was waning.”</p>
<p>54) Protracted yet coordinated differentiation of long-lived SARS-CoV-2-specific CD8⁺ T cells during COVID-19 convalescence, Ma, 2021</p>	<p>“Screened 21 well-characterized, longitudinal cohorts of individuals that recovered from mild COVID-19...found that SARS-CoV-2-specific CD8⁺ T cells not only persisted but differentiated in a coordinated fashion well into convalescence, forming long-lived, self-renewing memory.”</p>
<p>55) Decrease in Measles Virus-Specific CD4 T Cell Memory in Vaccinated Subjects, Naniche, 2004</p>	<p>“Characterized the profiles of measles virus-specific T cells over time since vaccination. In a cohort of subjects with a history of MV vaccination, measles virus-specific CD8 T cells could be detected up to 34 years after vaccination.”</p>

	specific CD8 T cells and MV-specific IgG re MV-specific CD4 T cells decreased signific vaccinated >21 years earlier.”
56) Remembrance of Things Past: Long-Term B Cell Memory After Infection and Vaccination , Palm, 2019	“The success of vaccines is dependent on immunological memory. The immune sys encountered pathogens, and memory B a responses to infection. Studies in mice ha different memory B cell populations are g and how affinity for the antigen is determ exposure to an antigen the memory recal more specific than a naïve response. Prot circulating antibodies secreted by LLPCs. immediate pathogen neutralization and e recalled.”
57) SARS-CoV-2 specific memory B-cells from individuals with diverse disease severities recognize SARS-CoV-2 variants of concern , Lyski, 2021	“Examined the magnitude, breadth, and c antibodies in two distinct B-cell compart antibodies in the plasma, and peripheral associated antibody profiles elicited after magnitude varied amongst individuals, b subjects. Variants of concern (VoC) -RBD- plasma of 72% of samples in this investig B-cells were found in all but 1 subject at a VoC-RBD-reactive MBCs are present in the including those that experienced asymp reason for optimism regarding the capaci and/or both, to limit disease severity and they continue to arise and circulate.”
58) Exposure to SARS-CoV-2 generates T-cell memory in the absence of a detectable viral infection , Wang, 2021	“T-cell immunity is important for recovery heightened immunity for re-infection. Ho CoV-2-specific T-cell immunity in virus-ex specific CD4 ⁺ and CD8 ⁺ T-cell memory in re contacts...close contacts are able to gain despite lacking a detectable infection.”
59) CD8+ T-Cell Responses in COVID-19 Convalescent Individuals Target Conserved Epitopes From Multiple Prominent SARS-CoV-2 Circulating Variants , Redd, 2021and Lee , 2021	“The CD4 and CD8 responses generated a robust, showing activity against multiple spike protein of the virus. For instance, CD CD4 cells respond to 57 epitopes across th mutations in the variants cannot knock o

	response...only 1 mutation found in Beta previously identified epitope (1/52), suggest 2 CD8+ T-cell responses should recognize
60) Exposure to common cold coronaviruses can teach the immune system to recognize SARS-CoV-2 , La Jolla, Crotty and Sette, 2020	“Exposure to common cold coronaviruses recognize SARS-CoV-2”
61) Selective and cross-reactive SARS-CoV-2 T cell epitopes in unexposed humans , Mateus, 2020	“Found that the pre-existing reactivity against T cells and that cross-reactive T cells can recognize epitope as well as the homologous epitope. These findings underline the importance of existing immune memory in COVID-19 disease”
62) Longitudinal observation of antibody responses for 14 months after SARS-CoV-2 infection , Dehgani-Mobaraki, 2021	“Better understanding of antibody responses after infection might provide valuable insights into the development of vaccination policies . Longitudinal analysis carried out in 32 recovered COVID-19 patients based on 14 months after Mild and Moderately-Severe infection was consistent with recent studies reporting a durable induced SARS-CoV-2 immunity through natural infection, efficacious against re-infection (>90%) and sustained for months. Our study followed up patients up to 14 months. The presence of anti-S-RBD IgG in 96.8% of recovered patients”
63) Humoral and circulating follicular helper T cell responses in recovered patients with COVID-19 , Juno, 2020	“Characterized humoral and circulating follicular helper T cell responses against spike in recovered patients with COVID-19. We found that S-specific antibodies, memory B cells, and T cells elicited after SARS-CoV-2 infection, demonstrated a positive association with plasma neutralization”
64) Convergent antibody responses to SARS-CoV-2 in convalescent individuals , Robbiani, 2020	“149 COVID-19-convalescent individuals. The study showed the expansion of clones of RBD-specific memory B cells and related antibodies in different individuals. The results pointed to three distinct epitopes on the RBD neutralizing and inhibitory concentrations (IC ₅₀ values) as likely targets for vaccine development”
65) Rapid generation of durable B cell memory to SARS-CoV-2 spike and nucleocapsid proteins in COVID-19 and convalescence , Hartley, 2020	“COVID-19 patients rapidly generate B cell memory to spike and nucleocapsid antigens following SARS-CoV-2 infection. IgG and Bmem cells were detected in all 20 patients”

66) Had COVID? You'll probably make antibodies for a lifetime , Callaway, 2021	"People who recover from mild COVID-19 churn out antibodies for decades...the st triggered by SARS-CoV-2 infection will be
67) A majority of uninfected adults show preexisting antibody reactivity against SARS-CoV-2 , Majdoubi, 2021	In greater Vancouver Canada, "using a high positive/negative thresholds established antibodies have waned, we determined th adults showed antibody reactivity against domain (RBD), N-terminal domain (NTD), SARS-CoV-2."
68) SARS-CoV-2-reactive T cells in healthy donors and patients with COVID-19 , Braun, 2020 Presence of SARS-CoV-2-reactive T cells in COVID-19 patients and healthy donors , Braun, 2020	"The results indicate that spike-protein cr were probably generated during previous coronaviruses." "The presence of pre-existing SARS-CoV-2 CoV-2 naïve HD is of high interest."
69) Naturally enhanced neutralizing breadth against SARS-CoV-2 one year after infection , Wang, 2021	"A cohort of 63 individuals who have reco 6.2 and 12 months after SARS-CoV-2 infec in convalescent individuals will be very lo
70) One Year after Mild COVID-19: The Majority of Patients Maintain Specific Immunity, But One in Four Still Suffer from Long-Term Symptoms , Rank, 2021	"Long-lasting immunological memory ag 19... activation-induced marker assays id central memory T-cells in 80% of particip
71) IDSA , 2021	"Immune responses to SARS-CoV-2 follow least 11 months... natural infection (as de or PCR-test result) can confer protection a
72) Assessment of protection against reinfection with SARS-CoV-2 among 4 million PCR-tested individuals in Denmark in 2020: a population-level observational study , Holm Hansen, 2021	Denmark, "during the first surge (ie, before tested, of whom 11 727 (2·20%) were PCR follow-up in the second surge, of whom 1 during the first surge. Among eligible PCR surge of the epidemic, 72 (0·65% [95% CI during the second surge compared with 1 who tested negative during the first surge 0·246])."
73) Antigen-Specific Adaptive Immunity to SARS-CoV-2 in Acute COVID-19 and Associations with Age and Disease Severity , Moderbacher, 2020	"Adaptive immune responses limit COVID coordinated arms of adaptive immunity c responses...completed a combined exam adaptive immunity at the level of SARS-Co

	<p>neutralizing antibody responses in acute</p> <p>2-specific CD4⁺ and CD8⁺ T cells were each</p> <p>Coordinated SARS-CoV-2-specific adaptiv</p> <p>with milder disease, suggesting roles for h</p> <p>protective immunity in COVID-19.”</p>
<p>74) Detection of SARS-CoV-2-Specific Humoral and Cellular Immunity in COVID-19 Convalescent Individuals, Ni, 2020</p>	<p>“Collected blood from COVID-19 patients and therefore were discharged, and detected cellular immunity in eight newly discharged another cohort of six patients 2 weeks post of immunoglobulin G (IgG) antibodies. In serum-neutralizing activities in a pseudot strong correlation between neutralization virus-specific T cells.”</p>
<p>75) Robust SARS-CoV-2-specific T-cell immunity is maintained at 6 months following primary infection, Zuo, 2020</p>	<p>“Analysed the magnitude and phenotype response in 100 donors at six months following this to the profile of antibody level against the previous six months. T-cell immune response by ELISPOT and/or ICS analysis in all donors predominant CD4⁺ T cell responses with functional SARS-CoV-2-specific T-cell response following infection.”</p>
<p>76) Negligible impact of SARS-CoV-2 variants on CD4⁺ and CD8⁺ T cell reactivity in COVID-19 exposed donors and vaccinees, Tarke, 2021</p>	<p>“Performed a comprehensive analysis of T cell responses from COVID-19 convalescent strain, compared to variant lineages B.1.1 as recipients of the Moderna (mRNA-1273) COVID-19 vaccines... the sequences of the epitopes are not affected by the mutations. Overall, the results demonstrate that CD4⁺ convalescent COVID-19 subjects or COVID substantially affected by mutations.”</p>
<p>77) A 1 to 1000 SARS-CoV-2 reinfection proportion in members of a large healthcare provider in Israel: a preliminary report, Perez, 2021</p>	<p>Israel, “out of 149,735 individuals with a COVID between March 2020 and January 2021, 1, 100 days apart, reflecting a reinfection pr</p>
<p>78) Persistence and decay of human antibody responses to the receptor binding domain of SARS-CoV-2 spike protein in COVID-19 patients, Iyer, 2020</p>	<p>“Measured plasma and/or serum antibody domain (RBD) of the spike (S) protein of SARS patients infected with SARS-CoV-2 (of whom to 122 days after symptom onset and compared individuals whose blood samples were ob</p>

	<p>antibodies persisted at detectable levels symptom onset, and seroreversion was observed in individuals. The concentration of these antibodies correlated with pseudovirus NAb titers, with a slow decay. The observation that IgG and neutralizing antibodies were encouraging, and suggests the development of memory in individuals with severe infections.</p>
<p>79) A population-based analysis of the longevity of SARS-CoV-2 antibody seropositivity in the United States, Alfego, 2021</p>	<p>“To track population-based SARS-CoV-2 antibody seropositivity across the United States using observational data from a national laboratory registry of patients tested by neutralizing antibody serologic assays... specimens from 39,080 patients with COVID-19...both S and N SARS-CoV-2 antibody seropositivity over a 10-month view of how long humans may have protective immunity with curve smoothing showing population-level seropositivity for three weeks, regardless of whether the asymptomatic or symptomatic. Importantly, this level of seropositivity was maintained for ten months after initial positive PCR.”</p>
<p>80) What are the roles of antibodies versus a durable, high-quality T-cell response in protective immunity against SARS-CoV-2? Hellerstein, 2020</p>	<p>“Progress in laboratory markers for SARS-CoV-2 infection: identification of epitopes on CD4 and CD8 T cells. T cell responses are much less dominated by spike protein than in other viral infections. Although most vaccine candidates are based on the spike antigen, natural infection by SARS-CoV-2 induces a cross-reactive with other betacoronaviruses.</p>
<p>81) Broad and strong memory CD4⁺ and CD8⁺ T cells induced by SARS-CoV-2 in UK convalescent COVID-19 patients, Peng, 2020</p>	<p>“Study of 42 patients following recovery from COVID-19 and 14 severe cases, comparing their T cell responses to healthy donors...found the breadth, magnitude and duration of T cell responses from COVID-19 were significantly higher than in healthy COVID-19 cases, and this effect was most pronounced for CD8⁺ T cells. CD4⁺ T cells were also elevated, and correlated with the anti-Spike, anti-Receptor Binding Domain (RBD), anti-Nucleoprotein (NP) endpoint antibody titers. The ratio of SARS-CoV-2-specific CD8⁺ to CD4⁺ T cells was correlated with the number of epitope clusters and peptides containing the epitopes. These findings will provide critical tools to study the role of T cells in the resolution of SARS-CoV-2 infections.”</p>
<p>82) Robust T Cell Immunity in Convalescent Individuals with Asymptomatic or Mild COVID-19, Sekine, 2020</p>	<p>“SARS-CoV-2-specific memory T cells will be critical for immune protection against COVID-19...mapping the landscape of SARS-CoV-2-specific T cell responses.</p>

	<p>exposed family members, and individuals</p> <p>19...collective dataset shows that SARS-CoV-2 infection elicits a functionally replete memory T cell response, and that prior infection may prevent recurrent episodes</p>
<p>83) Potent SARS-CoV-2-Specific T Cell Immunity and Low Anaphylatoxin Levels Correlate With Mild Disease Progression in COVID-19 Patients, Lafron, 2021</p>	<p>“Provide a full picture of cellular and humoral immune responses in COVID-19 patients and prove that robust polyfunctional T cell responses are concomitant with low anaphylatoxin levels</p>
<p>84) SARS-CoV-2 T-cell epitopes define heterologous and COVID-19 induced T-cell recognition, Nelde, 2020</p>	<p>“The first work identifying and characterizing SARS-CoV-2 reactive HLA class I and HLA-DR T-cell epitopes in COVID-19 patients (n = 180) as well as unexposed individuals (n = 180) for immunity and COVID-19 disease course. The study revealed pre-existing T-cell responses in unexposed individuals, and validation of similarity to SARS-CoV-2 epitopes provided a functional basis for postulated cross-reactivity to SARS-CoV-2 infection...intensity of T-cell responses was significantly higher in the convalescent phase compared to unexposed individuals, suggesting that natural immunity to SARS-CoV-2 spread of SARS-CoV-2 T-cell responses occurs</p>
<p>85) Karl Friston: up to 80% not even susceptible to Covid-19, Sayers, 2020</p>	<p>“Results have just been published of a study showing that up to 80% of people who have not been exposed to COVID-19 have a similar level from other similar coronaviruses like SARS-CoV-2. This is of people who are not even susceptible to COVID-19</p>
<p>86) CD8+ T cells specific for an immunodominant SARS-CoV-2 nucleocapsid epitope cross-react with selective seasonal coronaviruses, Lineburg, 2021</p>	<p>“Screening of SARS-CoV-2 peptide pools revealed a strong T cell response in individuals that was also detectable in unexposed individuals. Selective T cell cross-reactivity for an immunodominant SARS-CoV-2 epitope and its homologs from seasonal coronaviruses suggests protective immunity.”</p>
<p>87) SARS-CoV-2 genome-wide mapping of CD8 T cell recognition reveals strong immunodominance and substantial CD8 T cell activation in COVID-19 patients, Saini, 2020</p>	<p>“COVID-19 patients showed strong T cell activation. CD8+ lymphocytes specific to SARS-CoV-2 epitopes derived from ORF1 (open reading frame 1) were highly activated. A strong signature of T cell activation was observed in COVID-19 patients, while no T cell activation was seen in the ‘non-exposed’ healthy donors.”</p>
<p>88) Equivalency of Protection from Natural Immunity in COVID-19 Recovered Versus Fully Vaccinated Persons: A Systematic Review and Pooled Analysis, Shenai, 2021</p>	<p>“Systematic review and pooled analysis of COVID-19 patients specifically compare the protection of natural immunity in recovered versus the efficacy of full vaccination</p>

	added benefit of vaccination in the COVID subsequent SARS-CoV-2 infection...review in COVID-recovered individuals is, at least afforded by full vaccination of COVID-naïve incremental relative benefit to vaccination however, the net benefit is marginal on an
89) ChAdOx1nCoV-19 effectiveness during an unprecedented surge in SARS CoV-2 infections , Satwik, 2021	“The third key finding is that previous infection significantly protective against all studied 93% (87 to 96%) seen against symptomatic moderate to severe disease and 85% (-9 to 100%) therapy. All deaths occurred in previously healthy higher protection than that offered by sin
90) SARS-CoV-2 specific T cells and antibodies in COVID-19 protection: a prospective study , Molodtsov, 2021	“Explore the impact of T cells and to quantify immune responses...5,340 Moscow residents and cellular immune responses to SARS-CoV-2 to 300 days. The antibody and cellular responses their magnitude inversely correlated with the maximal level of protection was reached by individuals with antibodies of responses and by individuals with antibodies of antibodies provided an intermediate level
91) Anti- SARS-CoV-2 Receptor Binding Domain Antibody Evolution after mRNA Vaccination , Cho, 2021	“SARS-CoV-2 infection produces B-cell responses for at least one year. During that time, memory B cells potent antibodies that are resistant to mu
92) Seven-month kinetics of SARS-CoV-2 antibodies and role of pre-existing antibodies to human coronaviruses , Ortega, 2021	“Impact of pre-existing antibodies to human coronaviruses (HCoVs), is essential to understand how to devise effective surveillance strategies...antibody levels increase from ~150 days post-infection (73% for IgG), in the absence of any evidence HCoV are significantly higher in asymptomatic individuals. Thus, pre-existing cross-reactive protective effect against SARS-CoV-2 infection
93) Immunodominant T-cell epitopes from the SARS-CoV-2 spike antigen reveal robust pre-existing T-cell immunity in unexposed individuals , Mahajan, 2021	“Findings suggest that SARS-CoV-2 reactivity in many individuals because of prior exposure
94) Neutralizing Antibody Responses to Severe Acute Respiratory Syndrome Coronavirus 2 in Coronavirus Disease 2019 Inpatients and Convalescent Patients , Wang, 2020	“117 blood samples were collected from 70 convalescent patients...the neutralizing antibody

	early stage of disease, and a significant re patients.”
95) Not just antibodies: B cells and T cells mediate immunity to COVID-19 , Cox, 2020	“Reports that antibodies to SARS-CoV-2 a following recovery from the virus have ca antibodies in the serum does not necessa memory.”
96) T cell immunity to SARS-CoV-2 following natural infection and vaccination , DiPiazza, 2020	“Although T cell durability to SARS-CoV-2 data and past experience from human inf the potential for persistence and the capa host disease, and importance in vaccine-i
97) Durable SARS-CoV-2 B cell immunity after mild or severe disease , Ogega, 2021	“Multiple studies have shown loss of severe coronavirus 2-specific (SARS-CoV-2-speci infection, raising concern that humoral im durable. If immunity wanes quickly, millio reinfection after recovery from coronaviru memory B cells (MBCs) could provide dur neutralizing antibody titers decline... dat infected individuals develop S-RBD-speci resemble germinal center-derived B cells against other pathogens, providing evide immunity against SARS-CoV-2 after mild o
98) Memory T cell responses targeting the SARS coronavirus persist up to 11 years post-infection. , Ng, 2016	“All memory T cell responses detected tar proteins... these responses were found to infection... knowledge of the persistence targeting the viral structural proteins in S important.”
99) Adaptive immunity to SARS-CoV-2 and COVID-19 , Sette, 2021	“The adaptive immune system is importa The three fundamental components of th (the source of antibodies), CD4+ T cells, a to emerge that reveals that CD4+ T cells, C antibodies all contribute to control of SAR hospitalized cases of COVID-19.”
100) Early induction of functional SARS-CoV-2-specific T cells associates with rapid viral clearance and mild disease in COVID-19 patients , Tan, 2021	“These findings provide support for the p SARS-CoV-2-specific T cells with importan immune monitoring.”

<p>101) SARS-CoV-2-specific CD8⁺ T cell responses in convalescent COVID-19 individuals, Kared, 2021</p>	<p>“A multiplexed peptide-MHC tetramer ap CoV-2 candidate epitopes for CD8⁺ T cell r of 30 coronavirus disease 2019 convalesc demonstrated a coordinated and dynami decrease in inflammation, increase in neu differentiation of a specific CD8⁺ T cell res distinct differentiation into stem cell and which may be key to developing durable p</p>
<p>102) S Protein-Reactive IgG and Memory B Cell Production after Human SARS-CoV-2 Infection Includes Broad Reactivity to the S2 Subunit, Nguyen-Contant, 2021</p>	<p>“Most importantly, we demonstrate that i MBCs against the novel receptor binding of the SARS-CoV-2 spike protein. Thus, ev MBCs remain to mediate rapid antibody p suggest that SARS-CoV-2 infection strengt protection through S2-reactive antibody</p>
<p>103) Persistence of Antibody and Cellular Immune Responses in Coronavirus Disease 2019 Patients Over Nine Months After Infection, Yao, 2021</p>	<p>“A cross-sectional study to assess the viru and B cell responses in coronavirus disea days after infection...found that approxin detectable immunoglobulin (Ig)G antibod proteins and neutralizing antibodies agai patients had detectable IgG antibodies ag surrogate virus-neutralizing antibodies... cell and interferon-γ-secreting T cell resp 70% of patients...coronavirus 2-specific i most patients approximately 1 year after sign for prevention from reinfection and v</p>
<p>104) Naturally Acquired SARS-CoV-2 Immunity Persists for Up to 11 Months Following Infection, De Giorgi, 2021</p>	<p>“A prospective, longitudinal analysis of Co at multiple time points over an 11-month antibody levels change over time followin that immunological memory is acquired i SARS-CoV-2 and is sustained in a majority</p>
<p>105) Decreasing Seroprevalence of Measles Antibodies after Vaccination – Possible Gap in Measles Protection in Adults in the Czech Republic, Smetana, 2017</p>	<p>“A long-term high rate of seropositivity pe By contrast, it decreases over time after v concentrations of antibodies in persons w longer time at a higher level than in vacci</p>
<p>106) Broadly cross-reactive antibodies dominate the human B cell response against 2009 pandemic H1N1 influenza virus infection, Wrammert, 2011</p>	<p>“The expansion of these rare types of mer people did not become severely ill, even i protective antibody titers”...found “extra blood of nine people who caught the swin</p>

	it.”...unlike antibodies elicited by annual neutralizing antibodies induced by pande cross-reactive against epitopes in the hem domain of multiple influenza strains. The undergone extensive affinity maturation.
107) Reinfection With Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) in Patients Undergoing Serial Laboratory Testing , Qureshi, 2021	“Reinfection was identified in 0.7% (n = 63 .9%) during follow-up of 9119 patients wi
108) Distinct antibody and memory B cell responses in SARS-CoV-2 naïve and recovered individuals following mRNA vaccination , Goel, 2021	“Interrogated antibody and antigen-spec SARS-CoV-2 naïve and 11 SARS-CoV-2 rec recovered individuals, antibody and mem boosted after the first vaccine dose; howe circulating antibodies, neutralizing titers, after the second dose. This robust boosting correlated with levels of pre-existing mem identifying a key role for memory B cells i CoV-2 antigens.”
109) Covid-19: Do many people have pre-existing immunity? Doshi, 2020	“Six studies have reported T cell reactivity people with no known exposure to the vir specimens obtained in the US between 20 forms of T cell reactivity to SARS-CoV-2... they have made solid inroads into ascerta responses. “Our hypothesis, of course, wa coronaviruses, because they’re closely re is a true immune memory and it is derive
110) Pre-existing and <i>de novo</i> humoral immunity to SARS-CoV-2 in humans , Ng, 2020	“We demonstrate the presence of pre-exi and unexposed humans to the new coron antibodies were readily detectable by a se in SARS-CoV-2-uninfected individuals and children and adolescents.”
111) Phenotype of SARS-CoV-2-specific T-cells in COVID-19 patients with acute respiratory distress syndrome , Weiskopf, 2020	“We detected SARS-CoV-2-specific CD4 ⁺ a COVID-19 patients, respectively. We also c reactive T-cells in 20% of the healthy cont CoV-2 and indicative of cross-reactivity du coronaviruses.”

112) Pre-existing immunity to SARS-CoV-2: the knowns and unknowns , Sette, 2020	“T cell reactivity against SARS-CoV-2 was speculated that this reflects T cell memory to coronaviruses.”
113) Pre-existing immunity against swine-origin H1N1 influenza viruses in the general human population , Greenbaum, 2009	“Memory T-cell immunity against S-OIV is similar to that of seasonal H1N1 influenza...the conservation of T-cell epitopes suggests that the severity of an S-OIV infection is influenced by the susceptibility of the virus to immune attack and the severity of seasonal flu.”
114) Cellular immune correlates of protection against symptomatic pandemic influenza , Sridhar, 2013	“The 2009 H1N1 pandemic (pH1N1) provided an opportunity to determine whether cross-reactive cellular immunity is important in antibody-naïve individuals... Higher frequencies of conserved CD8 epitopes were found in individuals with severe illness, with total symptom score having a positive correlation with the frequency of interferon- γ (IFN- γ)(+) in CD8(+) T cells (0.6, P = 0.004)... CD8(+) T cells specific to conserved epitopes were associated with cross-protection against symptomatic infection.”
115) Preexisting influenza-specific CD4+ T cells correlate with disease protection against influenza challenge in humans , Wilkinson, 2012	“Precise role of T cells in human influenza infection is unclear. In influenza infection studies in healthy volunteers, exposure to the challenge viruses H3N2 or H1N1... resulted in similar responses before and during infection...found a large increase in CD4+ T cells responding by day 7, when virus was completely cleared. Serum antibodies were still undetectable at day 7. CD4+ T cells responding to influenza internal proteins were associated with shedding and less severe illness. These CD4+ T cells responded to H1N1 (A/CA/07/2009) peptides and showed cross-reactivity with H3N2 peptides.”
116) Serum cross-reactive antibody response to a novel influenza A (H1N1) virus after vaccination with seasonal influenza vaccine , CDC, MMWR, 2009	“No increase in cross-reactive antibody response to a novel (H1N1) virus was observed among adults who had been vaccinated that receipt of recent (2005–2009) seasonal influenza vaccine elicited a protective antibody response to the challenge virus.”
117) No one is naive: the significance of heterologous T-cell immunity , Welsh, 2002	“Memory T cells that are specific for one virus can provide protective immunity and immunopathology in a second infection influenced by the T-cell memory pool that is shaped by the history of previous infections, and with each new infection memory to previously encountered agents is maintained.”

124) The longitudinal kinetics of antibodies in COVID-19 recovered patients over 14 months , Eyrar, 2020	“Found a significantly faster decay in naïve patients suggesting that the serological memory is more robust compared to vaccination. Our results suggest a difference between serological memory induced by
125) Continued Effectiveness of COVID-19 Vaccination among Urban Healthcare Workers during Delta Variant Predominance , Lan, 2021	“Followed a population of urban Massachusetts healthcare workers for infection among those with prior COVID-19 infection, free person-days, adding to the evidence of durable acquired immunity.”
126) Immunity to COVID-19 in India through vaccination and natural infection , Sarraf, 2021	“Compared the vaccination induced immunity to that of natural infection, evaluating thereby if individuals retained virus specific immunity...the overall response to natural infection in and around Kolkata is stronger than that generated by vaccination, especially in terms of but cell mediated immunity to SARS-CoV-2 after the viral infection.”
127) Asymptomatic or mild symptomatic SARS-CoV-2 infection elicits durable neutralizing antibody responses in children and adolescents , Garrido, 2021	“Evaluated humoral immune responses in children with asymptomatic or mild symptomatic SARS-CoV-2 infection. IgM, IgG, and IgA antibody responses to a panel of antigens at the time of acute infection and 2 and 4 months later in 100 participants. Notably, these antibody responses correlated with neutralizing activity that was still detectable in 94% of children. Moreover, antibody responses in children and adolescents were comparable to those in sera from 24 adults with mild symptomatic infection. Findings indicate that children and adolescents with SARS-CoV-2 infection generate robust and durable antibody responses that can likely contribute to protection from reinfection.
128) T cell response to SARS-CoV-2 infection in humans: A systematic review , Shrotri, 2021	“Symptomatic adult COVID-19 cases consistently show lymphopenia, which positively correlates with the duration of RNA positivity, and non-surviving paediatric cases display preserved counts. Paediatric cases generally develop more robust, virus-specific memory and effector function has been demonstrated for CD4+ T cell epitopes, and, cross-reactive T cell responses in unexposed and uninfected adults, but the extent of susceptibility, respectively, remains unclear.
129) Severity of SARS-CoV-2 Reinfections as Compared with Primary Infections , Abu-Raddad, 2021	“Reinfections had 90% lower odds of resulting in severe primary infections. Four reinfections were

	hospitalization. None led to hospitalization. Reinfections were rare and were generally mild, suggesting a robust immune system after primary infection.”
130) Assessment of the Risk of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) Reinfection in an Intense Re-exposure Setting , Abu-Raddad, 2021	“SARS-CoV-2 reinfection can occur but is rare due to protective immunity against reinfection that develops after primary infection.”
131) Increased risk of infection with SARS-CoV-2 Beta, Gamma, and Delta variant compared to Alpha variant in vaccinated individuals , Andeweg, 2021	“Analyzed 28,578 sequenced SARS-CoV-2 immune status obtained through national surveillance in the Netherlands from March to August 2021. The risk of infection by the Beta (B.1.351), Gamma (B.1.1.7), and Delta (B.1.1.6) variant compared to the Alpha (B.1.1.7) variant was not significantly different. However, the risk of infection by the Beta (B.1.351) variant was significantly higher 14 days after complete vaccination compared to the Alpha (B.1.1.7) variant. However, vaccine-induced immunity, no increased risk of infection by Beta or Delta variants relative to Alpha variant was observed in infection-induced immunity.”
132) Prior COVID-19 protects against reinfection, even in the absence of detectable antibodies , Breathnach, 2021	“Studies did not address whether prior infection without a detectable humoral immune response. In the absence of an antibody deficiency syndrome and reduced humoral response to COVID-19...Although there have been few studies, data show that such individuals generate robust T cell responses against SARS-CoV-2 peptide pools...SARS-CoV-2 T cell responses but not neutralising antibodies are associated with severity suggesting the immune system may compensate following COVID-19...our results suggest that detectable serum antibody may be a marker of protection against reinfection. This could have implications for vaccine making, for example if using seroprevalence as a marker of immunity, or if serum antibody levels were used to assess immunity – a minority of truly immune people could be disadvantaged as a result. Call for further studies of immune correlates of protection against SARS-CoV-2, which may in turn enhance development of treatments.”
133) Natural infection vs vaccination: Which gives more protection? , Rosenberg, 2021	“With a total of 835,792 Israelis known to have been infected with COVID...By contrast, Israelis were more likely to get infected after the shot than before.”

	3,000 of the 5,193,499, or 0.0578%, of Israel infected in the latest wave.”
134) Community transmission and viral load kinetics of the SARS-CoV-2 delta (B.1.617.2) variant in vaccinated and unvaccinated individuals in the UK: a prospective, longitudinal, cohort study , Singanayagam, 2021	“Nonetheless, fully vaccinated individuals had a peak viral load similar to unvaccinated cases following infection in household settings, including
135) Antibodies elicited by mRNA-1273 vaccination bind more broadly to the receptor binding domain than do those from SARS-CoV-2 infection , Greaney, 2021	“The neutralizing activity of vaccine-elicited antibodies to the receptor-binding domain (RBD) of the virus was similar to antibodies elicited by natural infection. The binding of vaccine-elicited antibodies was more broadly neutralizing compared to infection-elicited antibodies. Single RBD mutations have less impact on vaccine-elicited antibodies compared to convalescent sera. Therefore, the impact of natural infection or different modes of vaccination on the susceptibility to erosion by SARS-CoV-2 e
136) Antigen-Specific Adaptive Immunity to SARS-CoV-2 in Acute COVID-19 and Associations with Age and Disease Severity , Moderbacher, 2020	“Limited knowledge is available on the relationship between immune responses and COVID-19 disease severity. Examination of all three branches of adaptive immunity: CoV-2-specific CD4+ and CD8+ T cell and neutralizing antibody acute and convalescent subjects. SARS-CoV-2 were each associated with milder disease severity. Adaptive immune responses were associated with better outcomes. Roles for both CD4+ and CD8+ T cells in protection. Notably, coordination of SARS-CoV-2 antibody responses in individuals ≥ 65 years old. Scarcity of neutralizing antibody aging and poor disease outcomes. A parsimonious coordinated CD4+ T cell, CD8+ T cell, and neutralizing antibody but uncoordinated responses frequently fail to establish a connection between aging and impaired outcomes to CoV-2.”
137) Protection and waning of natural and hybrid COVID-19 immunity , Goldberg, 2021	“Protection from reinfection decreases with time, is, nevertheless, higher than that conferred by vaccination at a similar time since the last immunity-conf
138) A Systematic Review of the Protective Effect of Prior SARS-CoV-2 Infection on Repeat Infection , Kojima, 202	“The protective effect of prior SARS-CoV-2 infection was similar to the protective effect of vaccination

<p>139) High-affinity memory B cells induced by SARS-CoV-2 infection produce more plasmablasts and atypical memory B cells than those primed by mRNA vaccines, Pape, 2021</p>	<p>“Compare SARS-CoV-2 spike receptor binding to primary MBCs that form in response to infection. Both primary MBC populations have similar affinity. Both primary MBC populations have similar affinity to respond to a second S1-RBD exposure by producing an abundant immunoglobulin (Ig)A+ subclass. Both are mostly IgG+ and cross-react with the B.1.1.7. Infection-induced primary MBCs have better antigen-specificity than plasmablasts and secondary MBCs of the same age as vaccine-induced primary MBCs. Our results suggest that primary MBCs have undergone more affinity maturation than primary MBCs and produce more robust secondary MBCs.</p>
<p>140) Differential antibody dynamics to SARS-CoV-2 infection and vaccination, Chen, 2021</p>	<p>“Optimal immune responses furnish long-term protection and are protective across dynamically mutating variants. The robustness of mRNA vaccine-induced immunity is characterized by durability and breadth after SARS-CoV-2 infection. mRNA vaccination delivered robust initial virus-specific antibody variant coverage, pre-variant SARS-CoV-2 infection was modest in magnitude, showed highly stable antibody dynamics...Differential antibody durability was observed in recovered subjects with dual memory B cell populations. Somatic mutation and cross-coronavirus infection mediated antibody breadth advantage and durability-enhancing function conferred by mRNA vaccination.</p>
<p>141) Children develop robust and sustained cross-reactive spike-specific immune responses to SARS-CoV-2 infection, Dowell, 2022</p>	<p>“Compare antibody and cellular immunity in children and adults. Antibody responses against spike protein in children seroconversion boosted responses against SARS-CoV-2 through cross-recognition of the S2 domain. Antibody responses comparable between children and adults. Children have more than twice as high in children and were seronegative children, indicating pre-existing immunity to seasonal coronaviruses. Importantly, children have robust responses 6 months after infection, where adults have waned. Spike-specific responses were also broad. Therefore, children generate robust, cross-reactive antibody responses to SARS-CoV-2 with focused spike protein. These findings provide insight into the relative contribution of children and might help to guide the design of future vaccines.</p>
<p>142) Severity of SARS-CoV-2 Reinfections as Compared with Primary Infections, Abu-Raddad, 2021</p>	<p>Abu-Raddad et al. has recently published a study on reinfections as compared with primary infections.</p>

	<p>studies, they assessed the efficacy of prev against reinfection with SARS-CoV-2 as be person who has already had a primary inf reinfection is only approximately 1% of th person having a severe primary infection. resulting in hospitalization or death than were severe enough to lead to acute care hospitalization in an ICU, and none ended were generally mild, perhaps because of t primary infection.”</p>
<p>143) SARS-CoV-2 spike T cell responses induced upon vaccination or infection remain robust against Omicron, Keeton, 2021</p>	<p>“Assessed the ability of T cells to react with were vaccinated with Ad26.CoV2.S or BNT convalescent COVID-19 patients (n = 70). V CD8 T cell response to spike was maintain the magnitude of Omicron cross-reactive and Delta variants, despite Omicron harb Additionally, in Omicron-infected hospita comparable T cell responses to ancestral proteins to those found in patients hospit by the ancestral, Beta or Delta variants (n despite Omicron’s extensive mutations and neutralizing antibodies, the majority of T or natural infection, cross-recognises the immunity to Omicron is likely to contribu supporting early clinical observations fro</p>
<p>144) Pre-existing immunity against swine-origin H1N1 influenza viruses in the general human population, Greenbaum,2009</p>	<p>“69% (54/78) of the epitopes recognized b invariant. We further demonstrate experie immunity against S-OIV is present in the a memory is of similar magnitude as the pre H1N1 influenza. Because protection from vaccine based on the specific S-OIV HA an to prevent infection. However, T cells are Therefore, the conservation of a large frac the severity of an S-OIV infection, as far as the virus to immune attack, would not dif These results are consistent with reports mortality rates associated with human S- reported in the literature and present in r also found totally conserved in S-OIV. Inte epitopes varied greatly as a function of th</p>

	<p>Although only 31% of the B-cell epitopes and 69% of the CD8+ T-cell epitopes were conserved, T-cell immune responses can exist even for influenza A strains (14, 15). Based on this and the above, we hypothesized that it is possible that protective immunity against S-OIV exist in the adult population.</p>
<p>145) Protection afforded by prior infection against SARS-CoV-2 reinfection with the Omicron, variant, Altarawneh, 2021</p>	<p>“<i>PES</i> against symptomatic reinfection was 97.6% for Alpha, 84.8% (95% CI: 74.5-91.0) for Delta, and 56.0% (95% CI: 50.6-60.9) for Omicron. Of 10 and 2 Omicron reinfections progressed to critical or fatal COVID-19. <i>PES</i> against hospitalization from reinfection was estimated at 69.4% (95% CI: 50.7-97.1) for Beta, 100% (95% CI: 43.3-100) for Delta, 47.5-97.1) for Omicron.”</p>
<p>146) Cross-reactive memory T cells associate with protection against SARS-CoV-2 infection in COVID-19 contacts, Kundu, 2022</p>	<p>“Observe higher frequencies of cross-reactive memory T cells (p = 0.0355) IL-2-secreting memory T cells (p = 0.0355) in PCR-negative despite exposure (n = 26), who later convert to PCR-positive (n = 26); no significant difference in responses to spike is observed, hinting at cross-reactive T cells. Our results are thus consistent with spike cross-reactive memory T cells protecting against reinfection, thereby supporting the inclusion of T cell adjuvants in generation vaccines.”</p>
<p>147) Long-Term Persistence of IgG Antibodies in recovered COVID-19 individuals at 18 months and the impact of two-dose BNT162b2 (Pfizer-BioNTech) mRNA vaccination on the antibody response, Dehgani-Mobaraki, 2021</p>	<p>“At 18 months, 97% participants tested positive for the persistence of infection-induced immune response in individuals.”</p> <p>“Enrolled 412 adults mostly with mild or moderate COVID-19. At study visit, subjects donated peripheral blood. SARS-CoV-2 IgG antibodies were identified in 215/412 (52.2%) and 274/412 (66.5 %) positive IFN-γ release and neutralization. In respect to time after infection, both IgG and IFN-γ concentrations decreased by about half. Statistically, IgG and IFN-γ production were significantly lower on individual basis we observed patients with higher initial titers.”</p>

	<p>γ levels and vice versa. Our data suggest that antibodies were acquired in most individuals after infection and that the majority of patients for at least 10 months</p>
<p>148) Long-term course of humoral and cellular immune responses in outpatients after SARS-CoV-2 infection, Schiffner, 2021</p>	<p>“Enrolled 412 adults mostly with mild or moderate disease. At study visit, subjects donated peripheral blood. SARS-CoV-2 IgG antibodies and IFN-γ release after SARS-CoV-2 stimulation. SARS-CoV-2 IgG antibodies were identified in 215/412 (52.2%) and 215/412 (52.2%) had positive neutralization. 274/412 (66.5 %) positive IFN-γ release and 274/412 (66.5 %) positive IFN-γ release and 274/412 (66.5 %) positive IFN-γ release. In respect to time after infection, both IgG and IFN-γ concentrations decreased by about half. Statistically, IgG and IFN-γ production were higher on an individual basis we observed patients with high IFN-γ levels and vice versa. Our data suggest that antibodies were acquired in most individuals after infection and that the majority of patients for at least 10 months</p>
<p>149) COVID-19 Cases and Hospitalizations by COVID-19 Vaccination Status and Previous COVID-19 Diagnosis — California and New York, May–November 2021, Leon, 2022</p>	<p>“By the week beginning October 3, compared with unvaccinated persons without a previous COVID-19 diagnosis, among vaccinated persons without a previous COVID-19 diagnosis, the risk of hospitalization was 4.5-fold (California) and 4.5-fold (New York) lower among both groups with previous COVID-19 diagnosis (California) and 14.7-fold lower (New York) among vaccinated persons with a previous COVID-19 diagnosis. In California, the risk of hospitalization was 32.5-fold lower among vaccinated persons with a previous COVID-19 diagnosis in the same period, compared with hospitalization among unvaccinated persons without a previous COVID-19 diagnosis. In New York, California followed a similar pattern. These findings suggest that vaccination protects against COVID-19 and that surviving a previous infection protects against COVID-19 hospitalization. Importantly, infection-derived immunity against the Delta variant became predominant, a time when many persons declined because of immunity.”</p>
<p>150) Prevalence and Durability of SARS-CoV-2 Antibodies Among Unvaccinated US Adults by History of COVID-19, Alejo, 2022</p>	<p>“In this cross-sectional study of unvaccinated US adults, SARS-CoV-2 antibodies were detected in 99% of individuals who reported a previous COVID-19 infection, 55% who believed they had COVID-19 but had not been tested, and 1% who believed they had never had COVID-19 infection. The durability of antibodies after a positive COVID-19 test result up to 12 months was 99%.”</p>



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Covid-19: politicisation, “corruption,” and suppression of science

When good science is suppressed by the medical-political complex, people die

Kamran Abbasi *executive editor*

Politicians and governments are suppressing science. They do so in the public interest, they say, to accelerate availability of diagnostics and treatments. They do so to support innovation, to bring products to market at unprecedented speed. Both of these reasons are partly plausible; the greatest deceptions are founded in a grain of truth. But the underlying behaviour is troubling.

Science is being suppressed for political and financial gain. Covid-19 has unleashed state corruption on a grand scale, and it is harmful to public health.¹ Politicians and industry are responsible for this opportunistic embezzlement. So too are scientists and health experts. The pandemic has revealed how the medical-political complex can be manipulated in an emergency—a time when it is even more important to safeguard science.

The UK's pandemic response provides at least four examples of suppression of science or scientists. First, the membership, research, and deliberations of the Scientific Advisory Group for Emergencies (SAGE) were initially secret until a press leak forced transparency.² The leak revealed inappropriate involvement of government advisers in SAGE, while exposing under-representation from public health, clinical care, women, and ethnic minorities. Indeed, the government was also recently ordered to release a 2016 report on deficiencies in pandemic preparedness, Operation Cygnus, following a verdict from the Information Commissioner's Office.^{3 4}

Next, a Public Health England report on covid-19 and inequalities. The report's publication was delayed by England's Department of Health; a section on ethnic minorities was initially withheld and then, following a public outcry, was published as part of a follow-up report.^{5 6} Authors from Public Health England were instructed not to talk to the media. Third, on 15 October, the editor of the *Lancet* complained that an author of a research paper, a UK government scientist, was blocked by the government from speaking to media because of a “difficult political landscape.”⁷

Now, a new example concerns the controversy over point-of-care antibody testing for covid-19.⁸ The prime minister's Operation Moonshot depends on immediate and wide availability of accurate rapid diagnostic tests.⁹ It also depends on the questionable logic of mass screening—currently being trialled in Liverpool with a suboptimal PCR test.^{10 11}

The incident relates to research published this week by *The BMJ*, which finds that the government procured an antibody test that in real world tests falls well short of performance claims made by its manufacturers.^{12 13} Researchers from Public Health

England and collaborating institutions sensibly pushed to publish their study findings before the government committed to buying a million of these tests but were blocked by the health department and the prime minister's office.¹⁴ Why was it important to procure this product without due scrutiny? Prior publication of research on a preprint server or a government website is compatible with *The BMJ*'s publication policy. As if to prove a point, Public Health England then unsuccessfully attempted to block *The BMJ*'s press release about the research paper.

Politicians often claim to follow the science, but that is a misleading oversimplification. Science is rarely absolute. It rarely applies to every setting or every population. It doesn't make sense to slavishly follow science or evidence. A better approach is for politicians, the publicly appointed decision makers, to be informed and guided by science when they decide policy for their public. But even that approach retains public and professional trust only if science is available for scrutiny and free of political interference, and if the system is transparent and not compromised by conflicts of interest.

Suppression of science and scientists is not new or a peculiarly British phenomenon. In the US, President Trump's government manipulated the Food and Drug Administration to hastily approve unproved drugs such as hydroxychloroquine and remdesivir.¹⁵ Globally, people, policies, and procurement are being corrupted by political and commercial agendas.¹⁶

The UK's pandemic response relies too heavily on scientists and other government appointees with worrying competing interests, including shareholdings in companies that manufacture covid-19 diagnostic tests, treatments, and vaccines.¹⁷ Government appointees are able to ignore or cherry pick science—another form of misuse—and indulge in anti-competitive practices that favour their own products and those of friends and associates.¹⁸

How might science be safeguarded in these exceptional times? The first step is full disclosure of competing interests from government, politicians, scientific advisers, and appointees, such as the heads of test and trace, diagnostic test procurement, and vaccine delivery. The next step is full transparency about decision making systems, processes, and knowing who is accountable for what.

Once transparency and accountability are established as norms, individuals employed by government should ideally only work in areas unrelated to their competing interests. Expertise is possible without competing interests. If such a strict rule becomes impractical, minimum good practice is that people

with competing interests must not be involved in decisions on products and policies in which they have a financial interest.

Governments and industry must also stop announcing critical science policy by press release. Such ill judged moves leave science, the media, and stock markets vulnerable to manipulation. Clear, open, and advance publication of the scientific basis for policy, procurements, and wonder drugs is a fundamental requirement.¹⁹

The stakes are high for politicians, scientific advisers, and government appointees. Their careers and bank balances may hinge on the decisions that they make. But they have a higher responsibility and duty to the public. Science is a public good. It doesn't need to be followed blindly, but it does need to be fairly considered. Importantly, suppressing science, whether by delaying publication, cherry picking favourable research, or gagging scientists, is a danger to public health, causing deaths by exposing people to unsafe or ineffective interventions and preventing them from benefiting from better ones. When entangled with commercial decisions it is also maladministration of taxpayers' money.

Politicisation of science was enthusiastically deployed by some of history's worst autocrats and dictators, and it is now regrettably commonplace in democracies.²⁰ The medical-political complex tends towards suppression of science to aggrandise and enrich those in power. And, as the powerful become more successful, richer, and further intoxicated with power, the inconvenient truths of science are suppressed. When good science is suppressed, people die.

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- 1 Geoghegan P. Cronyism and clientelism. *London Review of Books* 2020 Nov 5. <https://www.lrb.co.uk/the-paper/v42/n21/peter-geoghegan/cronyism-and-clientelism>
- 2 Scally G, Jacobson B, Abbasi K. The UK's public health response to covid-19. *BMJ* 2020;369:m1932. doi: 10.1136/bmj.m1932 pmid: 32414712
- 3 Iacobucci G. Pandemic preparedness: Government must release 2016 report, says information commissioner. *BMJ* 2020;371:m3953. doi: 10.1136/bmj.m3953 pmid: 33046458
- 4 Department of Health and Social Care. Policy paper. Annex B: Exercise Cygnus report. 5 Nov 2020. <https://www.gov.uk/government/publications/uk-pandemic-preparedness/exercise-cygnus-report-accessible-report>
- 5 Public Health England. Disparities in the risk and outcomes of COVID-19. 2020. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/908434/Disparities_in_the_risk_and_outcomes_of_COVID_August_2020_update.pdf
- 6 Khunti K, Platt L, Routen A, Abbasi K. Covid-19 and ethnic minorities: an urgent agenda for overdue action. *BMJ* 2020;369:m2503. doi: 10.1136/bmj.m2503 pmid: 32576558
- 7 Horton R. Tweet, 15 Oct 2020. <https://twitter.com/richardhorton1/status/1316711967554506753>
- 8 Boseley S. Antibody tests bought by UK government "less accurate than maker claims." *Guardian* 2020 Nov 12. <https://www.theguardian.com/world/2020/nov/12/covid-antibody-test-bought-uk-government-less-accurate-than-makers-claim>
- 9 Iacobucci G, Coombes R. Covid-19: Government plans to spend £100bn on expanding testing to 10 million a day. *BMJ* 2020;370:m3520. doi: 10.1136/bmj.m3520 pmid: 32907851
- 10 Iacobucci G. Covid-19: mass population testing is rolled out in Liverpool. *BMJ* 2020;371:m4268. doi: 10.1136/bmj.m4268 pmid: 33144291
- 11 Iacobucci G. Covid-19: rapid test missed over 50% of positive cases in Manchester pilot. *BMJ* 2020;371:m4323. doi: 10.1136/bmj.m4323 pmid: 33158908
- 12 Mulchandani R, Jones HE, Taylor-Phillips S, et al. EDSAB-HOME and COMPARE Investigators. Accuracy of UK Rapid Test Consortium (UK-RTC) "AbC-19 Rapid Test" for detection of previous SARS-CoV-2 infection in key workers: test accuracy study. *BMJ* 2020;371:m4262. doi: 10.1136/bmj.m4262 pmid: 33177070
- 13 Gill D, Ponsford MJ. Testing for antibodies to SARS-CoV-2. *BMJ* 2020;371:m4288. doi: 10.1136/bmj.m4288
- 14 Armstrong S. Covid-19: Government buried negative data on its favoured antibody test. *BMJ* 2020;371:m4353. doi: 10.1136/bmj.m4353
- 15 Cohen K, Kupferschmidt K. The "very, very bad look" of remdesivir, the first FDA-approved COVID-19 drug. *Science* 2020 Oct 28. <https://www.sciencemag.org/news/2020/10/very-very-bad-look-remdesivir-first-fda-approved-covid-19-drug>
- 16 Transparency International. Corruption and covid-19—the story so far. 8 Jul 2020. <https://www.transparency.org.uk/corruption-coronavirus-covid-19-latest>
- 17 Ennals E. Government test tsar has £770,000 shares in drugs firm that sold us £13million of "pointless" antibody screening kits—after it emerged that Sir Patrick Vallance has a financial interest in company racing to find vaccine. *Daily Mail* 2020 Sep 26. <https://www.dailymail.co.uk/news/article-8776339/Test-tsar-770-000-shares-firm-sold-13million-pointless-antibody-screening-kits.html>
- 18 Armstrong S. Covid-19: Government faces legal action over £75m contract for antibody tests. *BMJ* 2020;371:m4427. doi: 10.1136/bmj.m4427
- 19 Mahase E. Covid-19: Vaccine candidate may be more than 90% effective, interim results indicate. *BMJ* 2020;371:m4347. doi: 10.1136/bmj.m4347 pmid: 33168562
- 20 Bollyky TJ, Kickbusch I. Preparing democracies for pandemics. *BMJ* 2020;371:m4088. doi: 10.1136/bmj.m4088 pmid: 33097482

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Enrolled House Bill 2359

Sponsored by Representatives SALINAS, RUIZ, Senator FREDERICK; Representatives ALONSO LEON, BYNUM, CAMPOS, DEXTER, GRAYBER, LEIF, NOSSE, PHAM, REYNOLDS, SANCHEZ, SCHOUTEN, SOLLMAN, VALDERRAMA (Presession filed.)

CHAPTER

AN ACT

Relating to health care interpreters; creating new provisions; amending ORS 413.550, 413.552, 413.556, 413.558, 414.572, 656.027 and 657.046; repealing ORS 657.048; and declaring an emergency.

Whereas current law contains a loophole for health care providers and interpretation service companies to justify working with untrained health care interpreters despite the availability of health care interpreters who are qualified or certified by the Oregon Health Authority; and

Whereas current law does not hold accountable health care providers and interpretation service companies for failing to work with qualified or certified interpreters or for failing to work with best practices in providing health care interpretation services; and

Whereas there is currently no complaint process for health care interpreters who experience wage or other labor violations; and

Whereas there is a growing demand for health care interpreters in rural communities in this state, especially for interpreters capable of interpreting languages of limited diffusion in those areas; and

Whereas health care interpreters suffer from the inequitable business practices of interpretation service companies; and

Whereas due to the low payment rates and the rising cost of training and testing, current and potential health care interpreters are reluctant to invest in training, testing, qualification or certification because of the low return on their investment; and

Whereas there is a lack of uniformity statewide in the quality of health care interpretation services; and

Whereas there is a lack of a uniform training curriculum statewide; now, therefore,

Be It Enacted by the People of the State of Oregon:

SECTION 1. Section 2 of this 2021 Act is added to and made a part of ORS 413.550 to 413.558.

SECTION 2. (1) Except as provided in subsection (2) of this section, a health care provider shall work with a health care interpreter from the health care interpreter registry administered by the Oregon Health Authority under ORS 413.558 when communicating with a patient who prefers to communicate in a language other than English, unless the health care provider is a doctor or clinician who is proficient in the patient's preferred language.

(2) A health care provider who is otherwise required to work with a health care interpreter from the health care interpreter registry may work with a health care interpreter who is not listed on the health care interpreter registry only if the provider:

(a) Verifies, in the manner prescribed by rule by a board or agency described in section 3 of this 2021 Act, that the provider has taken appropriate steps needed to obtain a health care interpreter from the health care interpreter registry in accordance with rules adopted by the authority under ORS 413.558; or

(b) Has offered the patient the services of a health care interpreter from the health care interpreter registry and the patient declined the offer and chose a different interpreter.

(3) A health care provider shall give personal protective equipment, consistent with established national standards, to health care interpreters providing services on-site at no cost to the health care interpreter and may not suggest to the health care interpreter that the health care interpreter should procure the health care interpreter's own personal protective equipment as a condition of working with the health care provider.

(4) A health care provider shall maintain records of each patient encounter in which the provider worked with a health care interpreter from the health care interpreter registry. The records must include:

(a) The name of the health care interpreter;

(b) The health care interpreter's registry number; and

(c) The language interpreted.

(5) The boards and agencies described in section 3 of this 2021 Act shall adopt rules to carry out the provisions of this section, which may include additional exemptions under subsection (2) of this section.

SECTION 3. Section 2 of this 2021 Act may be enforced by any means permitted under law by:

(1) A health professional regulatory board with respect to a health care provider under the jurisdiction of the board.

(2) The Oregon Health Authority or the Department of Human Services with regard to health care providers or facilities regulated by the authority or the department and health care providers enrolled in the medical assistance program.

(3) The authority with regard to emergency medical services providers licensed under ORS 682.216 and clinical laboratories licensed under ORS 438.110.

SECTION 4. (1) An interpretation service company operating in this state:

(a) Except as provided in paragraph (b) of this subsection, may not arrange for a health care interpreter to provide interpretation services in health care settings if the health care interpreter is not listed on the health care interpreter registry described in ORS 413.558.

(b) May arrange for a health care interpreter who is not listed on the health care interpreter registry to provide interpretation services in health care settings only if:

(A) A health care provider represents to the interpretation service company that the health care provider:

(i) Has taken appropriate steps necessary to arrange for a health care interpreter from the health care interpreter registry in the manner prescribed by rule under section 2 of this 2021 Act; and

(ii) Was unable to arrange for a health care interpreter from the health care interpreter registry; and

(B) The interpretation service company does not employ a health care interpreter listed on the health care interpreter registry who is available to provide interpretation services to the health care provider.

(c) May not represent to a health care provider that a contracted or employed health care interpreter referred by the company is a certified health care interpreter unless the interpreter has met the requirements for certification under ORS 413.558 and has been issued a valid certification by the authority.

(d) May not require or suggest to a health care interpreter that the health care interpreter procure the health care interpreter's own personal protective equipment as a condition of receiving a referral.

(2) An interpretation service company shall maintain records of each encounter in which the company refers to a health care provider worked with a health care interpreter from the health care interpreter registry or a health care interpreter who is not on the registry. The records must include:

- (a) The name of the health care interpreter; and
- (b) The health care interpreter's registry number, if applicable.

SECTION 5. Section 6 of this 2021 Act is added to and made a part of ORS chapter 414.

SECTION 6. (1) As used in this section:

- (a) "Certified health care interpreter" has the meaning given that term in ORS 413.550.
- (b) "Qualified health care interpreter" has the meaning given that term in ORS 413.550.

(2) The Oregon Health Authority shall adopt rules to ensure that a coordinated care organization, in accordance with ORS 414.572 (2)(e), and any other health care provider that is reimbursed for the cost of health care by the state medical assistance program:

(a) Works with a certified health care interpreter or a qualified health care interpreter when interacting with a recipient of medical assistance, or a caregiver of a recipient of medical assistance, who has limited English proficiency or who communicates in signed language; and

(b) Is reimbursed for the cost of the certified health care interpreter or qualified health care interpreter.

SECTION 7. (1) As used in this section, "health care interpreter" has the meaning given that term in ORS 413.550.

(2) The Oregon Health Authority shall, in collaboration with the Oregon Council on Health Care Interpreters and health care interpreters, conduct a study:

(a) Of the best model for an online platform for patients and health care providers to contract with health care interpreters and on how to use state and federal funds to finance the platform, to be completed no later than July 1, 2022; and

(b) Regarding sight translation as it pertains to the definition of "health care interpreter" in ORS 413.550 and related best practices.

(3) No later than January 1, 2022, the authority shall report to the interim committees of the Legislative Assembly related to health the results of the studies described in subsection (2) of this section and recommendations for legislative changes, if necessary, to implement the findings of the studies.

SECTION 8. ORS 413.550 is amended to read:

413.550. As used in ORS 413.550 to 413.558:

(1) "Certified health care interpreter" means an individual who has been approved and certified by the Oregon Health Authority **under ORS 413.558.**

(2) **"Coordinated care organization" has the meaning given that term in ORS 414.025.**

[(2)] (3) "Health care" means medical, surgical, **oral** or hospital care or any other remedial care recognized by state law, including physical and behavioral health care.

[(3)] (4)(a) "Health care interpreter" means an individual who is readily able to:

[(a)] (A) **Communicate in English and** communicate with a person with limited English proficiency **or who communicates in signed language;**

[(b)] (B) Accurately interpret the oral statements of a person with limited English proficiency, or the statements of a person who communicates in [sign] **signed** language, into English;

(C) **Accurately interpret oral statements in English to a person with limited English proficiency or who communicates in signed language;**

[(c)] (D) Sight translate documents from a person with limited English proficiency; **and**

[(d)] (E) Interpret the oral statements of other persons into the language of the person with limited English proficiency or into [sign] **signed** language[; and].

[*(e) Sight translate documents in English into the language of the person with limited English proficiency.*]

(b) “Health care interpreter” also includes an individual who can provide the services described in paragraph (a) of this subsection using relay or indirect interpretation.

(5) “Health care interpreter registry” means the registry described in ORS 413.558 that is administered by the authority.

(6) “Health care provider” means any of the following that are reimbursed with public funds, in whole or in part:

(a) An individual licensed or certified by the:

(A) State Board of Examiners for Speech-Language Pathology and Audiology;

(B) State Board of Chiropractic Examiners;

(C) State Board of Licensed Social Workers;

(D) Oregon Board of Licensed Professional Counselors and Therapists;

(E) Oregon Board of Dentistry;

(F) State Board of Massage Therapists;

(G) Oregon Board of Naturopathic Medicine;

(H) Oregon State Board of Nursing;

(I) Oregon Board of Optometry;

(J) State Board of Pharmacy;

(K) Oregon Medical Board;

(L) Occupational Therapy Licensing Board;

(M) Oregon Board of Physical Therapy;

(N) Oregon Board of Psychology;

(O) Board of Medical Imaging;

(P) State Board of Direct Entry Midwifery;

(Q) Respiratory Therapist and Polysomnographic Technologist Licensing Board;

(R) Board of Registered Polysomnographic Technologists;

(S) Board of Licensed Dietitians; and

(T) State Mortuary and Cemetery Board;

(b) An emergency medical services provider licensed by the Oregon Health Authority under ORS 682.216;

(c) A clinical laboratory licensed under ORS 438.110;

(d) A health care facility as defined in ORS 442.015;

(e) A home health agency licensed under ORS 443.015;

(f) A hospice program licensed under ORS 443.860; or

(g) Any other person that provides health care or that bills for or is compensated for health care provided, in the normal course of business.

(7) “Interpretation service company” means an entity, or a person acting on behalf of an entity, that is in the business of arranging for health care interpreters to work with health care providers in this state.

[*(4)*] (8) “Person with limited English proficiency” means a person who, by reason of place of birth or culture, [*speaks*] **communicates in** a language other than English and does not [*speak*] **communicate in** English with adequate ability to communicate effectively with a health care provider.

(9) “Prepaid managed care health services organization” has the meaning given that term in ORS 414.025.

[*(5)*] (10) “Qualified health care interpreter” means an individual who has [*received*] **been issued** a valid letter of qualification from the authority **under ORS 413.558**.

[*(6)*] (11) “Sight translate” means to translate a written document into spoken or [*sign*] **signed** language.

SECTION 9. ORS 413.552 is amended to read:

413.552. (1) The Legislative Assembly finds that persons with limited English proficiency, or who communicate in [sign] **signed** language, are often unable to interact effectively with health care providers. Because of language differences, persons with limited English proficiency, or who communicate in [sign] **signed** language, are often excluded from health care services, experience delays or denials of health care services or receive health care services based on inaccurate or incomplete information.

(2) The Legislative Assembly further finds that the lack of competent health care interpreters among health care providers impedes the free flow of communication between the health care provider and patient, **negatively impacting health outcomes and** preventing clear and accurate communication and the development of empathy, confidence and mutual trust that is essential for an effective relationship between health care provider and patient.

(3) It is the policy of the Legislative Assembly to require [the use of] **working with** certified health care interpreters or qualified health care interpreters [whenever possible] to ensure the accurate and adequate provision of health care to persons with limited English proficiency and to persons who communicate in [sign] **signed** language.

(4) It is the policy of the Legislative Assembly that health care for persons with limited English proficiency be provided according to the guidelines established under the policy statement issued August 30, 2000, by the U.S. Department of Health and Human Services, Office for Civil Rights, entitled, "Title VI of the Civil Rights Act of 1964; Policy Guidance on the Prohibition Against National Origin Discrimination As It Affects Persons With Limited English Proficiency," and the 1978 Patient's Bill of Rights.

SECTION 10. ORS 413.556 is amended to read:

413.556. The Oregon Council on Health Care Interpreters shall work in cooperation with the Oregon Health Authority to:

(1) Develop **and approve** testing, qualification and certification standards, **consistent with national standards**, for health care interpreters for persons with limited English proficiency and for persons who communicate in [sign] **signed** language.

[2] *Coordinate with other states, the federal government or professional organizations to develop and implement educational and testing programs for health care interpreters.*

[3] *Examine operational and funding issues, including but not limited to the feasibility of developing a central registry and annual subscription mechanism for health care interpreters.*

[4] (2) Do all other acts as shall be necessary or appropriate under the provisions of ORS 413.550 to 413.558.

SECTION 11. ORS 413.558 is amended to read:

413.558. (1) In consultation with the Oregon Council on Health Care Interpreters, the Oregon Health Authority shall by rule establish procedures for testing, qualification and certification of health care interpreters for persons with limited English proficiency or for persons who communicate in [sign] **signed** language, including but not limited to:

(a) Minimum standards for qualification and certification as a health care interpreter, **which may be modified as necessary**, including:

(A) Oral [*and written*] **or signed** language skills in English and in the language for which health care interpreter qualification or certification is granted; and

(B) Formal education or training in **interpretation**, medical **behavioral or oral health** terminology, anatomy and physiology[, *medical interpreting ethics and interpreting skills*];

(b) Categories of expertise of health care interpreters based on the English and non-English skills, or interpreting skills, and the medical terminology skills of the person seeking qualification or certification;

(c) Procedures for receiving applications and for examining applicants for qualification or certification;

(d) The content and administration of required examinations;

(e) The requirements and procedures for reciprocity of qualification and certification for health care interpreters qualified or certified in another state or territory of the United States or by another certifying body in the United States; and

(f) Fees for application, examination, initial issuance, renewal and reciprocal acceptance of qualification or certification as a health care interpreter if deemed necessary by the authority.

(2) Any person seeking qualification or certification as a health care interpreter must submit an application to the authority. If the applicant meets the requirements for qualification or certification established by the authority under this section, the authority shall issue a letter of qualification or a certification to the health care interpreter. **The authority shall notify a person of the authority's determination on the person's application no later than 60 days after the date the application is received by the authority.**

(3) The authority shall work with other states, the federal government or professional organizations to develop educational and testing programs and procedures for the qualification and certification of health care interpreters.

(4) In addition to the requirements for qualification established under subsection (1) of this section, a person may be qualified as a health care interpreter only if the person:

(a) Is able to fluently interpret [*the dialect*,] slang, **idioms and specialized vocabulary in English and the slang, idioms** or specialized vocabulary of the non-English language for which qualification is sought; and

(b) Has had at least 60 hours of health care interpreter training that includes anatomy and physiology and concepts of [*medical*] **health care** interpretation.

(5) A person may not use the title of "qualified health care interpreter" in this state, **or any other title, designation, words, letters, abbreviation, sign or device tending to indicate that the person is a qualified health care interpreter**, unless the person has met the requirements for qualification established under subsections (1) and (4) of this section and has been issued a valid letter of qualification by the authority.

(6) In addition to the requirements for certification established under subsection (1) of this section, a person may be certified as a health care interpreter only if:

(a) The person has met all the requirements established under subsection (4) of this section; and

(b) The person has passed written and oral examinations required by the authority in English, in a non-English language or [*sign*] **signed** language and in medical terminology.

(7) A person may not use the title of "certified health care interpreter" in this state, **or any other title, designation, words, letters, abbreviation, sign or device tending to indicate that the person is a certified health care interpreter**, unless the person has met the requirements for certification established under subsections (1) and (6) of this section and has been issued a valid certification by the authority.

(8) The authority shall:

(a) **Provide health care interpreter training and continuing education in accordance with standards adopted by the Oregon Council on Health Care Interpreters under ORS 413.556 to professionalize the health care interpreter workforce in this state. The training may be provided at no cost or, if not, must be affordable.**

(b) **Maintain a record of all health care interpreters who have completed an approved training program.**

(c) **Establish and maintain a central registry for all health care interpreters who are qualified or certified by the authority and establish a process for health care interpreters to biennially update their contact information and confirm their participation in the registry.**

(d) **Adopt rules to carry out the provisions of this section.**

(9) **The authority shall provide the notice described in ORS 183.335 (1) to all certified and qualified health care interpreters listed on the registry prior to the adoption, amendment or repeal of any rule concerning qualified or certified health care interpreter services.**

SECTION 12. The amendments to ORS 413.558 by section 11 of this 2021 Act do not require the Oregon Health Authority or the Oregon Council on Health Care Interpreters to

establish a new health care interpreter registry in addition to the health care interpreter registry in effect on the effective date of this 2021 Act.

SECTION 13. ORS 414.572 is amended to read:

414.572. (1) The Oregon Health Authority shall adopt by rule the qualification criteria and requirements for a coordinated care organization and shall integrate the criteria and requirements into each contract with a coordinated care organization. Coordinated care organizations may be local, community-based organizations or statewide organizations with community-based participation in governance or any combination of the two. Coordinated care organizations may contract with counties or with other public or private entities to provide services to members. The authority may not contract with only one statewide organization. A coordinated care organization may be a single corporate structure or a network of providers organized through contractual relationships. The criteria and requirements adopted by the authority under this section must include, but are not limited to, a requirement that the coordinated care organization:

(a) Have demonstrated experience and a capacity for managing financial risk and establishing financial reserves.

(b) Meet the following minimum financial requirements:

(A) Maintain restricted reserves of \$250,000 plus an amount equal to 50 percent of the coordinated care organization's total actual or projected liabilities above \$250,000.

(B) Maintain capital or surplus of not less than \$2,500,000 and any additional amounts necessary to ensure the solvency of the coordinated care organization, as specified by the authority by rules that are consistent with ORS 731.554 (6), 732.225, 732.230 and 750.045.

(C) Expend a portion of the annual net income or reserves of the coordinated care organization that exceed the financial requirements specified in this paragraph on services designed to address health disparities and the social determinants of health consistent with the coordinated care organization's community health improvement plan and transformation plan and the terms and conditions of the Medicaid demonstration project under section 1115 of the Social Security Act (42 U.S.C. 1315).

(c) Operate within a fixed global budget and, by January 1, 2023, spend on primary care, as defined in section 2, chapter 575, Oregon Laws 2015, at least 12 percent of the coordinated care organization's total expenditures for physical and mental health care provided to members, except for expenditures on prescription drugs, vision care and dental care.

(d) Develop and implement alternative payment methodologies that are based on health care quality and improved health outcomes.

(e) Coordinate the delivery of physical health care, [*mental health and chemical dependency services*] **behavioral health care**, oral health care and covered long-term care services.

(f) Engage community members and health care providers in improving the health of the community and addressing regional, cultural, socioeconomic and racial disparities in health care that exist among the coordinated care organization's members and in the coordinated care organization's community.

(2) In addition to the criteria and requirements specified in subsection (1) of this section, the authority must adopt by rule requirements for coordinated care organizations contracting with the authority so that:

(a) Each member of the coordinated care organization receives integrated person centered care and services designed to provide choice, independence and dignity.

(b) Each member has a consistent and stable relationship with a care team that is responsible for comprehensive care management and service delivery.

(c) The supportive and therapeutic needs of each member are addressed in a holistic fashion, using patient centered primary care homes, behavioral health homes or other models that support patient centered primary care and behavioral health care and individualized care plans to the extent feasible.

(d) Members receive comprehensive transitional care, including appropriate follow-up, when entering and leaving an acute care facility or a long term care setting.

(e) Members *[receive]* **are provided:**

(A) Assistance in navigating the health care delivery system;

(B) **Assistance** *[and]* in accessing community and social support services and statewide resources[, *including through the use of certified health care interpreters and qualified health care interpreters, as those terms are defined in ORS 413.550*];

(C) **Meaningful language access as required by federal and state law including, but not limited to, 42 U.S.C. 18116, Title VI of the Civil Rights Act of 1964, Title VI Guidance issued by the United States Department of Justice and the National Standards for Culturally and Linguistically Appropriate Services in Health and Health Care as issued by the United States Department of Health and Human Services; and**

(D) **Qualified health care interpreters or certified health care interpreters listed on the health care interpreter registry, as those terms are defined in ORS 413.550.**

(f) Services and supports are geographically located as close to where members reside as possible and are, if available, offered in nontraditional settings that are accessible to families, diverse communities and underserved populations.

(g) Each coordinated care organization uses health information technology to link services and care providers across the continuum of care to the greatest extent practicable and if financially viable.

(h) Each coordinated care organization complies with the safeguards for members described in ORS 414.605.

(i) Each coordinated care organization convenes a community advisory council that meets the criteria specified in ORS 414.575.

(j) Each coordinated care organization prioritizes working with members who have high health care needs, multiple chronic conditions[, *mental illness or chemical dependency*] **or behavioral health conditions** and involves those members in accessing and managing appropriate preventive, health, remedial and supportive care and services, including the services described in ORS 414.766, to reduce the use of avoidable emergency room visits and hospital admissions.

(k) Members have a choice of providers within the coordinated care organization's network and that providers participating in a coordinated care organization:

(A) Work together to develop best practices for care and service delivery to reduce waste and improve the health and well-being of members.

(B) Are educated about the integrated approach and how to access and communicate within the integrated system about a patient's treatment plan and health history.

(C) Emphasize prevention, healthy lifestyle choices, evidence-based practices, shared decision-making and communication.

(D) Are permitted to participate in the networks of multiple coordinated care organizations.

(E) Include providers of specialty care.

(F) Are selected by coordinated care organizations using universal application and credentialing procedures and objective quality information and are removed if the providers fail to meet objective quality standards.

(G) Work together to develop best practices for culturally **and linguistically** appropriate care and service delivery to reduce waste, reduce health disparities and improve the health and well-being of members.

(L) Each coordinated care organization reports on outcome and quality measures adopted under ORS 414.638 and participates in the health care data reporting system established in ORS 442.372 and 442.373.

(m) Each coordinated care organization uses best practices in the management of finances, contracts, claims processing, payment functions and provider networks.

(n) Each coordinated care organization participates in the learning collaborative described in ORS 413.259 (3).

(o) Each coordinated care organization has a governing body that complies with ORS 414.584 and that includes:

(A) At least one member representing persons that share in the financial risk of the organization;

(B) A representative of a dental care organization selected by the coordinated care organization;

(C) The major components of the health care delivery system;

(D) At least two health care providers in active practice, including:

(i) A physician licensed under ORS chapter 677 or a nurse practitioner licensed under ORS 678.375, whose area of practice is primary care; and

(ii) A [mental health or chemical dependency treatment] **behavioral health** provider;

(E) At least two members from the community at large, to ensure that the organization's decision-making is consistent with the values of the members and the community; and

(F) At least two members of the community advisory council, one of whom is or was within the previous six months a recipient of medical assistance and is at least 16 years of age, or a parent, guardian or primary caregiver of an individual who is or was within the previous six months a recipient of medical assistance.

(p) Each coordinated care organization's governing body establishes standards for publicizing the activities of the coordinated care organization and the organization's community advisory councils, as necessary, to keep the community informed.

(q) Each coordinated care organization publishes on a website maintained by or on behalf of the coordinated care organization, in a manner determined by the authority, a document designed to educate members about best practices, care quality expectations, screening practices, treatment options and other support resources available for members who have mental illnesses or substance use disorders.

(r) Each coordinated care organization works with the Tribal Advisory Council established in ORS 414.581 and has a dedicated tribal liaison, selected by the council, to:

(A) Facilitate a resolution of any issues that arise between the coordinated care organization and a provider of Indian health services within the area served by the coordinated care organization;

(B) Participate in the community health assessment and the development of the health improvement plan;

(C) Communicate regularly with the Tribal Advisory Council; and

(D) Be available for training by the office within the authority that is responsible for tribal affairs, any federally recognized tribe in Oregon and the urban Indian health program that is located within the area served by the coordinated care organization and operated by an urban Indian organization pursuant to 25 U.S.C. 1651.

(3) The authority shall consider the participation of area agencies and other nonprofit agencies in the configuration of coordinated care organizations.

(4) In selecting one or more coordinated care organizations to serve a geographic area, the authority shall:

(a) For members and potential members, optimize access to care and choice of providers;

(b) For providers, optimize choice in contracting with coordinated care organizations; and

(c) Allow more than one coordinated care organization to serve the geographic area if necessary to optimize access and choice under this subsection.

(5) On or before July 1, 2014, each coordinated care organization must have a formal contractual relationship with any dental care organization that serves members of the coordinated care organization in the area where they reside.

SECTION 14. ORS 414.572, as amended by section 14, chapter 489, Oregon Laws 2017, section 4, chapter 49, Oregon Laws 2018, section 8, chapter 358, Oregon Laws 2019, section 2, chapter 364, Oregon Laws 2019, section 58, chapter 478, Oregon Laws 2019, and section 7, chapter 529, Oregon Laws 2019, is amended to read:

414.572. (1) The Oregon Health Authority shall adopt by rule the qualification criteria and requirements for a coordinated care organization and shall integrate the criteria and requirements into each contract with a coordinated care organization. Coordinated care organizations may be

local, community-based organizations or statewide organizations with community-based participation in governance or any combination of the two. Coordinated care organizations may contract with counties or with other public or private entities to provide services to members. The authority may not contract with only one statewide organization. A coordinated care organization may be a single corporate structure or a network of providers organized through contractual relationships. The criteria and requirements adopted by the authority under this section must include, but are not limited to, a requirement that the coordinated care organization:

(a) Have demonstrated experience and a capacity for managing financial risk and establishing financial reserves.

(b) Meet the following minimum financial requirements:

(A) Maintain restricted reserves of \$250,000 plus an amount equal to 50 percent of the coordinated care organization's total actual or projected liabilities above \$250,000.

(B) Maintain capital or surplus of not less than \$2,500,000 and any additional amounts necessary to ensure the solvency of the coordinated care organization, as specified by the authority by rules that are consistent with ORS 731.554 (6), 732.225, 732.230 and 750.045.

(C) Expend a portion of the annual net income or reserves of the coordinated care organization that exceed the financial requirements specified in this paragraph on services designed to address health disparities and the social determinants of health consistent with the coordinated care organization's community health improvement plan and transformation plan and the terms and conditions of the Medicaid demonstration project under section 1115 of the Social Security Act (42 U.S.C. 1315).

(c) Operate within a fixed global budget and spend on primary care, as defined by the authority by rule, at least 12 percent of the coordinated care organization's total expenditures for physical and mental health care provided to members, except for expenditures on prescription drugs, vision care and dental care.

(d) Develop and implement alternative payment methodologies that are based on health care quality and improved health outcomes.

(e) Coordinate the delivery of physical health care, [*mental health and chemical dependency services*] **behavioral health care**, oral health care and covered long-term care services.

(f) Engage community members and health care providers in improving the health of the community and addressing regional, cultural, socioeconomic and racial disparities in health care that exist among the coordinated care organization's members and in the coordinated care organization's community.

(2) In addition to the criteria and requirements specified in subsection (1) of this section, the authority must adopt by rule requirements for coordinated care organizations contracting with the authority so that:

(a) Each member of the coordinated care organization receives integrated person centered care and services designed to provide choice, independence and dignity.

(b) Each member has a consistent and stable relationship with a care team that is responsible for comprehensive care management and service delivery.

(c) The supportive and therapeutic needs of each member are addressed in a holistic fashion, using patient centered primary care homes, behavioral health homes or other models that support patient centered primary care and behavioral health care and individualized care plans to the extent feasible.

(d) Members receive comprehensive transitional care, including appropriate follow-up, when entering and leaving an acute care facility or a long term care setting.

(e) Members [*receive*] **are provided**:

(A) Assistance in navigating the health care delivery system;

(B) **Assistance** [*and*] in accessing community and social support services and statewide resources[, *including through the use of certified health care interpreters and qualified health care interpreters, as those terms are defined in ORS 413.550*];

(C) **Meaningful language access as required by federal and state law including, but not limited to, 42 U.S.C. 18116, Title VI of the Civil Rights Act of 1964, Title VI Guidance issued by the United States Department of Justice and the National Standards for Culturally and Linguistically Appropriate Services in Health and Health Care as issued by the United States Department of Health and Human Services; and**

(D) **Qualified health care interpreters or certified health care interpreters listed on the health care interpreter registry, as those terms are defined in ORS 413.550.**

(f) Services and supports are geographically located as close to where members reside as possible and are, if available, offered in nontraditional settings that are accessible to families, diverse communities and underserved populations.

(g) Each coordinated care organization uses health information technology to link services and care providers across the continuum of care to the greatest extent practicable and if financially viable.

(h) Each coordinated care organization complies with the safeguards for members described in ORS 414.605.

(i) Each coordinated care organization convenes a community advisory council that meets the criteria specified in ORS 414.575.

(j) Each coordinated care organization prioritizes working with members who have high health care needs, multiple chronic conditions[, *mental illness or chemical dependency*] **or behavioral health conditions** and involves those members in accessing and managing appropriate preventive, health, remedial and supportive care and services, including the services described in ORS 414.766, to reduce the use of avoidable emergency room visits and hospital admissions.

(k) Members have a choice of providers within the coordinated care organization's network and that providers participating in a coordinated care organization:

(A) Work together to develop best practices for care and service delivery to reduce waste and improve the health and well-being of members.

(B) Are educated about the integrated approach and how to access and communicate within the integrated system about a patient's treatment plan and health history.

(C) Emphasize prevention, healthy lifestyle choices, evidence-based practices, shared decision-making and communication.

(D) Are permitted to participate in the networks of multiple coordinated care organizations.

(E) Include providers of specialty care.

(F) Are selected by coordinated care organizations using universal application and credentialing procedures and objective quality information and are removed if the providers fail to meet objective quality standards.

(G) Work together to develop best practices for culturally **and linguistically** appropriate care and service delivery to reduce waste, reduce health disparities and improve the health and well-being of members.

(L) Each coordinated care organization reports on outcome and quality measures adopted under ORS 414.638 and participates in the health care data reporting system established in ORS 442.372 and 442.373.

(m) Each coordinated care organization uses best practices in the management of finances, contracts, claims processing, payment functions and provider networks.

(n) Each coordinated care organization participates in the learning collaborative described in ORS 413.259 (3).

(o) Each coordinated care organization has a governing body that complies with ORS 414.584 and that includes:

(A) At least one member representing persons that share in the financial risk of the organization;

(B) A representative of a dental care organization selected by the coordinated care organization;

(C) The major components of the health care delivery system;

(D) At least two health care providers in active practice, including:

(i) A physician licensed under ORS chapter 677 or a nurse practitioner licensed under ORS 678.375, whose area of practice is primary care; and

(ii) A *[mental health or chemical dependency treatment]* **behavioral health** provider;

(E) At least two members from the community at large, to ensure that the organization's decision-making is consistent with the values of the members and the community; and

(F) At least two members of the community advisory council, one of whom is or was within the previous six months a recipient of medical assistance and is at least 16 years of age or a parent, guardian or primary caregiver of an individual who is or was within the previous six months a recipient of medical assistance.

(p) Each coordinated care organization's governing body establishes standards for publicizing the activities of the coordinated care organization and the organization's community advisory councils, as necessary, to keep the community informed.

(q) Each coordinated care organization publishes on a website maintained by or on behalf of the coordinated care organization, in a manner determined by the authority, a document designed to educate members about best practices, care quality expectations, screening practices, treatment options and other support resources available for members who have mental illnesses or substance use disorders.

(r) Each coordinated care organization works with the Tribal Advisory Council established in ORS 414.581 and has a dedicated tribal liaison, selected by the council, to:

(A) Facilitate a resolution of any issues that arise between the coordinated care organization and a provider of Indian health services within the area served by the coordinated care organization;

(B) Participate in the community health assessment and the development of the health improvement plan;

(C) Communicate regularly with the Tribal Advisory Council; and

(D) Be available for training by the office within the authority that is responsible for tribal affairs, any federally recognized tribe in Oregon and the urban Indian health program that is located within the area served by the coordinated care organization and operated by an urban Indian organization pursuant to 25 U.S.C. 1651.

(3) The authority shall consider the participation of area agencies and other nonprofit agencies in the configuration of coordinated care organizations.

(4) In selecting one or more coordinated care organizations to serve a geographic area, the authority shall:

(a) For members and potential members, optimize access to care and choice of providers;

(b) For providers, optimize choice in contracting with coordinated care organizations; and

(c) Allow more than one coordinated care organization to serve the geographic area if necessary to optimize access and choice under this subsection.

(5) On or before July 1, 2014, each coordinated care organization must have a formal contractual relationship with any dental care organization that serves members of the coordinated care organization in the area where they reside.

SECTION 15. ORS 656.027 is amended to read:

656.027. All workers are subject to this chapter except those nonsubject workers described in the following subsections:

(1) A worker employed as a domestic servant in or about a private home. For the purposes of this subsection "domestic servant" means any worker engaged in household domestic service by private employment contract, including, but not limited to, home health workers.

(2) A worker employed to do gardening, maintenance, repair, remodeling or similar work in or about the private home of the person employing the worker.

(3)(a) A worker whose employment is casual and either:

(A) The employment is not in the course of the trade, business or profession of the employer;
or

(B) The employment is in the course of the trade, business or profession of a nonsubject employer.

(b) For the purpose of this subsection, “casual” refers only to employments where the work in any 30-day period, without regard to the number of workers employed, involves a total labor cost of less than \$500.

(4) A person for whom a rule of liability for injury or death arising out of and in the course of employment is provided by the laws of the United States.

(5) A worker engaged in the transportation in interstate commerce of goods, persons or property for hire by rail, water, aircraft or motor vehicle, and whose employer has no fixed place of business in this state.

(6) Firefighter and police employees of any city having a population of more than 200,000 that provides a disability and retirement system by ordinance or charter.

(7)(a) Sole proprietors, except those described in paragraph (b) of this subsection. When labor or services are performed under contract, the sole proprietor must qualify as an independent contractor **to be a nonsubject worker**.

(b) Sole proprietors actively licensed under ORS 671.525 or 701.021. When labor or services are performed under contract for remuneration, notwithstanding ORS 656.005 (30), the sole proprietor must qualify as an independent contractor. Any sole proprietor licensed under ORS 671.525 or 701.021 and involved in activities subject thereto is conclusively presumed to be an independent contractor.

(8) Except as provided in subsection (23) of this section, partners who are not engaged in work performed in direct connection with the construction, alteration, repair, improvement, moving or demolition of an improvement on real property or appurtenances thereto. When labor or services are performed under contract, the partnership must qualify as an independent contractor **to be a nonsubject worker**.

(9) Except as provided in subsection (25) of this section, members, including members who are managers, of limited liability companies, regardless of the nature of the work performed. However, members, including members who are managers, of limited liability companies with more than one member, while engaged in work performed in direct connection with the construction, alteration, repair, improvement, moving or demolition of an improvement on real property or appurtenances thereto, are subject workers. When labor or services are performed under contract, the limited liability company must qualify as an independent contractor **to be a nonsubject worker**.

(10) Except as provided in subsection (24) of this section, corporate officers who are directors of the corporation and who have a substantial ownership interest in the corporation, regardless of the nature of the work performed by such officers, subject to the following limitations:

(a) If the activities of the corporation are conducted on land that receives farm use tax assessment pursuant to ORS chapter 308A, corporate officer includes all individuals identified as directors in the corporate bylaws, regardless of ownership interest, and who are members of the same family, whether related by blood, marriage or adoption.

(b) If the activities of the corporation involve the commercial harvest of timber and all officers of the corporation are members of the same family and are parents, daughters or sons, daughters-in-law or sons-in-law or grandchildren, then all such officers may elect to be nonsubject workers. For all other corporations involving the commercial harvest of timber, the maximum number of exempt corporate officers for the corporation shall be whichever is the greater of the following:

(A) Two corporate officers; or

(B) One corporate officer for each 10 corporate employees.

(c) When labor or services are performed under contract, the corporation must qualify as an independent contractor **to be a nonsubject worker**.

(11) A person performing services primarily for board and lodging received from any religious, charitable or relief organization.

(12) A newspaper carrier utilized in compliance with the provisions of ORS 656.070 and 656.075.

(13) A person who has been declared an amateur athlete under the rules of the United States Olympic Committee or the Canadian Olympic Committee and who receives no remuneration for performance of services as an athlete other than board, room, rent, housing, lodging or other reasonable incidental subsistence allowance, or any amateur sports official who is certified by a recognized Oregon or national certifying authority, which requires or provides liability and accident insurance for such officials. A roster of recognized Oregon and national certifying authorities will be maintained by the Department of Consumer and Business Services, from lists of certifying organizations submitted by the Oregon School Activities Association and the Oregon Park and Recreation Society.

(14) Volunteer personnel participating in the ACTION programs, organized under the Domestic Volunteer Service Act of 1973, P.L. 93-113, known as the Foster Grandparent Program and the Senior Companion Program, whether or not the volunteers receive a stipend or nominal reimbursement for time and travel expenses.

(15) A person who has an ownership or leasehold interest in equipment and who furnishes, maintains and operates the equipment. As used in this subsection "equipment" means:

(a) A motor vehicle used in the transportation of logs, poles or piling.

(b) A motor vehicle used in the transportation of rocks, gravel, sand, dirt or asphalt concrete.

(c) A motor vehicle used in the transportation of property by a for-hire motor carrier that is required under ORS 825.100 or 825.104 to possess a certificate or permit or to be registered.

(16) A person engaged in the transportation of the public for recreational down-river boating activities on the waters of this state pursuant to a federal permit when the person furnishes the equipment necessary for the activity. As used in this subsection, "recreational down-river boating activities" means those boating activities for the purpose of recreational fishing, swimming or sightseeing utilizing a float craft with oars or paddles as the primary source of power.

(17) A person who receives no wage other than ski passes or other noncash remuneration for performing volunteer:

(a) Ski patrol activities; or

(b) Ski area program activities sponsored by a ski area operator, as defined in ORS 30.970, or by a nonprofit corporation or organization.

(18) A person 19 years of age or older who contracts with a newspaper publishing company or independent newspaper dealer or contractor to distribute newspapers to the general public and perform or undertake any necessary or attendant functions related thereto.

(19) A person performing foster parent or adult foster care duties pursuant to [ORS 412.001 to 412.161 and 412.991 or] ORS chapter [411,] 418, 430 or 443.

(20) A person performing services on a volunteer basis for a nonprofit, religious, charitable or relief organization, whether or not such person receives meals or lodging or nominal reimbursements or vouchers for meals, lodging or expenses.

(21) A person performing services under a property tax work-off program established under ORS 310.800.

(22) A person who performs service as a caddy at a golf course in an established program for the training and supervision of caddies under the direction of a person who is an employee of the golf course.

(23)(a) Partners who are actively licensed under ORS 671.525 or 701.021 and who have a substantial ownership interest in a partnership. If all partners are members of the same family and are parents, spouses, sisters, brothers, daughters or sons, daughters-in-law or sons-in-law or grandchildren, all such partners may elect to be nonsubject workers. For all other partnerships licensed under ORS 671.510 to 671.760 or 701.021, the maximum number of exempt partners shall be whichever is the greater of the following:

(A) Two partners; or

(B) One partner for each 10 partnership employees.

(b) When labor or services are performed under contract for remuneration, notwithstanding ORS 656.005 (30), the partnership qualifies as an independent contractor. Any partnership licensed under

ORS 671.525 or 701.021 and involved in activities subject thereto is conclusively presumed to be an independent contractor.

(24)(a) Corporate officers who are directors of a corporation actively licensed under ORS 671.525 or 701.021 and who have a substantial ownership interest in the corporation, regardless of the nature of the work performed. If all officers of the corporation are members of the same family and are parents, spouses, sisters, brothers, daughters or sons, daughters-in-law or sons-in-law or grandchildren, all such officers may elect to be nonsubject workers. For all other corporations licensed under ORS 671.510 to 671.760 or 701.021, the maximum number of exempt corporate officers shall be whichever is the greater of the following:

(A) Two corporate officers; or

(B) One corporate officer for each 10 corporate employees.

(b) When labor or services are performed under contract for remuneration, notwithstanding ORS 656.005 (30), the corporation qualifies as an independent contractor. Any corporation licensed under ORS 671.525 or 701.021 and involved in activities subject thereto is conclusively presumed to be an independent contractor.

(25)(a) Limited liability company members who are members of a company actively licensed under ORS 671.525 or 701.021 and who have a substantial ownership interest in the company, regardless of the nature of the work performed. If all members of the company are members of the same family and are parents, spouses, sisters, brothers, daughters or sons, daughters-in-law or sons-in-law or grandchildren, all such members may elect to be nonsubject workers. For all other companies licensed under ORS 671.510 to 671.760 or 701.021, the maximum number of exempt company members shall be whichever is the greater of the following:

(A) Two company members; or

(B) One company member for each 10 company employees.

(b) When labor or services are performed under contract for remuneration, notwithstanding ORS 656.005 (30), the company qualifies as an independent contractor. Any company licensed under ORS 671.525 or 701.021 and involved in activities subject thereto is conclusively presumed to be an independent contractor.

(26) A person serving as a referee or assistant referee in a youth or adult recreational soccer match whose services are retained on a match-by-match basis.

[*(27) A person performing language translator or interpreter services that are provided for others through an agent or broker.*]

[*(28)*] **(27)** A person who operates, and who has an ownership or leasehold interest in, a passenger motor vehicle that is operated as a taxicab or for nonemergency medical transportation. As used in this subsection:

(a) "Lease" means a contract under which the lessor provides a vehicle to a lessee for consideration.

(b) "Leasehold" includes, but is not limited to, a lease for a shift or a longer period.

(c) "Passenger motor vehicle that is operated as a taxicab" means a vehicle that:

(A) Has a passenger seating capacity that does not exceed seven persons;

(B) Is transporting persons, property or both on a route that begins or ends in Oregon; and

(C)(i) Carries passengers for hire when the destination and route traveled may be controlled by a passenger and the fare is calculated on the basis of any combination of an initial fee, distance traveled or waiting time; or

(ii) Is in use under a contract to provide specific service to a third party to transport designated passengers or to provide errand services to locations selected by the third party.

(d) "Passenger motor vehicle that is operated for nonemergency medical transportation" means a vehicle that:

(A) Has a passenger seating capacity that does not exceed seven persons;

(B) Is transporting persons, property or both on a route that begins or ends in Oregon; and

(C) Provides medical transportation services under contract with or on behalf of a mass transit or transportation district.

SECTION 16. ORS 657.046 is amended to read:

657.046. (1) As used in this chapter, "employment" does not include service performed in the operation of a passenger motor vehicle that is operated as a taxicab or a passenger motor vehicle that is operated for nonemergency medical transportation, by a person who has an ownership or leasehold interest in the passenger motor vehicle, for an entity that is operated by a board of owner-operators elected by the members of the entity.

(2) As used in this section:

(a) "Leasehold" has the meaning given that term in ORS 656.027 [(28)] **(27)**.

(b) "Passenger motor vehicle that is operated as a taxicab" means a vehicle that:

(A) Has a passenger seating capacity of at least three persons and not more than seven persons;

(B) On a route that begins or ends in Oregon, is used primarily to transport persons;

(C)(i) Carries passengers for hire when the destination and route traveled may be controlled by a passenger and the fare is calculated on the basis of any combination of an initial fee, distance traveled or waiting time; or

(ii) Is in use under a contract to provide specific service to a third party to transport designated passengers to locations selected by the third party; and

(D) Is not used more than secondarily or incidentally for errand services or to transport property, instead of or in addition to transporting passengers.

(c) "Passenger motor vehicle that is operated for nonemergency medical transportation" means a vehicle that:

(A) Has a passenger seating capacity of at least three persons and not more than seven persons;

(B) On a route that begins or ends in Oregon, is used primarily to transport persons;

(C) Provides medical transportation services under contract with or on behalf of a mass transit or transportation district; and

(D) Is not used more than secondarily or incidentally for errand services or to transport property, instead of or in addition to transporting passengers.

(3) The provisions of this section do not apply to service performed for:

(a) A nonprofit employing unit;

(b) This state;

(c) A political subdivision of this state; or

(d) An Indian tribe.

SECTION 17. ORS 657.048 is repealed.

SECTION 18. (1) Section 4 of this 2021 Act and the amendments to ORS 413.550, 413.552 and 413.556 by sections 8 to 10 of this 2021 Act become operative on September 1, 2022.

(2) Sections 2, 3 and 6 of this 2021 Act and the amendments to ORS 414.572 by section 13 of this 2021 Act become operative on July 1, 2022.

SECTION 19. Notwithstanding any other provision of law, the General Fund appropriation made to the Oregon Health Authority by section 1 (3), chapter _____, Oregon Laws 2021 (Enrolled House Bill 5024), for the biennium beginning July 1, 2021, for central services, state assessments and enterprise-wide costs, is increased by \$670,664 for carrying out the provisions of this 2021 Act.

SECTION 20. Notwithstanding any other law limiting expenditures, the limitation on expenditures established by section 2 (3), chapter _____, Oregon Laws 2021 (Enrolled House Bill 5024), for the biennium beginning July 1, 2021, as the maximum limit for payment of expenses from fees, moneys or other revenues, including Miscellaneous Receipts, tobacco tax receipts, marijuana tax receipts, beer and wine tax receipts, provider taxes and Medicare receipts, but excluding lottery funds and federal funds not described in section 2, chapter _____, Oregon Laws 2021 (Enrolled House Bill 5024), collected or received by the Oregon Health Authority, for central services, state assessments and enterprise-wide costs, is increased by \$66,812 for carrying out the provisions of this 2021 Act.

SECTION 21. Notwithstanding any other law limiting expenditures, the limitation on expenditures established by section 5 (3), chapter _____, Oregon Laws 2021 (Enrolled House

Bill 5024), for the biennium beginning July 1, 2021, as the maximum limit for payment of expenses from federal funds, excluding federal funds described in section 2, chapter _____, Oregon Laws 2021 (Enrolled House Bill 5024), collected or received by the Oregon Health Authority, for central services, state assessments and enterprise-wide costs, is increased by \$118,194 for the purpose of carrying out the provisions of this 2021 Act.

SECTION 22. This 2021 Act being necessary for the immediate preservation of the public peace, health and safety, an emergency is declared to exist, and this 2021 Act takes effect on its passage.

Passed by House June 17, 2021

.....
Timothy G. Sekerak, Chief Clerk of House

.....
Tina Kotek, Speaker of House

Passed by Senate June 22, 2021

.....
Peter Courtney, President of Senate

Received by Governor:

.....M.,....., 2021

Approved:

.....M.,....., 2021

.....
Kate Brown, Governor

Filed in Office of Secretary of State:

.....M.,....., 2021

.....
Shemia Fagan, Secretary of State

PURNELL Mackenzie G * BCE

From: PURNELL Mackenzie G * BCE
Sent: Wednesday, March 16, 2022 1:14 PM
To: PURNELL Mackenzie G * BCE
Subject: HB 2359 (2021) certified interpreter requirement
Attachments: Oregon Health Care Interpreter Program Requirements_.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

From: Lindley Lori [REDACTED] >
Sent: Tuesday, March 15, 2022 1:33 PM
To: MCLEOD-SKINNER Cass * BCE <Cass.MCLEOD-SKINNER@obce.oregon.gov>
Subject: RE: HB 2359 (2021) certified interpreter requirement

Cass;
You asked me to check if other health licensing boards are passing rules regarding the new state law that requires use of certified interpreters. I checked with my fellow AAG's and no one has begun that process at this time. I note in the bill that the health professional regulatory boards can enforce the requirement as well as OHA. I have not checked with OHA's AAG as to whether OHA will be implementing rules for enforcement or not.

From review of OHA's website, they have created a registry for practitioners to search for a registered interpreter as required under the new law ; see www.hciregistry.dhosh.state.or.us
They have also created an application process for interpreters to become certified; see www.Oregon.gov/oha/OEI/Pages/HCI-Certification.aspx
They have provided this FAQ sheet that I attach above as well.

In terms of whether or not OBCE should draft specific rules; that would be up to the Board. It may be just as effective to put the OHA interpreter information on the board's website and inform the practitioners that they are required to use qualified interpreters if they use them in their practices. In addition, the Board could do a FAQ with this information in a post card or e mail blast to the licensed practitioners.

Let me know if you need additional information on this topic.

Lori Lindley
Senior Assistant Attorney General
Business Activities Section
1162 Court St NE Salem OR 97301
(503) 947-4561
(971) 208-1184
(Mon- Fri 7:00 a.m. – 4:00 p.m.)

****ATTORNEY/CLIENT PRIVILEGED COMMUNICATION****
****ATTORNEY WORK PRODUCT PRIVILEGED****
****DO NOT DISTRIBUTE****

Oregon Health Care Interpreter Program Requirements

Oregon's Health Care Interpreter Program includes two levels of credentialing (qualification and certification). A qualified or certified health care interpreter must meet all of the requirements listed below and provide all of the supporting documentation.

	Qualification	Certification
Requirements and documentation	<ul style="list-style-type: none"> • Must be at least 18 years of age. <ul style="list-style-type: none"> <input type="checkbox"/> Copy of an Oregon driver's license or passport • Must not be on the Medicaid Exclusion List: http://exclusions.oig.hhs.gov/. <ul style="list-style-type: none"> <input type="checkbox"/> Printout of search results. • Must pass a background check. • Must have at least 60 hours of formal health care interpreter training. <ul style="list-style-type: none"> <input type="checkbox"/> Proof of successful completion of training at OHA-approved training center or equivalent • Must have language proficiency in English and the target language (see next page for more information). <ul style="list-style-type: none"> <input type="checkbox"/> Proof of passing a language proficiency test at an approved testing center <input type="checkbox"/> Or, demonstration of having met equivalent language proficiency requirements • Must have at least 15 hours of documented interpreting experience. • \$25 qualification fee payable (by check or money order) to OHA/OEI Health Care Interpreter Program (includes registration fee) • Send completed application and check to: Health Care Interpreter Program Office of Equity and Inclusion 421 SW Oak St. Suite 750 Portland, Oregon 97204 	<ul style="list-style-type: none"> • Must be at least 18 years of age. <ul style="list-style-type: none"> <input type="checkbox"/> Copy of an Oregon driver's license or passport • Must not be on the Medicaid Exclusion List: http://exclusions.oig.hhs.gov/. <ul style="list-style-type: none"> <input type="checkbox"/> Printout of search results. • Must pass a background check. • Must have at least 60 hours of formal health care interpreter training. <ul style="list-style-type: none"> <input type="checkbox"/> Proof of successful completion of training at OHA-approved training center or equivalent • Must have at least 30 hours of documented interpreting experience. <ul style="list-style-type: none"> <input type="checkbox"/> Proof of passing certification tests from one of the following: <ul style="list-style-type: none"> • National Board of Certification for Medical Interpreters • Certification Commission for Healthcare Interpreters • Oregon Court Interpreter Certification • Federal Court Interpreter Certification exams • American Sign Language (ASL) Certification • \$25 certification fee payable (by check or money order) to OHA/OEI Health Care Interpreter Program (includes registration fee) • Send completed application and check to: Health Care Interpreter Program Office of Equity and Inclusion 421 SW Oak St. Suite 750 Portland, Oregon 97204
Valid period	Four years	Four years

*Oral certification test is available in Spanish, Mandarin, Cantonese, Russian, Korean, Arabic and Vietnamese.

Questions? Contact the Oregon Health Care Interpreter Program: hci.program@dhs.ohs.state.or.us, 971-673-3328, www.oregon.gov/oha/oei, or call us to schedule an appointment in person.

Oregon Health Care Interpreter Program

Meeting the language proficiency requirements for HCI qualification and certification

Oregon Health Authority approved language proficiency testing centers include:

- [Language Line University](#) Level 2 or above ((Interagency Language Roundtable (ILR) equivalent, based on website information)).
- [Language Testing International](#) testing is based on American Council on the Teaching of Foreign Languages (ACTFL) assessment. Both the optional phone interpreter (OPI — telephonic) and OPIc (computer recording) are acceptable.
- The passing level for all language testing is advanced mid-level on the ACTFL scale.

Oral proficiency in both English and the non-English language (L2) may be demonstrated by passing any of the exams listed above (not expired) plus:

- Oregon Court Interpreter Registered status – not expired

One of the following may demonstrate oral proficiency in English:

- Bachelor, masters, doctorate or any other degree from any U.S. institution of higher education.
- Graduation from any high school in an English language speaking country where English is the primary language of instruction.
- Graduation from a higher education institution abroad where English is the primary language of instruction.
- One of the following tests (subject to change). Test results must be from no more than three years ago to be considered valid.
 - » Test of English as a Foreign Language (TOEFL): 570+ on paper; 230+ on computer version; 90+ on iBT
 - » Certificate in Advanced English (CAE), Level 4: B
 - » Certificate of Proficiency in English (CPE), Level 5: B
 - » International English Language Testing System (IELTS): 7.0+
 - » Interagency Language Roundtable (ILR): 2+
 - » Common European Framework (CEFR): B2
 - » Oral Proficiency Interview at the advanced mid-level on the ACTFL scale

One of the following may demonstrate oral proficiency in the non-English language:

- Bachelor, masters, doctorate or any other degree from an institution of higher education where instruction is primarily in the non-English language and the person submitting proof is a non-English language native speaker.
- Graduation from high school in a country where instruction is primarily in the non-English language and the person submitting proof is a native speaker of the non-English language.
- One of the following tests (subject to change). Test results must be from no more than three years ago to be considered valid:
 - » Interagency Language Round Table (ILR): 2+ from federal government testing agencies
 - » Common European Framework (CEFR): B2
 - » Oral Proficiency Interview at the advanced mid-level on the ACTFL scale



PERMANENT ADMINISTRATIVE ORDER

PH 48-2022

CHAPTER 333

OREGON HEALTH AUTHORITY

PUBLIC HEALTH DIVISION

FILED

04/27/2022 4:20 PM
ARCHIVES DIVISION
SECRETARY OF STATE
& LEGISLATIVE COUNSEL

FILING CAPTION: Updates Health Care Interpreter rules based on legislation and recommendations of the advisory council.

EFFECTIVE DATE: 07/01/2022

AGENCY APPROVED DATE: 04/27/2022

CONTACT: Edna Nyamu
503-381-0710
edna.nyamu@dhsosha.state.or.us

421 SW Oak St. Suite 750
Portland, OR 97204

Filed By:
Public Health Division
Rules Coordinator

RULES:

333-002-0000, 333-002-0010, 333-002-0030, 333-002-0035, 333-002-0040, 333-002-0050, 333-002-0060, 333-002-0070, 333-002-0120, 333-002-0140, 333-002-0150, 333-002-0170, 333-002-0190, 333-002-0230, 333-002-0250, 333-002-0270, 333-002-0290

AMEND: 333-002-0000

RULE TITLE: Purpose

NOTICE FILED DATE: 02/25/2022

RULE SUMMARY: Updates purpose to improve alignment with statutory intent and update to align with statutory changes.

RULE TEXT:

- (1) These rules establish the Health Care Interpreter (HCI) program, a central registry, and a process for certification and qualification of health care interpreters for persons with limited English proficiency, those who prefer to communicate in a language other than English, and Deaf and Hard of Hearing individuals whose primary communication is through American Sign Language or other signed languages. The rules set standards for health care providers and coordinated care organizations working with health care interpreters and interpreting service companies in Oregon.
- (2) These rules help the Oregon Health Authority comply with Title VI of the Civil Rights Act of 1964 which mandates that no person in the United States shall, on grounds of race, color or national origin, be excluded from participation in, denied the benefits of, or subjected to discrimination under any program or activity receiving federal financial assistance.
- (3) Nothing in these rules is meant to prevent an Emergency Medical Services provider from providing prehospital care as that term is defined in ORS 682.025 to an individual who has limited English proficiency, who communicates in signed language, or who prefers to communicate in a language other than English.
- (4) Nothing in these rules is meant to delay care in an emergency to an individual who has limited English proficiency, who communicates in signed language, or who prefers to communicate in a language other than English.

STATUTORY/OTHER AUTHORITY: ORS 413.558

STATUTES/OTHER IMPLEMENTED: ORS 413.556, 419.558

AMEND: 333-002-0010

RULE TITLE: Definitions

NOTICE FILED DATE: 02/25/2022

RULE SUMMARY: Updates definitions to better align with industry standards and statute.

RULE TEXT:

As used in chapter 333, division 2 the following definitions apply:

- (1) "Applicant" means any individual who applies for qualification or certification as a health care interpreter under OAR 333-002-0050.
- (2) "Authority" means the Oregon Health Authority.
- (3) "Central registry" means the record maintained by the Authority of enrolled individuals recognized as approved certified or qualified health care interpreters.
- (4) "Certified health care interpreter" means an individual who has been approved by the Oregon Health Authority and issued a valid letter of certification by the Authority under these rules to perform health care interpreting services as outlined under ORS 413.558.
- (5) "Coordinated Care Organization (CCO)" means a corporation, governmental agency, public corporation, or other legal entity that is certified as meeting the criteria adopted by the Authority under ORS 414.625 to be accountable for care management and to provide integrated and coordinated health care for each of the organization's members.
- (6) "Formal training" means instruction obtained in an academic setting, seminars, in-service instruction, or by other means of substantive learning.
- (7) "Health care" means medical, oral, vision, surgical or hospital care or any other remedial care recognized by state law, including physical and behavioral health care. For the purpose of these rules, "health care" does not currently include assistance with the activities of daily living or instrumental activities of daily living by providers. The Authority will monitor the exclusion of these services and make a determination on continuing this exception no later than July 1, 2025.
- (8) "Health care interpreter" means an individual who has proficiency in English and at least one other spoken or signed language and who is readily able to accurately:
 - (a) Communicate in English and communicate with a person who has limited English proficiency or who communicates in signed language. Under limited circumstances beginning September 1, 2022, the Authority may qualify an individual who has proficiency in a language of lesser diffusion and at least one other spoken or signed language other than English, as a health care interpreter;
 - (b) Interpret the oral statements of a person with limited English proficiency, or the statements of a person who communicates in signed language, into English or another language if relay interpreting;
 - (c) Interpret oral statements in English, or another language if relay interpreting, to a person with limited English proficiency or who communicates in signed language;
 - (d) Sight translate simple written documents for a person with limited English proficiency; and
 - (e) Effective September 1, 2022, provide interpretive services using relay or indirect interpretation.
- (9) "Health care interpreting services" means the provision of services to limited English proficient individuals through the process of fully understanding and analyzing a spoken or signed message, then faithfully rendering the message into another spoken or signed language in order to ensure access to any medical, surgical or hospital intervention including physical, oral, vision or behavioral health treatment.
- (10) "Health care provider" means any of the following that are reimbursed with public funds, in whole or in part:
 - (a) An individual licensed or certified by the:
 - (A) State Board of Examiners for Speech-Language Pathology and Audiology;
 - (B) State Board of Chiropractic Examiners;
 - (C) State Board of Licensed Social Workers;
 - (D) Oregon Board of Licensed Professional Counselors and Therapists;

- (E) Oregon Board of Dentistry;
- (F) State Board of Massage Therapists;
- (G) Oregon Board of Naturopathic Medicine;
- (H) Oregon State Board of Nursing;
- (I) Oregon Board of Optometry;
- (J) State Board of Pharmacy;
- (K) Oregon Medical Board;
- (L) Occupational Therapy Licensing Board;
- (M) Oregon Board of Physical Therapy;
- (N) Oregon Board of Psychology;
- (O) Board of Medical Imaging;
- (P) State Board of Direct Entry Midwifery;
- (Q) Respiratory Therapist and Polysomnographic Technologist Licensing Board;
- (R) Board of Registered Polysomnographic Technologists;
- (S) Board of Licensed Dietitians; and
- (T) State Mortuary and Cemetery Board;
- (b) An emergency medical services provider licensed by the Oregon Health Authority under ORS 682.216;
- (c) A clinical laboratory licensed under ORS 438.110;
- (d) A health care facility as defined in ORS 442.015;
- (e) A home health agency licensed under ORS 443.015;
- (f) A hospice program licensed under ORS 443.860; or
- (g) Any other person that provides health care, or that bills for or is compensated for providing health care, in the normal course of business.
- (11) "Integrated interpreting skills" means the ability to perform as required for employment, demonstrated by interpreting a simulated cross-linguistic interview with acceptable accuracy and completeness while monitoring and helping to manage the interaction in the interest of better communication and understanding.
- (12) "Interpreting service company" is used interchangeably with "Interpretation service company" from ORS 413.550 and means an entity, or a person acting on behalf of an entity, that is in the business of arranging for health care interpreters to work with health care providers in Oregon.
- (13) "Interpreting knowledge" means an entry-level range of knowledge, skills, and abilities that includes but is not limited to demonstrated capacity in:
 - (a) Language proficiency;
 - (b) Medical interpreting ethics;
 - (c) Cultural competency;
 - (d) Medical terminology;
 - (e) Integrated interpreting skills; and
 - (f) Sight translation of simple written instructions.
- (14) "Limited English proficiency" or "LEP" means a level of English proficiency that is insufficient to ensure equal access to public services without an interpreter.
- (15) "Person with limited English proficiency" means an individual who, by reason of place of birth or culture, communicates in a language other than English and does not communicate in English with adequate ability to communicate effectively to arrange for and receive health care or health related services or an individual who prefers to communicate in a language other than English.
- (16) "Qualified health care interpreter" means an individual who has been approved by the Authority and issued a valid letter of qualification by the Authority under these rules to perform health care interpreting services as outlined under ORS 413.558.
- (17) "Relay interpreting" is the practice of interpreting from one language to another through a third language. It is

necessary when no single interpreter commands the required language pair.

(18) "Sight translate" means to translate a simple written document into spoken or signed language.

(19) "Translation" means the process of creating a written or signed target text based on a source text, in such a way that the content and in many cases the form of the two texts, can be considered to be equivalent.

(20) "Written verification" means providing proof in a way that establishes the authenticity of submitted documents in a reasonably reliable manner and may include official transcripts, a certificate of completion, or an endorsement from an agency or institution whose training curriculum is approved by the Authority.

STATUTORY/OTHER AUTHORITY: ORS 413.558

STATUTES/OTHER IMPLEMENTED: ORS 413.556, 413.558

AMEND: 333-002-0030

RULE TITLE: Central Registry

NOTICE FILED DATE: 02/25/2022

RULE SUMMARY: Provides for return of provider, under certain circumstances, to the central registry after an individual has withdrawn.

RULE TEXT:

(1) The Authority shall maintain a central registry of individuals who are certified or qualified to provide health care interpreting services as provided in OAR 333-002-0020.

(2) The Oregon Health Authority shall maintain a list of languages for which health care interpreter certification or qualification is available.

(3) The Authority shall maintain and publish a list of Authority-approved training centers where applicants may receive the education required for certification or qualification.

(4) Certified or qualified health care interpreters may withdraw from the central registry by providing written notification to the Authority.

(5) If a certified or qualified health care interpreter has provided written notification of withdrawal but the qualification or certification has not yet expired, the certified or qualified health care interpreter who has requested to withdraw may be reinstated to the central registry by submitting a request for reinstatement to the Authority in writing.

STATUTORY/OTHER AUTHORITY: ORS 413.558

STATUTES/OTHER IMPLEMENTED: ORS 413.556, 413.558

REPEAL: 333-002-0035

RULE TITLE: Fees

NOTICE FILED DATE: 02/25/2022

RULE SUMMARY: Program fees retracted to decrease barriers to enrollment of interpreters and increase access to interpreters by clients.

RULE TEXT:

Applicants for enrollment or renewal shall submit a processing fee in the amount of \$25 with the required application or renewal materials.

STATUTORY/OTHER AUTHORITY: ORS 413.558

STATUTES/OTHER IMPLEMENTED: ORS 413.556, 413.558

AMEND: 333-002-0040

RULE TITLE: Eligibility Standards for Central Registry Enrollment, Qualification and Certification

NOTICE FILED DATE: 02/25/2022

RULE SUMMARY: Updates requirements for qualification and certification of healthcare interpreters, including removing background check requirements, to improve access to interpreters, support agency equity goals, and support alignment with national standards.

RULE TEXT:

(1) Individuals enrolled in the Health Care Interpreter (HCI) central registry shall:

(a) Be at least 18 years of age.

(b) Have at least a high school diploma from an accredited school in the United States of America, or pass the General Educational Development Test (GED), or have an equivalent education from another country.

(A) Individuals from other countries may apply to the Authority for an exception to this requirement when documentation to prove education is not available.

(B) Exceptions are at the sole discretion of the Authority.

(c) Not be on the Medicaid Exclusion list.

(d) Abide by a nationally recognized code of ethics and standards of practice such as the National Code of Ethics for Interpreters in Health Care, the National Standards of Practice for Interpreters in Health Care, and the Registry of Interpreters for the Deaf (RID) Code of Professional Conduct, as applicable.

(e) Submit the required forms and documentation to become a certified or qualified health care interpreter as defined by these rules.

(2) Applicants seeking to become a qualified health care interpreter for a spoken language or languages shall:

(a) Comply with the requirements set out in section (1) of this rule;

(b) Provide written verification of:

(A) At least 60 hours of formal training as defined in OAR 333-002-0060, with a certificate of completion dated no more than one year prior to the date of the written application to the HCI central registry; or

(B) At least 60 hours of formal training as defined in OAR 333-002-0060, with a certificate of completion dated more than one year prior to the date of the written HCI central registry application along with documentation that shows the applicant has been performing HCI work since completing. Documentation shall include a letter of proof, on letterhead from the supervisor or the client, if applicable; or

(C) Meeting the requirements outlined in section 3 of this rule.

(c) Demonstrate health care interpreting knowledge by passing a skill evaluation offered by an Authority-approved language proficiency testing center provided for in OAR 333-002-0070, or meet equivalent language proficiency requirements set by the Authority. Equivalent standards include having an organization or community that represents limited English proficiency members provide language proficiency testing for languages that do not have a test available.

(3) Educators and trainers of health care interpreters or ASL interpreters who have worked in the field for two consecutive years within the 4 years prior to the date of application may receive credit for 40 hours of the 60 hour requirement by providing valid documentation from an established registry or institution for time spent training health care interpreters. The remaining 20 hours shall meet Authority-approved requirements.

(4) Applicants seeking to become a qualified health care interpreter for American Sign Language shall:

(a) Comply with the requirements set out in section (1) of this rule;

(b) Provide written verification of certification in American Sign Language interpreting from the Registry of Interpreters for the Deaf (RID) or other Authority-approved signed language certification and testing bodies;

(5) Applicants seeking to become a certified health care interpreter in a spoken language or languages shall:

(a) Comply with the requirements set out in section (1) and (2) of this rule; and

(b) Pass an approved certification test at an interpreter certification testing center on the list provided for in OAR 333-

002-0070.

(6) Applicants seeking to become a certified health care interpreter in American Sign Language shall:

- (a) Comply with the requirements set out in section (1) and (4) of this rule;
- (b) Provide written verification of at least 60 hours of formal training from an Authority-approved training center as defined in OAR 333-002-0060.

(7) Signed language interpreters may apply to be on the central registry without having a Registry of Interpreters for the Deaf (RID) certification by proving proficiency through a proficiency exam approved by the Authority such as the American Sign Language Proficiency Interview (ASLPI) or the Sign Language Proficiency Interview (SLPI; ASL) with a minimum proficiency level of 4 or advanced.

(8) The Authority may accept formal training from entities outside of Oregon that demonstrate their criteria are equal to or exceed Oregon's criteria as established by these rules.

STATUTORY/OTHER AUTHORITY: ORS 413.558

STATUTES/OTHER IMPLEMENTED: ORS 413.556, 413.558

AMEND: 333-002-0050

RULE TITLE: Application Procedure

NOTICE FILED DATE: 02/25/2022

RULE SUMMARY: Updates application procedure, including elimination of application fees in order to improve access to interpreters.

RULE TEXT:

- (1) Upon request, the Authority shall provide an application packet or a link to the Health Care Interpreter (HCI) application to any individual seeking certification or qualification as an HCI.
- (2) Applicants shall submit required forms and supplemental materials, including proof of formal training and a copy of any Authority-approved national certification, if applicable, to the Authority.
- (3) To meet testing requirements, applicants shall authorize an Authority-approved testing center to provide the Authority with proof of their test results.
- (a) Requests for language proficiency testing or certification testing shall be made directly to the approved testing center.
- (b) Required testing fees shall be paid directly to the approved testing center.
- (c) Test results shall become part of the applicant's permanent record.
- (4) Supplemental materials in languages other than English shall be accompanied by:
 - (a) An accurate translation of those documents into English; and
 - (b) A signed and dated translator's certificate, from a translator other than the applicant and not related to the applicant by blood or marriage, stating that the documents provided are a true and accurate translation and that the translator is not related to the applicant. If there are no other translators available other than those related to the applicant by blood or marriage, then the translator shall provide a written statement of their relationship to the applicant, their translator qualifications, and a statement that there is no conflict of interest created.
 - (c) The applicant shall pay for any translation costs for documents required by the Authority.
- (5) Upon submission of the application, the applicant will receive an auto-generated email confirming the application has been received. If the Authority determines that the application is not complete or that the required documentation is not acceptable, the Authority shall notify the applicant within 30 days of receipt.
- (6) The Authority shall notify the applicant of the Authority's determination on the application no later than 60 days after the date the completed application is received by the Authority.
- (7) Applicants may withdraw from the process at any time by providing written notification to the Authority.

STATUTORY/OTHER AUTHORITY: ORS 413.558

STATUTES/OTHER IMPLEMENTED: ORS 413.556, 413.558

AMEND: 333-002-0060

RULE TITLE: Formal Training

NOTICE FILED DATE: 02/25/2022

RULE SUMMARY: Updates application requirements and clarifies standards for materials.

RULE TEXT:

Applicants seeking Health Care Interpreter (HCI) certification or qualification shall provide written verification of the successful completion of at least 60 hours of Authority-approved formal training, including a minimum of:

- (1) Fifty-two hours of integrated medical terminology, anatomy and physiology, introductory health care interpreting concepts and modes, including supervised practice; and
- (2) Eight hours of Health Care Interpreting Ethics.

STATUTORY/OTHER AUTHORITY: ORS 413.558

STATUTES/OTHER IMPLEMENTED: ORS 413.556, 413.558

AMEND: 333-002-0070

RULE TITLE: Approval of Testing Centers, Skill Evaluation and Assessment

NOTICE FILED DATE: 02/25/2022

RULE SUMMARY: Updates education requirements to provide for more access through equivalency and alignment with national standards.

RULE TEXT:

- (1) The Authority shall enter into a memorandum of agreement with interpreter certification testing centers and language proficiency testing centers establishing the manner and means for testing Oregon applicants for health care interpreter certification and qualification, and including a process for sharing testing information with the Authority and the applicant. Equivalent standards include having an organization or community that represents limited English proficient members provide language proficiency testing for languages that do not have a test available.
- (2) Authority-approved interpreter testing centers shall test interpreting performance in at least two interpreting modes.
- (3) The Authority shall maintain and make readily available to the public a list of approved interpreter certification testing centers and language proficiency testing centers.
- (4) The Authority may proctor testing and determine testing locations if the approved interpreter testing centers do not have their own testing centers and the ability to verify the applicant's identity before testing.
- (5) The Authority will accept testing of American Sign Language proficiency when an applicant provides documentation of:
 - (a) Passing a skill evaluation offered by the American Sign Language Proficiency Interview (ASLPI) at rating of 4 or above; or
 - (b) A Signed Language Proficiency Interview conducted in American Sign Language (SLPI:ASL) at a rating of advanced or above; or
 - (c) Meeting equivalent language proficiency requirements set by the Authority as outlined in this Section.
- (6) Government issued photo identification showing the name and address of the applicant such as a valid driver's license, state identification card, military identification, current passport, or immigration or naturalization documents shall be presented before an individual enters an evaluation or assessment.
- (7) An applicant whose conduct interferes with or disrupts the testing process may be dismissed and disqualified from future evaluations and assessments. Such conduct includes but is not limited to the following behaviors:
 - (a) Giving or receiving evaluation or assessment data, either directly or indirectly, during the testing process.
 - (b) Failing to follow oral or written instructions related to conducting the evaluation or assessment, including termination times and procedures.
 - (c) Introducing unauthorized materials during any portion of the evaluation or assessment.
 - (d) Attempting to remove evaluation or assessment materials or notations from the testing site.
 - (e) Falsifying or misrepresenting educational credentials or other information required for admission to the evaluation or assessment.
- (8) Applicants needing accommodation because of a disability may apply to the testing center for accommodations to complete an evaluation or assessment.
- (9) Test questions, scoring keys, and other data used to administer evaluations and assessments are exempt from disclosure under ORS 192.410 through 192.505.
- (10) The Authority may release statistical information regarding evaluation or assessment pass or fail rates by group, evaluation or assessment type, and subject area to any interested party.

STATUTORY/OTHER AUTHORITY: ORS 413.558

STATUTES/OTHER IMPLEMENTED: ORS 413.556, 413.558

AMEND: 333-002-0120

RULE TITLE: Continuing Education

NOTICE FILED DATE: 02/25/2022

RULE SUMMARY: Language standardization.

RULE TEXT:

- (1) To qualify for central registry renewal, certified and qualified health care interpreters shall sign and submit to the Authority the designated forms and verification showing the individual has completed the required continuing education.
- (2) To maintain eligibility for central registry renewal, certified and qualified health care interpreters shall complete 24 hours of Authority-approved continuing education during the 48-month central registry period, including:
 - (a) Six hours of continuing education on health care interpreter ethics.
 - (b) Six hours of continuing education on interpreting skills.
 - (c) An additional 12 hours that cover any topics accepted for continuing education by interpreter certification testing centers on the Authority maintained list provided for in OAR 333-002-0070.
- (3) Continuing education records shall be maintained by registered health care interpreters for a minimum of four years.
- (4) Continuing education hours taken in excess of the required number in a renewal period may not be carried over to the next renewal period.

STATUTORY/OTHER AUTHORITY: ORS 413.558

STATUTES/OTHER IMPLEMENTED: ORS 413.556, 413.558

AMEND: 333-002-0140

RULE TITLE: Letter of Qualification

NOTICE FILED DATE: 02/25/2022

RULE SUMMARY: Eliminates requirement that individual issued a letter of qualification upgrade to certification after 48 months in order to remain on the central registry.

RULE TEXT:

(1) If the Authority determines that the qualification requirements in OAR 333-002-0040, 333-002-0050, and 333-002-0060 and any applicable renewal requirements have been met, a letter of qualification shall be issued.

(2) Letters of qualification are valid for 48 months from the date of issue and are renewable.

STATUTORY/OTHER AUTHORITY: ORS 413.558

STATUTES/OTHER IMPLEMENTED: ORS 413.556, 413.558

AMEND: 333-002-0150

RULE TITLE: Letter of Certification

NOTICE FILED DATE: 02/25/2022

RULE SUMMARY: Punctuation update.

RULE TEXT:

(1) If the Authority determines that the certification requirements in OAR 333-002-0040, 333-002-0050 and 333-002-0060 and any applicable renewal requirements have been met, a letter of certification shall be issued.

(2) Letters of certification are valid for 48 months from the date of issue and are renewable.

STATUTORY/OTHER AUTHORITY: ORS 413.558

STATUTES/OTHER IMPLEMENTED: ORS 413.556, 413.558

AMEND: 333-002-0170

RULE TITLE: Certification and Qualification Renewal

NOTICE FILED DATE: 02/25/2022

RULE SUMMARY: Eliminates requirement that individual issued a letter of qualification upgrade to certification after 48 months in order to remain on the central registry. Provides for renewal of expired registry.

RULE TEXT:

- (1) Certified or qualified health care interpreters who intend to maintain enrollment in the central registry shall renew their certification or qualification every 48 months.
- (2) At least 60 days before the expiration of certification or qualification, an applicant for renewal shall submit:
 - (a) A signed copy of the Authority provided commitment form acknowledging that the applicant has read and agrees to abide by the National Code of Ethics for Interpreters in Health Care or the Registry of Interpreters for the Deaf (RID) Code of Professional Conduct, as applicable.
 - (b) Written verification showing the individual has maintained eligibility for central registry renewal by completing the continuing education required:
 - (A) For qualification, the continuing education required by OAR 333-002-0120.
 - (B) For certification, the continuing education required by OAR 333-002-0120 and any additional hours required by the applicant's national certifying body during the preceding four years. Actual recertification by the national body is not required.
 - (c) For applicants seeking renewal as a qualified health care interpreter for American Sign Language, written verification of at least 60 hours of formal training from an Authority-approved training center as defined in OAR 333-002-0060. These training hours are in addition to the continuing education required by OAR 333-002-0120.
- (3) The date of submission shall be considered to be the date materials are received by the Authority by fax, mail, electronic mail or hand delivery.
- (4) If the qualification or certification has not been renewed within 1 year (12 months) of the expiration date, the HCI shall re-apply as a new applicant.

STATUTORY/OTHER AUTHORITY: ORS 413.558

STATUTES/OTHER IMPLEMENTED: ORS 413.556, 413.558

AMEND: 333-002-0190

RULE TITLE: Denial, Revocation, Suspension or Refusal to Renew Status for Certification and Qualification

NOTICE FILED DATE: 02/25/2022

RULE SUMMARY: Language alignment. Removes language related to conviction of crimes to align with the removal of the background check requirement.

RULE TEXT:

(1) The Authority shall deny, revoke, suspend or refuse to renew a letter of certification or qualification if:

- (a) An applicant for an initial certification or qualification fails to meet the eligibility standards of OAR 333-002-0040.
- (b) An applicant for certification or qualification renewal fails to comply with the requirements of OAR 333-002-0170.
- (c) An applicant submits information that cannot be verified.

(d) An applicant engages in conduct or practices found by the Authority to be in violation of the National Council on Interpreting in Health Care Code of Ethics, the National Council on Interpreting in Health Care Standards of Practice, or the Registry of Interpreters for the Deaf (RID) Code of Professional Conduct, as applicable.

(2) The Authority may deny, revoke, suspend, or refuse to renew a certification or qualification, or impose remedial education or corrective actions on an applicant or central registry enrollee, if the individual engages in any of the following conduct:

(a) Representing that the applicant or enrollee is an Oregon certified or qualified health care interpreter without having been issued a valid letter of certification or qualification by the Authority.

(b) Knowingly giving false information to the Authority.

(c) Violating the credentialing process by:

(A) Falsifying or misrepresenting education credentials or other information required for admission to an evaluation or assessment.

(B) Having an impersonator take an evaluation or assessment on the applicant or enrollee's behalf.

(C) Impersonating an applicant or enrollee.

(d) Having a credential to provide health care interpreting services in another state, territory or country, or issued by another certifying entity denied, revoked or suspended based on behavior by the individual similar to acts described in this rule.

(e) Allowing the use of an Authority issued credential by a non-credentialed person.

(f) Presenting another person's credential as the applicant or enrollee's own credential.

(g) Impersonating another Oregon certified or qualified HCI.

(h) Practicing health care interpreting services under a false or assumed name.

(i) Using or attempting to use a credential that has been revoked, suspended, or lapsed.

(j) Practicing or offering to practice beyond the scope of the National Code of Ethics or National Standards of Practice for Interpreters in Health Care, or the Registry of Interpreters for the Deaf (RID) Code of Professional Conduct, as applicable.

(k) Engaging in false, deceptive or misleading advertising of the applicant or enrollee's certification or qualification credentials.

(A) False, deceptive or misleading advertising includes but is not limited to advertising health care interpreting services using the terms "Oregon qualified" or "Oregon certified" health care interpreter in any private or public communication or publication when not credentialed by the Authority.

(B) Advertising includes telephone directory listings, business cards, social media networking, or any other source of public communication.

(l) Failing to comply or cooperate with an Authority request in any way, including but not limited to a credentialing action or disciplinary proceeding, including:

(A) Failing to submit requested papers or documents.

(B) Failing to submit a written response to complaints filed with the Authority.

(C) Failing to respond to requests for information issued by the Authority whether or not the applicant or enrollee is accused in the proceeding.

(m) Failing to comply with an "assurance to desist" the applicant or enrollee entered into with the Authority.

STATUTORY/OTHER AUTHORITY: ORS 413.558

STATUTES/OTHER IMPLEMENTED: ORS 413.556, 413.558

AMEND: 333-002-0230

RULE TITLE: Hearings

NOTICE FILED DATE: 02/25/2022

RULE SUMMARY: Language alignment.

RULE TEXT:

An individual who wishes to contest the denial, non-renewal, suspension or revocation of their central registry enrollment, qualification or certification may request a contested case hearing. The contested case hearing process is conducted in accordance with ORS 183.441 through 183.497 and the Attorney General's Uniform and Model Rules of Procedure for the Office of Administrative Hearings, OAR 137-003-0501 through 137-003-0700.

STATUTORY/OTHER AUTHORITY: ORS 413.558

STATUTES/OTHER IMPLEMENTED: ORS 413.556, 413.558

RULE SUMMARY: Outlines provider requirements for use of Health Care Interpreters not on the central registry, including good faith effort and documentation requirements. Includes delayed implementation for remote interpreting.

RULE TEXT:

(1) Beginning July 1, 2022, for onsite interpreting and no later than July 1, 2023, for remote interpreting, health care providers shall work with qualified or certified health care interpreters from the Authority's health care interpreter central registry when arranging for or providing services to a person with LEP or who prefers to communicate in a language other than English or who communicates in signed language. Exceptions are allowed when the provider:

- (a) Has documented proficiency in the preferred language of the person with limited English proficiency or communicates in the signed language of choice. Evidence of proficiency shall be made available to the Authority and relevant provider licensing and certification boards upon request. In addition to documenting proficiency, the health care provider shall adopt a language services policy, and abide by language proficiency requirements, consistent with nationally recognized professional standards of care as outlined by organizations such as the American Medical Association, the Joint Commission, the National Committee for Quality Assurance or another equivalent national standard; or
- (b) Has made a good faith effort to obtain a health care interpreter from the central registry and has found that none are available to provide interpreting. In this circumstance, the health care provider may work with the non-registered interpreter for that visit or episode of care. For each visit or episode of care that a provider works with a non-registered interpreter, the provider shall create and maintain records of the good faith efforts made by the provider to work with an interpreter from the central registry. Evidence of good faith efforts shall be made available to the Authority and relevant provider licensing and certification boards upon request. The Authority may release additional guidance on good faith efforts in the future. At a minimum, providers shall develop and maintain policies, processes, and outcomes describing:
 - (A) The steps the provider takes to work with an interpreter from the central registry for a health care appointment;
 - (B) The efforts the provider makes to reduce reliance on interpreters who are not on the central registry; and
 - (C) How the provider efforts are increasing the number of health care interpreting appointments scheduled with interpreters from the central registry; or
- (c) Has maintained records that the person with LEP or who is Deaf or Hard of Hearing was offered services of a health care interpreter from the health care interpreter central registry at no cost to the person with LEP or who is Deaf or Hard of Hearing and the person with LEP or who is Deaf or Hard of Hearing has declined and chosen a different interpreter.

(2) Beginning July 1, 2022, health care providers shall maintain records of each encounter in which the provider worked with a health care interpreter from the health care interpreter central registry or worked with an interpreter not on the central registry and met one of the exceptions in section (1) of this rule. Records for interpreting services provided on or after September 1, 2022, shall be provided to the Authority upon the Authority's request. The record shall include:

- (a) The full name of the health care interpreter.
- (b) The health care interpreter's central registry number, if applicable.
- (c) The language interpreted.

(3) Health care providers shall provide personal protective equipment, consistent with established national standards, to health care interpreters providing services on-site at no cost to the interpreter. The health care provider shall not require that the health care interpreter procure the health care interpreter's own personal protective equipment as a condition of working with the health care provider.

(4) Health care providers billing the Medicaid Fee-For-Service program for their services must also comply with Medicaid requirements outlined in OAR Chapter 410, Division 120 when working with a person with limited English

proficiency or one who is Deaf or Hard of Hearing.

STATUTORY/OTHER AUTHORITY: ORS 413.558

STATUTES/OTHER IMPLEMENTED: ORS 413.556, ORS 419.558

ADOPT: 333-002-0270

RULE TITLE: Interpreting Service Companies

NOTICE FILED DATE: 02/25/2022

RULE SUMMARY: Outlines requirements for interpreting service companies to provide for use of registered Health Care Interpreters, and for referral of interpreters not on the central registry, including documentation requirements. Includes delayed implementation.

RULE TEXT:

(1) Beginning September 1, 2022, for onsite interpreting and no later than July 1, 2023, for remote interpreting, an interpreting service company shall arrange for a health care interpreter to provide interpreting services only when the health care interpreter is listed on the central registry. An interpreting service company may only arrange for a health care interpreter who is not listed on the central registry when:

(a) The health care provider informs the interpreting service company that the health care provider has followed the requirements outlined in OAR 333-002-0250; or

(b) No health care interpreter on the central registry who is available in the requested language is employed or contracted with the interpreting service company.

(2) Beginning September 1, 2022, an interpreting service company shall maintain records for each referral of a health care interpreter to work with a health care provider. These records shall be provided to the Authority upon the Authority's request. The record shall include:

(a) The full name of the health care interpreter.

(b) The health care interpreter's central registry number, if applicable.

(c) The language being interpreted.

(3) An interpreting service company shall not represent to a health care provider that a contracted or employed health care interpreter referred by the company is a qualified or certified health care interpreter unless the interpreter has met the requirements for qualification or certification as outlined in OAR 333-002-0150 and has been issued a valid letter and central registry enrollment number.

(4) An interpreting service company shall not require that a health care interpreter procure the health care interpreter's own personal protective equipment as a condition of receiving a referral.

STATUTORY/OTHER AUTHORITY: ORS 413.558

STATUTES/OTHER IMPLEMENTED: ORS 413.556, ORS 419.558

ADOPT: 333-002-0290

RULE TITLE: Coordinated Care Organizations (CCOs)

NOTICE FILED DATE: 02/25/2022

RULE SUMMARY: Outlines requirements for Coordinated Care Organizations to work with Health Care Interpreters on the central registry.

RULE TEXT:

When interacting with a recipient of Medicaid or a caregiver of a recipient of Medicaid, who has limited English proficiency or who prefers to communicate in a language other than English or who communicates in signed language, Coordinated Care Organizations shall work with qualified or certified health care interpreters from the central registry as detailed in OAR Chapter 410, Division 141.

STATUTORY/OTHER AUTHORITY: ORS 413.558

STATUTES/OTHER IMPLEMENTED: ORS 413.556, ORS 419.558

GILKER Heather * BCE

From: Jaci Bergstrom [REDACTED] >
Sent: Friday, February 18, 2022 10:06 AM
To: OBCE Oregon * BCE
Cc: Bill Moreau
Subject: Guide to Policy and Practice
Attachments: OBCE Cover.docx; Jaci Cost Functional-Resume-2021.docx

Good morning,

I am interested in participating on the panel for the Guide to Policy and Practice. Please find attached my cover letter and resume.

All the best,
Jaci Bergstrom

Jaci Bergstrom, DC

Clinical Supervisor
Connected Whole Health
University of Western States
8000 Tillamook St.
Portland, OR 97213
Direct Dial: (503) 847-2565
Office of Clinics: 503-271-6771
Fax (503)251-5794
Email [REDACTED] Web: <http://www.uws.edu>

Jaci M. Bergstrom, D.C, M.A in Mgmt

■■■■ • Vancouver, Washington 98682 • ■■■■ • ■■■■

OBJECTIVE

Seeking a position with the Board on the Guide to Policy and Practice to assist in the revision of the scope of practice within the field of Chiropractic for the state of Oregon.

PROFESSIONAL PROFILE

Motivated, personable business professional with multiple college degrees and a successful 5-year track record of profitable small business ownership. Diplomatic and tactful with professionals and non-professionals at all levels. Utilization of best practices for intern and personal growth.

Dedication to student growth through guidance, compassion, inclusion and instruction in chiropractic practice.

Flexible and versatile – Poised and competent with demonstrated ability to easily transcend cultural differences. Thrive in deadline-driven environments. Excellent leadership, communication and team-building skills.

KEY TALENT

- | | | |
|-------------------------|--------------------------------------|------------------------------|
| • Business Operations | • Communications Skills | • Marketing & Sales |
| • Leadership/Management | • Organizational Development | • Insurance Billing |
| • Customer Service | • Strategic & Tactical Planning | • Front-Office Operations |
| • Problem Resolution | • Functions well in team environment | • Professional Presentations |

PROFESSIONAL HISTORY

COMMUNICATION: REPORTS/PRESENTATIONS

- Communicate directly with upper management, supervisors, administration, peers and referral-based practices for the good of the student and patient.
- Author professional correspondence for patient charting.
- Design and deliver series of classes for advanced learning opportunities in rehabilitation, charting, adjustive technique and eMedley.
- Conduct one-on-one sessions with interns to discuss individual growth and expectations.
- Communicate medical concepts to patients using layman's terms to facilitate understanding and provide example to interns.
- Nutritional and exercise counseling and education regarding healthy lifestyle changes.
- Preview day panelist providing a brief video on communication and its importance.

DETAIL MASTERY & ORGANIZATION

- Management experience in all aspects of day-to-day operations as owner/practitioner of Chiropractic Concepts from 2007-2012.
- Team lead over six other clinicians providing feedback to supervisor, communication to and from faculty as well as the voice for the clinical department.
- Manage approximately 20 interns each quarter in varying capacity including, but not limited to, patient assignment, intern assessment, application of grades and organization of all necessary data for competency and successful completion of graduation requirements.

Jaci M. Bergstrom, D.C, M.A in Mgmt

• Vancouver, Washington 98682 •

EMPLOYMENT HISTORY

UNIVERSITY OF WESTERN STATES NOV 2020 - PRESENT

Clinical Supervisor

UNIVERSITY OF WESTERN STATES AUG 2018-NOV 2020

Doctor of Chiropractic/Clinical Educator

CLACKAMAS INJURY REHABILITATION AND WELLNESS AUG 2014 - AUG 2018

Doctor of Chiropractic

PACIFIC HEALTH CARE FEB 2013 - JULY 2014

Doctor of Chiropractic

CHIROPRACTIC CONCEPTS MAY 2007 – MAY 2012

Owner – Doctor of Chiropractic

FIEBIGER CHIROPRACTIC MARCH 2006 – MAY 2007

Doctor of Chiropractic

CROSSROAD CHIROPRACTIC MAY 2005 – JANUARY 2006

Doctor of Chiropractic

FRELJE CHIROPRACTIC JANUARY 2002 – JULY 2004

Doctor of Chiropractic

EDUCATION

COLLEGE OF ST. SCHOLASTICA, – 2005

Master of Arts, Management

NORTHWESTERN COLLEGE OF CHIROPRACTIC – 2001

Doctor of Chiropractic ~ Licensed Acupuncturist

VALLEY CITY STATE UNIVERSITY – 1998

Bachelor of Arts, Biology

CONTINUING EDUCATION

Complete Curriculum Vitae Available

AFFILIATION

- Member of the Oregon Chiropractic Association 2014-Present
- Quality Patient Care Committee member 2020-Present
- Learning Assessment Committee- July, 2021-Present
- Curriculum Work Group- July 2021-Present
- NBCE site visit
- PTA for Harmony Elementary School September 2021-present

Jaci M. Bergstrom, D.C, M.A in Mgmt

• Vancouver, Washington 98682 •



UNIVERSITY of WESTERN STATES
Health Center

8000 NE Tillamook Street | Portland, OR 97213 | www.uws.edu
Phone: 503-255-6771 | Fax: 503-251-2837

February 18, 2022

Dr. Jaci Bergstrom

[REDACTED], Vancouver, WA 98682

M: [REDACTED]

Oregon Board of Chiropractic Examiners:

I read with interest your posting seeking members to serve on the committee for Guide to Policy and Practice (P & P) to review, research, update, modernize, and make revision recommendations to this policy as needed.

As my resume indicates, I possess 20 years of progressive chiropractic experience. My professional history includes both private practice and higher education. I have worked as an associate and business owner. At the University of Western States, I have served as the clinical educator and currently as the clinical supervisor.

My current job responsibilities include reviewing, revising and updating many aspects of our clinician assignments and processes for the clinic. Being employed by UWS, I feel we are researching and proving education insight to new chiropractors each day on standards of care for the scope of practice for the Chiropractic field. I would enjoy having input into the practice scope in the state of Oregon as we continue to develop students in the field of Chiropractic.

All the best,
Dr. Jaci Bergstrom

GILKER Heather * BCE

From: Boothby Judith [REDACTED]
Sent: Monday, February 07, 2022 8:55 AM
To: OBCE Oregon * BCE; MCLEOD-SKINNER Cass * BCE
Subject: Re: [OBCE_Publication] OBCE - P&P Committee Opportunity
Attachments: Curriculum Vitae for Judith Boothby MS DC PC 2-4-2022.docx

Dear OBCE

I am interested in becoming a member of the Guide to Policy and Practice Committee of the OBCE. I have attached my CV.

I was a past member of the ETDSP committee from 1996 thru 2016

I headed the committee which wrote the ETDSP rule and got it passed by the OBCE 12/19/95

I participated in creating petition to the OBCE which established chiropractic functional neurology as standard 1/14/14

I founded the functional council of chiropractic with the OCA

Help establish chiropractors presenting case studies at the OCA convention 2012-2019

Please let me know you received my CV

Sincerely,

Judith Boothby, MS DC PC

On Thursday, February 3, 2022, 09:19:40 AM PST, OBCE Oregon * BCE <info@obce.oregon.gov> wrote:

This message is being sent to all licensees and certificate holders.

The OBCE has established a committee to review, research, update, modernize, and make revision recommendations to the Board on the Guide to Policy and Practice (P & P) and continue the work of the P & P Workgroup. The committee membership will consist of 7-9 members, with members who are active and practicing Oregon licensed DCs, those in academia, and those who are recently inactive/retired.

The specific topics to be researched, discussed, and make recommendations about include, but are not limited to:

- Allergy and Food Sensitivity Testing
- Cosmetology

- Energy Medicine Devices
- Biofeedback
- Soundwave Therapy
- Magnetic Therapy
- Breast Thermography
- Dark Field Microscopy
- Minor Surgery
- Low Level Light Therapy
- Hyperbaric Oxygen Therapy and Concentrated Oxygen
- IMEs
- Primary Care/Portal of Entry
- Death Certificates
- DOT/CTL Examinations
- Substances and Supplements
- Auriculotherapy

The P & P Committee is an advisory committee and will make recommendations to the Board as to possible revisions to the P & P. These recommendations will then be reviewed by the Board for possible further action and adoption.

To apply, please provide a cover letter and resume to info@obce.oregon.gov **no later than 5pm on Friday March 11, 2022.**

Oregon Board of Chiropractic Examiners

530 Center St NE, Suite 620

Salem, OR 97301

503-373-1573

info@obce.oregon.gov

www.oregon.gov/obce



*****CONFIDENTIALITY NOTICE*****

This e-mail may contain information that is privileged, confidential, or otherwise exempt from disclosure under applicable law and/or ORS 676.175. If you are not the addressee or it appears from the context or otherwise that you have received this e-mail in error, please advise me immediately by reply e-mail, keep the contents confidential, and immediately delete the message and any attachments from your system.

Curriculum Vitae for Judith Boothby MS DC PC

Work Address:

Judith Boothby MS DC PC

[REDACTED]
Portland, OR 97214

Work Phone: [REDACTED]

Home Phone [REDACTED]

Email: [REDACTED]

Personal Information:

Date of Birth: [REDACTED]

Place of Birth: Boston, Massachusetts

Citizenship: United States

Sex: Female

Employment History:

- Oregon Chiropractic from 1986 through 2019, 2021 thru present
- Iowa Chiropractic, 2020
- Somerville, Massachusetts, Chiropractic from 5/1988 thru 6/1989
- Massachusetts General Hospital, Department of Radiology from 5/88 thru 6/89
Also worked at MGH for MIT thesis 9/79 thru 12/80. Wrote computer programs to upgrade radiation treatment planning from two to three dimensions thus preserving function and reducing morbidity.
- Lawrence Berkeley National Laboratory, Berkeley, CA consulting for 1 week 1986
- UCSF Long Hospital, San Francisco, CA, consulting for 2 weeks 1986
- Mt, Hood Community College, Gresham, OR Taught a class in in the drafting department on auto-cad and design 1983 and 1984
- Thermal Dynamics, West Lebanon, NH Employed as a mechanical engineer. Designed Plasma Welding Equipment 1981-82
- General Electric, Somersworth, NH Apprentice machinist 1976-78

License: Oregon Board of Chiropractic Examiners, license #27 2207

Education:

Western States Chiropractic College, Graduated 1986 DC Doctor of Chiropractic

Massachusetts Institute of Technology, Graduated 1981 MS in Mechanical Engineering

University of New Hampshire, Graduated 1979 BS in Mechanical Engineering

Hamburg High School, Graduated 1975

Additional training:

Functional Neurology with the Carrick Institute 2010-12

Pediatric Functional Neurology with Robert Melillo DC PhD, 9/2012-4/13

Awards:

- Voted Top Doc in Portland Monthly's Top Doctors Magazine January 2014 and 2015. Was the featured chiropractor January 2013 which was the first time chiropractic was mentioned in the Top Doctors publication.
- Chiropractor of the Year, Oregon Doctors of Chiropractic 2005 for standing up for the right of patients to receive low risk nurturing health care.
- Young Chiropractor of the Year, Chiropractic Association of Oregon 1996 for leading committee of the CAO instrumental in writing proposal to OBCE for OAR 811-015-0070 Scope of Practice Regarding Examinations, Tests, Substances, Devices and Procedures

Volunteer activities:

Current:

- Returning Veterans Project
- Camp Victory. Empowering girls who have been sexually assaulted.

Past:

- Created Functional Chiropractic Council of the OCA
- Helped to establish presenting Case Studies at the OCA convention
- Participated in creating petition to OBCE which established chiropractic functional neurology as standard on January 14, 2014
- Member OBCE -ETDSP committee from 1996 thru 2016
- Mentor for Chick Tech. Opportunities for high school girls to pursue STEM
- Children's Relief Nursery
- Council for Prostitution Alternatives
- Taught English as a second language, Rockwood library

Publications:

Judith Boothby MS DC PC, Shelly Coffman, PT DPT OCS FAAOMPT CSCS, Todd Turnbull DC. Successful Interprofessional Treatment of Juvenile Rheumatoid Arthritis: A Case Report, IMCJ Integrative Medicine: A Clinician's Journal, April/May 2017, Vol 16, No 2 <http://www.imjournal.com/index.cfm/fuseaction/Content.Main/id/92/OA-SuccessfulInterprofessionalTreatmentofJuvenileRheumatoidArthritis:ACaseReport>

Survivor Stories, Speaking Out About Cancer, Edited by Rod Schecter and Jessica Lynn Myers. Rivanna Health Publications, Charlottesville, VA 2003. Calm Down, Little Cells by Judith Boothby

Hobbies: Racing Dragon Boats, walking

GILKER Heather * BCE

From: Chris Chlebowski <[REDACTED]>
Sent: Monday, February 28, 2022 11:25 AM
To: OBCE Oregon * BCE
Subject: P & P Committee application
Attachments: P&P cover letter.docx; JCC March 2022 Resume.doc

Dear Sir/Madam,

Attached you will find my resume and cover letter for consideration for a position on the P & P committee.

Sincerely,

Dr. Chris Chlebowski

c: [REDACTED]

Dr. Chris Chlebowski
homeopath - chiropractor - naturopath
ashlandnaturalmedicine.com

CURRICULUM VITAE

DR. CHRIS CHLEBOWSKI

EDUCATION

National College of Natural Medicine <i>Doctorate of Naturopathy</i>	Portland, OR	2007 to 2011
Western States Chiropractic College <i>Doctorate of Chiropractic</i>	Portland, OR	2003 to 2007
Northern Arizona University <i>BSBA, Finance.</i>	Flagstaff, AZ	1997 to 2000

CLINICAL EXPERIENCE

Medical Director	Ashland, OR	2012 to present
Multi disciplinary clinic focused on the treatment of chronic disease. Primarily cancer, neurological disorders and chronic infections. Strong focus on classical homeopathy, herbal therapy, manual medicine, IV therapy/chelation and hyperbaric oxygen.		
Private Practice	Portland, OR	2007 to 2012
Chiropractic/naturopathic practice. Specialties include classical homeopathy, pediatrics, manual medicine, botanicals and nutrition. Focus on pediatrics and family medicine. Treatment of chronic disease as well as musculoskeletal issues.		

TEACHING EXPERIENCE

National University of Natural Medicine	Portland, OR	2018-2020
Designed curriculum for Introduction to Homeopathy course for first year naturopathic students.		
Co-taught class to 60 + students		

Ashland Institute of Massage Ashland, OR 2012- 2018

Designed curriculum for, and instructed, 18 hour course in anatomy, physiology and pathology of the neurological systems. Two concurrent classes of 15+ students per year.

Om Sweet Om Yoga Teacher training Ashland, OR 2013 – 2016

Twice a year two-day course in anatomy and holistic medicine for 30+ future yoga teachers. Helping future yoga instructors understand disease in the context of a yoga practice.

ADDITIONAL EDUCATION

New England School of Homeopathy Amherst, MA 2010 to present

Training in classical homeopathy.

International Chiropractic Pediatrics Association

Near completion of three year training in chiropractic pediatrics

PUBLICATIONS

Similimum– November. 2016. Journal of Homeopathic Academy of Naturopathic Physicians.

Townsend Letter – February 2017 issue.

NDNR - September 2018 issue. Naturopathic Treatment of Acute Disease

NDNR – October 2018. Naturopathic Treatment of Cardiovascular Disease



2-29-22

To Whom It May Concern:

Thank you for taking the time to review my resume and cover letter. I am writing in response to the posting for a position on the P & P committee to make recommendations to the Board on numerous procedures and techniques.

As you will see from my resume, I am well suited to this position as an actively practicing naturopathic and chiropractic physician who has deep clinical knowledge of many of the topics to be discussed including allergy/sensitivity testing, energy medicine devices, darkfield microscopy, breast thermography, minor surgery, hyperbaric oxygen and supplementation.

I look forward to hearing from you soon.

Sincerely,

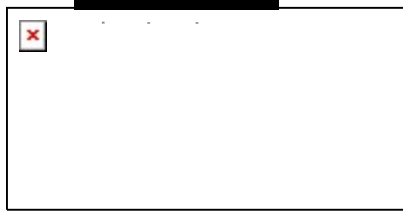
Dr. Chris Chlebowski

GILKER Heather * BCE

From: Dennis Cozzocrea [REDACTED] >
Sent: Thursday, February 03, 2022 4:38 PM
To: OBCE Oregon * BCE
Subject: P&P Work Group
Attachments: SKM_C45822020316360.pdf

Attached is my letter of interest in the P&P Work Group and my CV
Thanks for your consideration,

Dennis Cozzocrea, DC
"Portland's Gentle Chiropractor"
www.gentlechiro.com
Office: Text or Call 503-512-9591
Cell: [REDACTED]



----- Forwarded message -----

From: [REDACTED]
Date: Thu, Feb 3, 2022 at 4:36 PM
Subject: Message from KM_C458
To: [REDACTED]



February 3, 2022

RE: Policy and Practice Work Group Application

To Whom it may concern:

I would like to be considered for the position as a member of the Policy and Practice work group that you recently sent an email regarding.

I have practiced for about 32 years and have always been interested in the procedures and therapies that would be best and safest for my patients.

I have used numerous modalities and techniques over the course of my practice. I have also submitted my curriculum vitae with this letter.

Sincerely,

A black rectangular box redacting the signature of Dennis M. Cozzocrea.

Dennis M. Cozzocrea, DC

RECEIVED

FEB - 7 2022

OREGON BOARD OF
CHIROPRACTIC EXAMINERS

Dennis M. Cozzocrea, DC



Current Status:

I have been a Chiropractor since 1990 and in 2015 I moved to Portland. I have always been an active member of the state association in both states. I have also been a monthly contributor to the Chiropractic Political Action Committee in both states. I served on the WSCA for 4 years and currently serve on OCA board.

Education:

1990: Palmer College of Chiropractic, Davenport, IA

- ★ Achieved Research Honors and GPA 3.17
- ★ Outstanding Graduate Award
- ★ Involved in many organizations during my time at Palmer College

1983-1986: City Colleges of Chicago

Work Experience:

2015 - Present: Own and Operate Gentle Chiro in Tigard, OR (www.gentlechiro.com)

- ★ Purchased from Dr. Victoria Collins, who retired

2005 - 2015: Multi-disciplinary Practice: 6000 s.f. building that I owned and operated.

- ★ We went from 2 → 20 staff during the first 2 years.
- ★ We offered a variety of integrative services.
- ★ Services offered: MD, DC with rehab, Acupuncture, Psychologist, Massage, Esthetics, Yoga, Reflexology, Auriculotherapy, Cold Laser, Lipo-Laser, Weight loss, Whole Food Nutrition and 3 full time Nutritional Therapists

1990 - 2005: Single Doctor Chiropractic office with a moderate amount of nutrition.

Other Experience:

2009 - 2015: Taught Functional Nutrition Seminars to DC's, MD's, LaC's, Nutritionists in various locations around the U.S.

2010 - 2013: Served on ZYTO Scientific Advisory Board

2007 - 2015: Hosted a weekly radio talk show on Alternative Health for Clear Channel.

1998-2001: Served as a board member of Washington State Chiropractic Assoc.

1983 -1986: Served in the U.S. Army in Germany and also learned fluent German

References:

Lori Grassi, Washington State Chiropractic Association (WSCA) Executive Director

Doug Long, DC (Served on WSCA with me) 253-473-0300

David Butters, DC (WA Chiro PAC & WSCA) (206) 723-2820

Mark Johansen, DC, Portland, OR (503) 255-7746

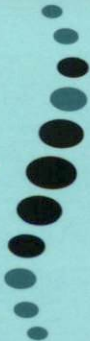
DENNIS COZZOCREA, DC



Text or Call 503.512.9591

8905 SW Nimbus | Suite 140 | Beaverton, OR | gentlechiro.com

Portland's Gentle Chiropractor





February 3, 2022

RE: Policy and Practice Work Group Application

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Sincerely,

A black rectangular box redacting the signature of Dennis M. Cozzocrea, DC. There are faint blue ink marks on the left and right sides of the box.

Dennis M. Cozzocrea, DC

Dennis M. Cozzocrea, DC



Current Status:

I have been a Chiropractor since 1990 and in 2015 I moved to Portland. I have always been an active member of the state association in both states. I have also been a monthly contributor to the Chiropractic Political Action Committee in both states. I served on the WSCA for 4 years and currently serve on OCA board.

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- ★ Services offered: MD, DC with rehab, Acupuncture, Psychologist, Massage, Esthetics, Yoga, Reflexology, Auriculotherapy, Cold Laser, Lipo-Laser, Weight loss, Whole Food Nutrition and 3 full time Nutritional Therapists

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Other Experience:

2009 - 2015: Taught Functional Nutrition Seminars to DC's, MD's, LaC's, Nutritionists in various locations around the U.S.

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1998-2001: Served as a board member of Washington State Chiropractic Assoc.

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Doug Long, DC (Served on WSCA with me) 253-473-0300

David Butters, DC (WA Chiro PAC & WSCA) (206) 723-2820

Mark Johansen, DC, Portland, OR (503) 255-7746

Thomas D. Freedland, D.C.

8196 SW Hall Blvd., Suite 306

Beaverton, Oregon 97008

(503) 684-1273

Chiropractic Physician

Private practice (since 1993) located in Beaverton, Oregon, broad based practice focusing on musculoskeletal conditions resulting from injuries - including sports, work incidents, personal injury, routine activities, and degenerative changes. The office is a participating provider with most managed care organizations and Medicare. Additionally, I have provided medical/health care support for various athletic projects, including the Hood to Coast Relay and the Pacific Crest Triathlon.

I have served on the faculty of University of Western States - Chiropractic College, teaching in areas of clinical documentation and assisting with the Community Based Internship program which allowed student interns to work and observe in my office. I also teach a Continuing Education course for doctors on Clinical Documentation, Physical Examination, and HIPAA compliance.

Since 1996, I have worked with several local and national companies and law firms performing reviews and independent evaluations in Oregon, California, and Washington.

I am credentialed as a Certified Chiropractic Sports Physician (CCSP), a post-graduate program on the injuries that occur with physical activity as well as treatment and rehabilitation.

I previously served as an Assistant Professor/Director of Laboratories at Cleveland Chiropractic College, Los Angeles (1989 – 1993) with teaching emphasis in the areas of diagnosis, laboratory studies, report writing, sports injuries, and emergency care. I also coordinated campus safety, emergency response, and in-service training.

I taught clinical documentation at University of Westerns States for several years, and have been part of their preceptor/post-ceptor programs and I have supervised interns volunteering at area sporting events.

I currently serve as a member of the Peer Review Committee for the Oregon Board of Chiropractic Examiners and have served on several other Board committees since 1995.

Licensing

California State Board of Chiropractic Examiners - 19785

Oregon Board of Chiropractic Examiners - 2762

State of Washington license (Chiropractic) - CH00033624

Academic Training

B.S. - Zoology, California State University, Long Beach - January 1978

Teaching Credential - California Community Colleges,

Health Technologies and Police Sciences - December 1980

D.C. - Doctor of Chiropractic, Cleveland Chiropractic College, Los Angeles –

December 1988; Summa Cum Laude

C.C.S.P. - Certified Chiropractic Sports Physician, ACA Council /Sports Injuries - 1991

CICE - Certified Independent Medical Examiner (ABIME) - October 2001

Allied Health Care Positions

Cardiology Technician - Fountain Valley Regional Hospital and Medical Center (June 1988 to December 1989)

Paramedical Insurance Examiner - Medical Examination Data Services, LA, Ca. (August 1986 to June 1989)

Emergency Medical Technician - Bowers Ambulance Service and Dilday's Ambulance Service - Long Beach, Ca. (September 1974 to November 1977)

Law Enforcement Positions

(Retired from law enforcement after 33 years of service as both regular and reserve officer - May 18, 2011)

Reserve Police Lieutenant - Tigard Police Department. Reserve Commander overseeing Reserve Officer patrol functions and supervision, assist with in-service training and consultant on emergency medical procedures. (January 1994 to May 2011)

Deputy Sheriff (Reserve Forces/Training Officer) - Los Angeles County Sheriff's Department, Aero Bureau / NORSAT / Avalon Station. (May 1986 to November 1993)

Deputy Sheriff/Supervising Line Deputy - Los Angeles County Sheriff's Department. Experience testifying as a narcotics expert and an expert on gang activity. (April 1984 to May 1986)

Police Officer/Training Officer - Downey Police Department. Testified as an expert on gang activity, narcotics, and accident investigation. (August 1979 to April 1984)

Deputy Sheriff - Riverside County Sheriff's Department. (November 1977 to August 1979)

Current as of February 1, 2022

GILKER Heather * BCE

From: Thomas Freedland [REDACTED] >
Sent: Tuesday, March 01, 2022 11:21 AM
To: OBCE Oregon * BCE
Subject: Re: [OBCE_Publication] REMINDER: OBCE - P&P Committee Opportunity
Attachments: OBCE New committee.docx; CV TF 2 28 2022 .docx

Please see the attached letter and CV for consideration in selecting participants for this committee.

Thomas D. Freedland, D.C.
8196 SW Hall Blvd.
Suite 306
Beaverton, Oregon 97008
(503) 684-1273

In a message dated 2/28/2022 10:46:35 AM Pacific Standard Time, info@obce.oregon.gov writes:

This message is being sent to all licensees and certificate holders.

Reminder

The OBCE has established a committee to review, research, update, modernize, and make revision recommendations to the Board on the Guide to Policy and Practice (P & P) and continue the work of the P & P Workgroup. The committee membership will consist of 7-9 members, with members who are active and practicing Oregon licensed DCs, those in academia, and those who are recently inactive/retired.

The specific topics to be researched, discussed, and make recommendations about include, but are not limited to:

- Allergy and Food Sensitivity Testing
- Cosmetology
- Energy Medicine Devices
- Biofeedback
- Soundwave Therapy
- Magnetic Therapy
- Breast Thermography
- Dark Field Microscopy
- Minor Surgery
- Low Level Light Therapy
- Hyperbaric Oxygen Therapy and Concentrated Oxygen
- IMEs
- Primary Care/Portal of Entry
- Death Certificates
- DOT/CTL Examinations

- Substances and Supplements
- Auriculotherapy

The P & P Committee is an advisory committee and will make recommendations to the Board as to possible revisions to the P & P. These recommendations will then be reviewed by the Board for possible further action and adoption.

To apply, please provide a cover letter and resume to info@obce.oregon.gov **no later than 5pm on Friday March 11, 2022.**

Oregon Board of Chiropractic Examiners

530 Center St NE, Suite 620

Salem, OR 97301

503-373-1573

info@obce.oregon.gov

www.oregon.gov/obce



*****CONFIDENTIALITY NOTICE*****

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Thomas D. Freedland, D.C.

8196 S.W. Hall Blvd
Suite 306
Beaverton, Oregon 97008
(503) 684-1273

February 28, 2022

Cass McLeod-Skinner
Executive Director
Oregon Board of Chiropractic Examiners
530 Center St NE, Suite 620
Salem, OR 97301

Dear Director McLeod-Skinner and Members of the Board:

I am pleased that you are undertaking a review and update of the Guide to Policy and Practice. I would like to be part of this process. I was privileged to be part of the Nominal Committee that developed the Educational Manual for Evidence Based Chiropractic. As such, I am familiar with the committee approach to developing practice guidelines and recommendations.

I am currently on the Board's Peer Review Committee and previously served on the committee a little over 10 years ago. I have taught within the curriculum at University of Western States and Cleveland Chiropractic College – Los Angeles. For the last 10 years I have been teaching a continuing education class for doctors in California, Arizona, Nevada, Washington, and Oregon on the topics of Clinical Documentation, Physical Examination, Ethics, HIPAA, and Cybersecurity. These were in-person classes prior to the pandemic; for the last 2 years the presentation has been via Zoom.

After more than 30 years, I am still in active practice, and I am often asked to consult on medical-legal cases, including review of clinical records and second opinion or independent evaluations.

I have provided you with a copy of my CV. I hope you will consider allowing me to be a part of this new committee.

Respectfully,



Thomas D. Freedland, D.C.
TDF:

Curriculum Vitae:

Eric C. Hubbs, DC, FCBP, CCST, CIA

President, Brain Injury Alliance of OR from 2015-2019

Currently serving as Treasurer

Board Member, Oregon Chiropractic Association From 2015-2021

Served as President from 2019-2021

State Representative, International Chiropractors Association Since 2012

State Representative, Palmer College of Chiropractic Alumni Association since 2016

Current Practice location:

180° Chiropractic

14685 SW Millikan Way

Beaverton, OR 97003 (503)644-2278

Previous Office locations:

Total Mind & Body Health

4905 SW Griffith Drive

Suite 100

Beaverton, OR 97005 (503)591-5022

Advanced Chiropractics

17955 SW Tualatin Valley Hwy.

Aloha, OR 97007 (503)591-5022

August, 2001 – April, 2013

3800 SW Cedar Hills Blvd.

Suite 230

Beaverton, OR 97005 (503) 644-4880

August, 1998 – July, 2001

Cedar Hills Chiropractics

4270 SW Cedar Hills Blvd. Beaverton, OR 97005

(503) 526-3880

September, 1995 - August, 1998

United Chiropractic

9130 Taylorsville Road Louisville, KY 40299 (502) 491-0627

May, 1986 – August, 1995

EDUCATION

1975 – 6 Study Abroad Program, Microbiology and related courses.
Albert-Ludwigs Universitaet, Freiburg, Germany

1977 BSc Zool/Microbiology University of Michigan, Ann Arbor, MI Graduate, Honors College

1977-79 Graduate School, School of Public Health majoring in Epidemiology and Public Health
University of Michigan, Ann Arbor, MI

1985 Doctor of Chiropractic, magna cum laude, Palmer College of Chiropractic, Davenport, IA

TEACHING

1975 Symposium, “Polysaccharid Antigene, Biologie und Chemie”
Albert Ludwigs Universitaet, Freiburg, Germany

1980 “Nutrition for the Dental Assistant”
Guest Lecture for Plymouth Vocational Education Center, Plymouth MI

1983 –4 Tutor in Biochemistry, Palmer College of Chiropractic, Davenport, IA

1984 Substitute lecturer in Pathology, Palmer College of Chiropractic, Davenport, IA

1984 Student Teacher in Technique, Palmer College of Chiropractic, Davenport, IA

2002 Assistant instructor of Chiropractic Biophysics, Costa Mesa, CA

2010 – 13 Teaching Assistant University of Western States College of
Chiropractic Department of Chiropractic Sciences, Portland, OR

2015 Brain Injury Alliance of OR annual Conference: “Nutritional Approaches to
Nerve Damage—managing the glutamate cascade.”(1.5 hours)

2017 Brain Injury Alliance of OR annual Conference: “Alar ligament damage and headache
In Traumatic Brain Injured patients” (2 hours)

2020 and 2021 Brain Injury Alliance of OR annual Conference: “Successful management of
Cervical Dystocia in a Brain-injured patient” (1.5 hours)

FOREIGN LANGUAGES

Fluent: German, French

Medical and conversational facility: Spanish

Conversational rudiments: Portuguese

PROFESSIONAL EXPERIENCE

1977-79 Nutritional Consultant, Ann Arbor, MI

1979-81 Microbiologist, VA Medical Center, Ann Arbor, MI

1986-95 Private Practice of Chiropractic, Louisville, KY

1995 - Private Practice of Chiropractic, Portland area, OR

SIGNIFICANT POST GRADUATE EDUCATION

1985 Laboratory Nutrition - R.V. Chalam, PhD 12 hours

Scoliosis – Fred Barge, DC 12 hours

Externship Palmer Upper Cervical Specific Technique

Externship Grostic Upper Cervical Technique

1990-1992 Technical Certainty – C. J. Mertz, DC 48 hours Minor Surgery – Western States Chiropractic College 3 hours Review of Proctology – Western States Chiropractic College 3 hours

1995 Review of Ob/Gyn – Western States Chiropractic College 3 hours

1998 – 2003 Chiropractic Biophysics – Don Harrison, DC 210 hours

PROFESSIONAL LICENSES AND CERTIFICATES

1984 Certificate, National Board of Chiropractic Examiners

1984 Certificate of proficiency, SOT (low force/non force) Certificate of Merit, Chiropractic research License, Kentucky Board of Chiropractic Examiners

License, Oregon Board of Chiropractic Examiners

2003 Certification: Distinguished Fellow - Chiropractic Biophysics

2005 - 2006 120 hour Certification in the Treatment of Spinal Trauma

2009 Certification in Impulse Instrument Adjusting

2017 – 2020 Postgraduate Neurodiagnostic fundamentals

Oregon Chiropractic Association Continuing Education – Glen Zielinski, DC DACNB Instructor

GILKER Heather * BCE

From: Eric Hubbs <[REDACTED]>
Sent: Monday, February 28, 2022 5:58 PM
To: OBCE Oregon * BCE
Subject: Re: [OBCE_Publication] REMINDER: OBCE - P&P Committee Opportunity

Can I be on that committee?

Sent from my iPhone
Eric

On Feb 28, 2022, at 10:46 AM, OBCE Oregon * BCE <info@obce.oregon.gov> wrote:

This message is being sent to all licensees and certificate holders.

Reminder

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- Cosmetology
- Energy Medicine Devices
- Biofeedback
- Soundwave Therapy
- Magnetic Therapy
- Breast Thermography
- Dark Field Microscopy
- Minor Surgery
- Low Level Light Therapy
- Hyperbaric Oxygen Therapy and Concentrated Oxygen
- IMEs
- Primary Care/Portal of Entry
- Death Certificates
- DOT/CTL Examinations
- Substances and Supplements
- Auriculotherapy

The P & P Committee is an advisory committee and will make recommendations to the Board as to possible revisions to the P & P. These recommendations will then be reviewed by the Board for possible further action and adoption.

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Oregon Board of Chiropractic Examiners
530 Center St NE, Suite 620
Salem, OR 97301
503-373-1573
info@obce.oregon.gov
www.oregon.gov/obce



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GILKER Heather * BCE

From: [REDACTED]
Sent: Monday, February 28, 2022 6:05 PM
To: OBCE Oregon * BCE
Subject: Committee service
Attachments: Curriculum Vitae Hubbs 2022.pdf

Dear OBCE:

I would love to serve on your P&P committee. My interest stems from the desire to make sure that Chiropractic care in this state remains at the highest degree of professionalism.

Enclosed find my CV.

Sincerely,

Eric C. Hubbs, DC, CCST

GILKER Heather * BCE

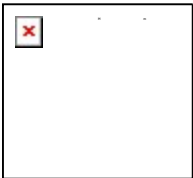
From: Lisa Kouzes DC [REDACTED]
Sent: Thursday, February 10, 2022 1:07 PM
To: OBCE Oregon * BCE
Subject: P&P Committee
Attachments: LKouzes CV February 2022.pdf

Hi,
Please let this email serve as my cover letter. My resume is attached.

I would like to be considered for the P&P Committee because I enjoy working with the OBCE, and I am committed to patient safety and the quality of chiropractic practice. I feel I have related experience that may serve valuable to the committee.

Thank you for your consideration,
Lisa Kouzes, DC

Lisa Kouzes, DC



In the office of Balance NW
4690 SW Hall Blvd. Ste. 110
Beaverton, OR 97005
[503-972-5601](tel:503-972-5601)

CONFIDENTIALITY NOTICE

THIS E-MAIL, INCLUDING ANY ATTACHED FILES, MAY CONTAIN CONFIDENTIAL AND PRIVILEGED INFORMATION FOR THE SOLE USE OF THE INTENDED RECIPIENT(S). ANY REVIEW, USE, DISTRIBUTION, OR DISCLOSURE BY OTHERS IS STRICTLY PROHIBITED. IF YOU ARE NOT THE INTENDED RECIPIENT (OR AUTHORIZED TO RECEIVE INFORMATION FOR THIS RECIPIENT), PLEASE CONTACT THE SENDER BY REPLY E-MAIL AND REMOVE ALL COPIES OF THIS MESSAGE. THANK YOU.



Lisa A. L. Kouzes, DC
4690 SW Hall Blvd. Ste. 110
Beaverton, OR 97005
P (503) 972-5601
F (503) 972-5603

Curriculum Vitae

Education

- Second year Master of Public Health (MPH) part-time student at Oregon Health Sciences University and Portland State University School of Public Health (OHSU/PSU SPH)
- Doctor of Chiropractic (DC) from the University of Western States, College of Chiropractic, 2007, summa cum laude, class valedictorian
- Bachelor of Science (BS) in Molecular, Cellular, and Developmental Biology from the University of California at Santa Cruz, 2002, magna cum laude, highest honors in the major

State Licenses

- Oregon Board of Chiropractic Examiners (2007 to present) License # 3727
- Washington State Department of Health (2010 to present) License # CH 60093960
- Arizona Board of Chiropractic Examiners (2011 to 2012) License # 8163

Private Practice

I opened my private practice in Tigard, Oregon in January 2008. As my practice grew, I founded AllPoints Integrative Health, LLC in Portland, Oregon in June 2012 and moved to a new location in Beaverton, Oregon after the birth of my second child in 2018. The tag line for AllPoints Integrative Health, LLC is *Combining East and West* to inspire partnership across all health providers involved in a patient's care. I communicate regularly with patients' primary care physicians. I continue to treat patients on a regular basis and have adopted a reduced practice volume in response to the COVID-19 pandemic.

I treat a range of musculoskeletal injuries and conditions of the spine, extremities, and jaw; and I often incorporate nutrition, exercise, and lifestyle advice. I focus primarily on manual adjustments in conjunction with soft tissue techniques such as trigger point therapy and pin and stretch. I also incorporate drop table, SOT blocks, Activator tool adjustments, and physical therapy modalities as indicated. My patients are made up of children, pregnant women, and mostly adults of all ages.



Lisa A. L. Kouzes, DC
4690 SW Hall Blvd. Ste. 110
Beaverton, OR 97005
P (503) 972-5601
F (503) 972-5603

Employment

The CHP Group (CHP) in Beaverton, Oregon

CHP is a preferred provider organization and third-party administrator that maintains a network of chiropractic physicians, naturopathic physicians, acupuncturists, and massage therapists.

Regional Medical Director (February 2020 – present)

- Clinical Quality Management (QM) Programs:
 - Develops and implements strategies designed to improve the quality and efficiency of services provided by contracted providers.
 - Advocates for the delivery of quality and cost-effective care to covered populations.
 - Assists with development and management of clinical pathways, advisories, Clinical Quality Improvement Initiatives (CQII), Chronic Condition Programs, and other components of the Company's QM programs.
- Provider Relations:
 - Assists the investigation and resolution of member and provider complaints concerning clinical, administrative, quality of care, and utilization issues.
 - Assists in network recruitment and development activities to create an effective distribution of providers.
- Credentialing:
 - Serves as Chair of Credentialing Committee
 - Participates in the development of standards for provider credentialing to assure compliance with external regulations and health plan delegation.
- Utilization Management (UM) Programs:
 - Participates with internal and external staff, medical directors, and clinician advisors in UM policy and program maintenance, development, and implementation.

University of Western States in Portland, Oregon

- Attending Physician Relief at the senior clinics, supervising and facilitating interns' evaluation and management of patients from the public (2007-2011)
- Assistant Clinician at the senior clinics, supervising and facilitating interns' evaluation and management of patients from the public (2007)
- Lab Instructor at the junior clinic, evaluating interns' history and physical examination skills (2007-2008)
- Chiropractic Technique Lab Teaching Assistant, teaching and evaluating students' physical evaluation and treatment skills (2007-2009)



Lisa A. L. Kouzes, DC
4690 SW Hall Blvd. Ste. 110
Beaverton, OR 97005
P (503) 972-5601
F (503) 972-5603

Oregon Health Authority Experience

Health Evidence Review Commission (HERC)

- Member of the Evidence-based Guidelines Subcommittee (EbSG) (November 2021 – present)

Regulatory Board Experience

Oregon Board of Chiropractic Examiners (OBCE)

- Member of the Guide to Policy and Practice Workgroup (2021)
- Board Member (terms June 2013 – May 2016 & June 2016 – May 2019)
 - Secretary (2015-2018)
 - Continuing Education Czar (2014-2019)
 - Liaison to the Examinations, Tests, Substances, Devices & Procedures (ETSDP) Committee (2014-2015)
- Member of the Administrative Rules Advisory Committee (2010-2013)
- Member of the Ethics and Jurisprudence Exam Workgroup (2009 and 2019)

Consulting Experience

I have performed independent medical evaluations, record reviews, and medico-legal consultations including trial testimony involving personal injury and malpractice cases beginning in 2008 to present. I have performed panel evaluations with a varied of specialists such as naturopathic physicians, acupuncturists, neurologists, neurosurgeons, anesthesiologists, orthopedic surgeons, internists, family physicians, and neuropsychologists.

In my final term as a senior intern at the University of Western States in 2007, I was chosen to represent the chiropractic profession as a member on the Complementary and Alternative Medicine panel at the Center for Women's Health at OHSU for patient consultations.



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Societal Memberships

Federation of Chiropractic Licensing Boards (FCLB)

The FCLB is an association of chiropractic regulatory boards of the states, provinces, commonwealths, or territories of the United States of America, Canada, Australia, and other countries.

- District I Director – (term 2021-2023)
- Chair of the Policies and Procedures Committee (July 2021 – present)
- Alternate District I Director – (term 2017-2020, extended to 2021 due to COVID-19)
- Member
 - COVID-19 Committee (2020)
 - Policy and Procedures Committee (2020-present)
- Honorary Fellow (2019 to present)
- Fellow (2013-2019)

American Chiropractic Association (ACA)

- Member (2019 to present)

American Public Health Association (APHA)

- Member (2019 to present)
 - Chiropractic Health Care
 - Integrative, Complimentary, and Traditional Health Practices
 - Health Administration

Oregon Public Health Association (OPHA)

- Member (2020 to present)



Nationwide Network of DOT Medical Examiners

***Michael Megehee, DC, President
509 SW Frazer Ave. Pendleton, OR 97801
Phone: 541-276-6032 Fax: 541-276-7062
www.TeamCME.com***

February 3, 2022

Oregon Board of Chiropractic Examiners
530 Center St NE, Suite 620
Salem, OR 97301

Re: Policy and Practice Committee Application

Dear OBCE Members,

Please find attached my application for an appointment to the Policy and Practice Committee. I have been in practice in Oregon from 1991 and continue to have an active Senior Doctor of Chiropractic License.

Please contact me should you have any questions.

Respectfully,

A black rectangular box redacting the signature of Michael John Megehee, DC. Below the box, a faint, handwritten signature is visible.

**Michael John Megehee, DC
President**

TeamCME

National Network of DOT Medical Examiners



Michael Megehee, DC, FMCSA National Registry Certified Medical Examiner, TeamCME President

Dr. Megehee was appointed by the Federal Motor Carrier Safety Administration (FMCSA) in 2005 as a member of the National Registry of Certified Medical Examiner (NRCME) Brainstorming Sessions. He was appointed as a Subject Matter Expert/ Member of the National Registry Working Integrated Product Team (WIPT) that developed the Survey instrument used to establish the basis for NRCME certification. He was subsequently appointed to the National Registry Education Team that developed the core curriculum for the accredited physician training and he assisted the National Registry Test Team to develop and write test questions for the National Registry Certification Test. He is currently a FMCSA National Registry "Champion". Dr. Megehee is an unofficial contact with the Federal Aviation Administration regarding the FAA BasicMed program for private pilots and the State Chiropractic Licensing Boards and chiropractic profession.

Dr. Megehee is a past featured speaker/instructor with the Owner Operator Independent Driver Association Driver (OOIDA) Education series and assists OOIDA with their members' medical exam concerns. He is a nationally published author and radio show guest and has traveled the U.S. training physicians regarding the DOT physical exam. He was the first Doctor of Chiropractic to be designated as a Walmart Distribution Center Medical Examiner to perform CDL physicals for Walmart drivers.

Dr. Megehee served as Vice President of the American Chiropractic Association Council on Occupational Health. He is a Post-Graduate Faculty member of the University of Western States, a Master Lifeloc Breath Alcohol Technician Trainer, and a past DATIA Certified Professional Collector Trainer having completed DATIA Advanced Drug Testing Management training. Dr. Megehee completed AAMRO's Medical Review Officer, Alcohol & Drug Testing, and Substance Abuse Evaluation training. He is a past Secretary/Member of the Oregon Board of Chiropractic Examiners, Alternate Delegate to the National Board of Chiropractic Examiners and Delegate to the Federation of Chiropractic Licensing Boards. He is past Vice President of the Safe Drivers, Safe Roads Coalition, a nonprofit organization.

Dr. Megehee founded TeamCME in 2010. As President of the nation's largest provider network of National Registry Certified Medical Examiners, he is the expert resource to over 750 TeamCME member clinics. TeamCME is a FMCSA Accredited National Registry Training Organization having provided the NRCME accredited physician training to thousands of Medical Examiners. TeamCME provides advanced medical examiner training to its members and is the only nationally recognized CME network as an OOIDA partner in providing fair, ethical Driver Helpful® DOT physical exams nationwide. TeamCME is the national distributor of SensiCardiac computerized heart auscultation for DOT physicals and the Chiropractic profession. TeamCME is the exclusive provider network for Stone Three's TruckerHearts campaign to "Save" trucker's hearts.

GILKER Heather * BCE

From: Michael Megehee <[REDACTED]>
Sent: Thursday, February 03, 2022 12:13 PM
To: OBCE Oregon * BCE
Subject: OBCE Policy and Practice Workgroup Appointment
Attachments: Current Vitae Mike 1 page.docx; 2022 OBCE Policy and Practice Workgroup Application.doc

Please find attached a letter of interest and resume regarding my request for appointment to the Policy and Practice Workgroup.

Thank you,
Michael John Megehee, DC, NRCME
TeamCME Founder/President

Sent from [Mail](#) for Windows



This email has been checked for viruses by Avast antivirus software.
www.avast.com

GILKER Heather * BCE

From: MCLEOD-SKINNER Cass * BCE
Sent: Tuesday, February 15, 2022 3:16 PM
To: GILKER Heather * BCE
Cc: PURNELL Mackenzie G * BCE; MCLEOD-SKINNER Cass * BCE
Subject: FW: OBCE Panel
Attachments: WM_Moreau_CV_Feb_2022.doc

P&P Committee applicant.

From: Bill Moreau [REDACTED] >
Sent: Tuesday, February 15, 2022 3:08 PM
To: MCLEOD-SKINNER Cass * BCE <Cass.MCLEOD-SKINNER@obce.oregon.gov>
Cc: Jaci Bergstrom <[REDACTED]>; Joseph Brimhall [REDACTED]
Subject: RE: OBCE Panel

Please consider me as an interested OBCE licensee panelist regarding the OBCE discussions on the scope of practice for Oregon doctors of chiropractic.

I am interested in helping to further define scope of practice for Doctor of Chiropractic in the state of Oregon with the intent of also protecting the citizens that they serve.

My curriculum vitae is attached for your review.

Additionally, my colleague Dr. Bergstrom has also expressed interest in supporting this important project.

Thank you for your considerations. Please let me know how the University and the clinicians can support the OBCE.

Bill Moreau, DC, DACBSP, FACSM

Chief Medical Officer

University of Western States

8000 NE Tillamook Street, Portland, Oregon 97213

503-847-2580 | [REDACTED]

CONFIDENTIAL COMMUNICATION: The information contained in this email or attachments therein is confidential and is intended only for the use of the individual(s) identified above and others who specifically have been authorized to receive it. If the reader of this message is not the intended recipient, or the employee or agent responsible to deliver it to the intended recipient, you are hereby notified that reading, use, dissemination, distribution or copying of this email is strictly prohibited. If you have received this communication in error, please delete it and any attachments and contact [REDACTED]

WILLIAM J. MOREAU, D.C., DACBSP®, FACSM

Business Address: 8000 NE Tillamook St, Portland OR 97213

Phone: [REDACTED]

Email: [REDACTED]

Professional Status:

University of Western States – Chief Medical Officer 2019 to present
United States Olympic Committee, Sports Medicine 2009 - 2019
United States Olympic Committee – Vice President Sports Medicine Division 2017 to 2019
Co-Chair: Summit on Sexual Abuse in Sport; Building Action Plans for Sports Medicine Providers. Pittsburgh, PA. November 2019
Pan American Sports Organization (PASO) 2018-19 Medical Commission
United States Olympic Committee – Pyeongchang Winter Games Chief Medical Officer 2018
University of Colorado, School of Medicine – Clinical Instructor 2017 to present
United States Olympic Committee – Vice President Sports Medicine Division 2017 to 2019
Founded the United States Coalition for the Prevention of Illness and Injury in Sport 2017
United States Olympic Committee – Rio Olympic Summer Games Chief Medical Officer 2016
United States Olympic Committee – Toronto Pan American Games Chief Medical Officer 2015
Professor Southern California University of Health Sciences 2015 – present
Associate Professor University of Western States 2015 - present
NFL International Think Tank on Concussion 2014 - 2018
International Olympic Committee Advanced Team Physician Course, 2018, 2016, 2014, 2011
United States Olympic Committee – Medical Director Sochi Games 2013
American College of Sports Medicine – International Relations Committee 2013 to 2019
American College of Sports Medicine – Olympic and Paralympic Sports Medicine and Sport Science Committee 2013 to 2019
Founded Fortis Cura, Inc. – MSK EBM Healthcare Company 2012
United States Olympic Committee – Medical Director London Games 2012
United States Olympic Committee – Managing Director of Sports Medicine Division 2012 to 2017
International Olympic Committee Advanced Team Physician, 2011
United States Olympic Committee – Director of Sports Medicine Clinics: Colorado Springs CO, Lake Placid NY, Chula Vista CA 2011
2011 Pan American Games Puerto Vallarta Venue Medical Director
United States Olympic Training Centers – Sports Medicine Clinics Manager: Colorado Springs CO, Lake Placid NY, Chula Vista CA 2009 to 2010
Vice-Chancellor Palmer College of Chiropractic 2008
Fortus Cura Founder 2008

Director of Moreau Chiropractic Clinic, P.C. 1981 to 2008
 Founder of distance-based education platform - DConline™ 2001 to present
 Licensed to practice Chiropractic, California, Colorado, Iowa and New York
 Board Certification as a Diplomate of American Chiropractic Board Sports
 Physicians, Diploma #8, 1994 to present
 Board Certification as a Certified Chiropractic Sports Physician,
 Certificate #1063, August 1990
 American Chiropractic Board of Sports Physicians BOD/Advisor 1994 to present
 Palmer Chiropractic College Sports Chiropractic Education Coordinator 2001-
 present
 Palmer College of Chiropractic Postgraduate faculty, 1991 to present
 Southern California University of Health Sciences Postgraduate Faculty, 1993 to
 present
 Western States Chiropractic College Postgraduate Faculty 2002 to present
 Northwestern Health Sciences University Postgraduate Instructor 1990 to 2007
 Life Chiropractic College - Postgraduate Instructor 2007
 Parker Chiropractic College Postgraduate Instructor 2006 to 2017
 Logan College of Chiropractic, Postgraduate Faculty 1993 to 1994
 Northwestern Health Sciences University Postgraduate Coordinator - Sports
 Chiropractic Education 1999 to 2002
 American Chiropractic Board of Sports Physicians – Committee chair for
 position stands 2004 to 2008
 Chiropractic Guidelines and Practice Parameters – Committee Member and
 Researcher 2004 to 2008
 Council on Chiropractic Education (CCE) Graduate and Specialty Education
 Committee 2000 to 2005
 Fellow of the International College of Chiropractors, 1995 to present
 Editorial Review Board *Journal of Chiropractic Medicine* 2007 to 2014
 Associate Editor *Journal of Sports Chiropractic and Rehabilitation* 1999 to 2002
 Associate Editor, *Chiropractic Sports Medicine* 1995 to 1999
 FICS - Federation of International Chiropractic Sports – Education
 Chairperson 1993 to 1995
 Liaison to the Iowa High School Athletic Association for the Iowa
 Chiropractic Society 1994 to 2007
 Chairperson - American Chiropractic Board of Sports Physicians "Campaign of
 Champions" 2003 to 2006
 President's Club Southern California University of Health Sciences 2010 to
 present
 President's Club University of Western States 2010 to present
 President's Club Palmer College of Chiropractic 2003 to present
 Foundation for Chiropractic Education and Research - Presidents Council 2006 to
 2008

Education:

The University of Utah School of Medicine Health Science Leadership
 Development Program. 2017
 Kellogg School of Business; Chicago, Illinois 2010-2011

Northwestern Health Sciences University; Bloomington, Minnesota. Postgraduate coursework - Diplomate of the American Chiropractic Board of Sports Physicians, 1990-1993

Northwestern Health Sciences University; Bloomington, Minnesota.

Postgraduate coursework - Certified Chiropractic Sports Physician 1989-1990

Palmer College of Chiropractic; Davenport, Iowa 1979-1981

South Dakota State University; Brookings, South Dakota 1977-1978

Iowa State University; Ames, Iowa 1976-1977

Estherville Community Schools; Estherville, Iowa 1963-1976

International Olympic Committee Related Courses:

2018 IOC Advanced Team Physician Course: Marrakech, Morocco.

2016 IOC Advanced Team Physician Course: Cape Town, South Africa

2016 5th International Consensus Conference on Concussion in Sport. 27-28 October

2016. Berlin, Germany (Concussion Consensus Meeting)

2015 IOC Advanced Team Physician Course: Doha, Qatar

2014 IOC Advanced Team Physician Course: Mandelieu, France

2011 IOC Advanced Team Physician Course: Calvi, Corsica

ACSM Related Activities:

Twenty plus years of continuous professional membership since April 1995

ACSM Conferences:

2018 ACSM Annual Meeting

2017 ACSM Annual Meeting

2016 ACSM Annual Meeting

2015 ACSM Annual Meeting

2014 ACSM Annual Meeting

2013 ACSM Annual Meeting and World Congress on Exercise is Medicine

2012 ACSM Annual Meeting and World Congress on Exercise is Medicine

2011 ACSM Annual Meeting and World Congress on Exercise is Medicine

2010 Intro to Musculoskeletal Ultrasound Post-Conference

ACSM Presentations:

2017 Annual Meeting and World Congress on Exercise is Medicine, RIO 2016 Olympic and Paralympic Sports Medicine Strategies and Lessons Learned for TOKYO. Moreau B, Bluawet C, Wilbur R, Simpson J, and Coan M.

2015 Annual Meeting, World Congress on Exercise is Medicine and World Congress on the Role of the Basic Science of Exercise Fatigue. Session Title: Inside the Games: Unique Issues in Olympic and Paralympic Sport (Olympic/Paralympic Committee)

Presentation Title: Use of Electronic Medical Record Systems to Facilitate Sports Medicine and Sport Science Research. Moreau B.

2013 ACSM Annual Meeting and World Congress on Exercise is Medicine, Manual Medicine Approaches to the Sports Medicine Patient. Ballantine S and Moreau B. Indianapolis IN

2013 ACSM Annual Meeting and World Congress on Exercise is Medicine, Manual Techniques of the Lumbar Spine and Sacroiliac Joint. Ballantine S and Moreau B. Indianapolis IN

2012 ACSM Annual Meeting and World Congress on Exercise is Medicine, The Role of Manual Therapy in Olympic Sports Medicine. Moreau B and Nabhan D. San Francisco CA

2011 ACSM Annual Meeting and World Congress on Exercise is Medicine, Role of Sports Science and Sports Medicine in the Success of Team USA at the Vancouver Winter Olympics. Wilbur R, Moreau B, Reiwalt S. Denver CO

Publications:

Moreau W., & Crockett S. (2021, June) *We Floss Our Teeth, So Why Not Floss Our Nerves?* Tennessee Chiropractic Association Journal. 40(1) 9-10.

Moreau W., Nabhan D., Khodaei M., Waterbrook A. L., & Gammons M. *Sports-related Fractures, Dislocations and Trauma: Advanced On- and Off-field Management*. Springer International Publishing 2020. doi:10.1007/978-3-030-36790-9

Zdziarski L., Pierpoint L., Taylor D., Donaldson A., Moreau W., & Nabhan D. *193 Normative Baseline SCAT5 Scores in a Population of United States Paralympic Athletes*. British Journal of Sports Medicine Mar 2020, 54 (Suppl 1) A81; DOI: 10.1136/bjsports-2020-IOCAbstracts.193.

Pierpoint L., Zdziarski L., Taylor D., Moreau W., & Nabhan D. (2020, May). *189 Normative Baseline SCAT5 scores in a Population of United States Olympic athletes*. British Journal of Sports Medicine Mar 2020, 54 (Suppl 1) A79-A80; DOI: 10.1136/bjsports-2020-IOCAbstracts.189.

Clarsen B., Bahr R., Myklebust G., Andersson S. H., Docking S. I., Drew M., Finch C. F., Fortington L. V., Harøy J., Khan K. M., Moreau W., Moore I. S., Møller M., Nabhan D., Nielsen R. O., Pasanen K., Schwellnus M., Soligard T., & Verhagen E. (2020, April). *Improved reporting of overuse injuries and health problems in sport: An update of the Oslo Sport Trauma Research Center questionnaires*. British Journal of Sports Medicine, 54(7), 390–396.

Nabhan D., Windt J., Taylor D., & Moreau W. (August, 2019). *Close Encounters of the US Kind: Illness and Injury Among US Athletes at the PyeongChang 2018 Winter Olympic Games*. Br J Sports Med 2019;0:1–7. doi:10.1136/bjsports-2018-100015.

Nabhan D., Schumacher Y., Moreau B., Bielko S., Bahr R., & Sinex J. (2019, July). *Serum ferritin distribution in elite athletes*. (Under final review) Journal of Science and Medicine in Sport.

Moreau W., Holder T., & Nabhan D. (2019, May). *Survey of Income Comparison: General Practice and Sports Certified Doctors of Chiropractic*. Journal of Chiropractic Medicine. 18(1), 42–47.

Wilkerson G., Nabhan D., Prusmack C., & Moreau W. (2018, April). *Detection of Persisting Concussion Effects on Neuromechanical Responsiveness*. Medicine & Science in Sports & Exercise, Publish Ahead of Print DOI: 10.1249/MSS.0000000000001647

Chapman R., Sinex J., Wilber R., Kendig A., Moreau W., Nabhan D., & Stray-Gundersen J. (2017, November). *Routine Screening for Iron Deficiency Is an Important Component of Athlete Care*. Med Sci Sports Exerc. 2017, 49 (11): 2364; DOI: 10.1249/MSS.0000000000001358

Moreau W. (2017, July). *The Role of Doctors of Chiropractic in the Management of Sports Related Concussion. Knowing What You Need to Know About SRC Before You Need to Know It!* Tennessee Chiropractic Association Journal.

Moreau W., Walden T. & Nabhan D. (2017, June). *Defining the elite: normative values for SCAT major components in healthy elite athletes*. Br J Sports Med 2017, 51 (11) A74; DOI: 10.1136/bjsports-2016-097270.192.

Moreau W., Walden T. & Nabhan D. (2017, June). *Defining the Paralympic athlete: normative values for scat major components in healthy Paralympic athletes*. Br J Sports Med 2017, 51 (11) A74-A75; DOI: 10.1136/bjsports-2016-097270.193.

Nabhan D., Walden T. & Moreau W. (2017, June). *Concussed Elite Athletes Have Better Tandem Gait Performance*. Br J Sports Med 2017; 51: A39.

Moreau W., Walden T. & Nabhan D. (2016, October). *Defining the elite: normative values for SCAT major components in healthy elite athletes*. Poster presented at the 5th International Consensus Conference on Concussion, Berlin, Germany.

Moreau W., Walden T. & Nabhan D. (2016, October). *Defining the Paralympic athlete: normative values for scat major components in healthy Paralympic athletes*. Poster presented at the 5th International Consensus Conference on Concussion, Berlin, Germany.

Nabhan D., Walden T. & Moreau W. (2016, October). *Concussed elite athletes have better tandem gait performance*. Poster presented at the 5th International Consensus Conference on Concussion, Berlin, Germany.

Nabhan D., Moreau W., McNamara S., Briggs K. & Philippon M. (2016, September/October). *Subspine Hip Impingement: An Unusual Cause of Hip Pain in an Elite Weightlifter*. Current Sports Medicine Reports September/October 2016 Vol. 15 - Issue 5: p 315–319.

Siedlik J., Bergeron C., Cooper M., Emmons R., Moreau W. & Nabhan, D. et al. (2016). *Advanced Treatment Monitoring for Olympic-Level Athletes Using Unsupervised Modeling Techniques*. Journal of Athletic Training, 51(1), 74–81.

Nabhan D., Walden T., Street J., Linden H. & Moreau W. (2015). *Sports injury and illness epidemiology during the 2014 Youth Olympic Games: United States Olympic Team Surveillance*. Br J Sports Med 2016;bjsports – 2015–095835.

- Moreau W., Nabhan D. & Walden T. (2015). *Sport Concussion Knowledge and Clinical Practices: A Survey of Doctors of Chiropractic With Sports Certification*. Journal of Chiropractic Medicine n.d.;0(0). Doi: 10.1016/j.jcm.2015.08.003.
- Moreau W., Nabhan D. & Roecker C. (2015). *The American Chiropractic Board of Sports Physicians Position Statement on Pre-participation Examinations: An Expert Consensus*. Journal of Chiropractic Medicine. n.d.;0(0). Doi: 10.1016/j.jcm.2015.08.004.
- Nabhan D., Moreau W. & Barylski C. (2015). *Laboratory Tests Ordered By a Chiropractic Sports Physician on Elite Athletes Over a 1-Year Period*. Journal of Chiropractic Medicine 2015;14(2):68–76. Doi: 10.1016/j.jcm.2015.04.001.
- De Luigi Arthur J., Nabhan D. & Moreau W. (2014). *Early sonographic detection of a talar dome osteochondral defect in a female wrestler*. Curr Sports Med Rep 2014;13(3):169–71. Doi: 10.1249/JSR.0000000000000051.
- Moreau W. & Nabhan D. (2013). *Development of the 2012 American Chiropractic Board of Sports Physicians position statement on concussion in athletics*. J Chiropr Med 2013;12(4):269–73. Doi: 10.1016/j.jcm.2013.07.002.
- Johnson C., Green B., Nelson R., Moreau W. & Nabhan D. (2013). *Chiropractic and Concussion in Sport: a Narrative Review of the Literature*. J Chiropr Med. 2013; 12(4) 216-229.
- Johnson C., Green B., Nelson R., Moreau W. & Nabhan D. (2012). *Chiropractic Management of Concussion in Sport: A Literature Review and Review of Current Guidelines*. Presented at the 2012 American Public Health Association Annual Meeting.
- Moreau W. & Nabhan D. (2012). *Organization and Multiple Disciplinary Work in an Olympic High Performance Centers in USA*. Rev. Med. Clin. Condes - 2012; 23(3) 337-342.
- Moreau W. & Toohey P. (2012). *The importance of Communication: Understanding the Importance of the Event to the Athlete, Coach and Others*. In James Zachazewski and David Magee, (Eds). International Olympic Committee - Sports Therapy.
- Nabhan D., Guimard B., Street J. & Moreau W. (2012, April). *Self-reporting of sports medicine services by doctors of chiropractic at United States Olympic Training Centers*. Presented at the American Chiropractic Board of Sports Physician's™ 2012 Sports Science Symposium. **Robert Reed Award for Best Abstract**.
- Guimard B., Nabhan D., Moreau W. & Street J. (2012, April). *Most commonly treated areas of chief complaint by sports medicine chiropractors for elite athletes in a multidisciplinary healthcare clinic*. Presented at the American Chiropractic Board of Sports Physician's™ 2012 Sports Science Symposium. **John Nash Award for Best Multidisciplinary Abstract**
- Guimard B., Moreau W. & Quincy R. (2012, April). *Multidisciplinary Management of an Ankle Injury with Persistent Ankle Dysfunction in an Elite Level Track Athlete: A Case Study*. Presented at the American Chiropractic Board of Sports Physician's™ 2012 Sports Science Symposium. **John N Nash Award for Best Multidisciplinary Abstract**

Moreau W. & Nabhan D. (2011). *Position Statement on Concussion in Athletics*. American Chiropractic Board of Sports Physicians™.

Nabhan D. & Moreau W. (2011, April). *Utilization of Diagnostic Imaging by Doctors of Chiropractic in an Elite Sports Medicine Clinic*. Presented at the American Chiropractic Board of Sports Physician's™ 2011 Sports Science Symposium.

Nabhan D. & Moreau W. (2011, April). *Progressive Loading in the Rehabilitation of Lower Extremity Bony Stress Injury in Elite Runners*. Presented at the American Chiropractic Board of Sports Physician's™ 2011 Sports Science Symposium.

Hatch S. & Moreau W. (2011, April). *Healthcare Provider's Perspectives Regarding the Usefulness of Orthopedic Tests*. Poster presented at the American Chiropractic Board of Sports Physician's™ 2011 Sports Science Symposium.

Moreau W., Conway K., Street J. & Nabhan D. (2010, April). *Selections of Sports Medicine Services by Athletes at Olympic Training Centers*. Presented at the American Chiropractic Board of Sports Physician's™ 2010 Sports Science. **Robert Reed Award for Best Abstract**

Barylski C., Takahashi R., Crawley J. & Moreau W. (2010, April). *Lower Leg Pain in an Elite Level Triathlete: A Case Study*. Presented at the American Chiropractic Board of Sports Physician's™ 2010 Sports Science Symposium. **John N Nash Award for Best Multidisciplinary Abstract**

Nabhan D. & Moreau W. (2010, April). *The Use of Musculoskeletal Ultrasonography in the Diagnosis of Tendinopathy in a Multidisciplinary Sports Medicine Clinic*. Poster presented at the American Chiropractic Board of Sports Physician's™ 2010 Sports Science Symposium.

Moreau W. (2009, June). *Building a Team of Champions*. Journal of Chiropractic Medicine Volume 8, Issue 2, June 2009, Pages 49-50.

Green B., Johnson C. & Moreau W. (2009, May). *Scoliosis and sports participation: A systematic review of the literature*. Accepted presentation at the World Federation of Chiropractic 10th Biennial Congress. Montreal, Quebec.

Green B., Johnson C. & Moreau W. (2009, March). *Is Physical Activity Contraindicated for Individuals with Scoliosis? A Literature Review*. Journal of Chiropractic Medicine Volume 8, Issue 1, Pages 25-37.

Moreau W. (2009, April). *A Survey Comparison of Sports Certified Chiropractors and Multiple Disciplinary Care Verses General Practice Chiropractors*. Presented at the American Chiropractic Board of Sports Physician's™ 2009 Sports Science Symposium.

Manison A., Manison J. & Moreau W. (2009, April). *Foot Pain in a Recreational Athlete*. American Chiropractic Board of Sports Physician's™ 2009 Sports Science Symposium Abstract.

Moreau W. (2008, March). *Vital Sign Alterations Associated With Beverage Intake – A Brief Case Series of two Patients*. American Chiropractic Board of Sports Physician's™ 2008 Sports Science Symposium Abstract Submission.

Moreau W. (2008, March). *Leg Pain in a Cross Country Runner*. American Chiropractic Board of Sports Physician's™ 2008 Sports Science Symposium Abstract Submission.

Moreau W. (2008, March). *Identifying Chiropractic Approaches to Manipulation in Patients with Spondylolisthesis*. American Chiropractic Board of Sports Physician's™ 2008 Sports Science Symposium Abstract Submission.

Moreau W. (2007). *The American Chiropractic Board of Sports Physician's supports the Journal of Chiropractic Medicine*. Journal of Chiropractic Medicine. 2007; 6:85-6.

Moreau W. (2007, April). *A Survey of Chiropractic Sports Certificants Regarding Publication Requirements Abstract*. Presented at the American Chiropractic Board of Sports Physician's™ 2007 Sports Science Symposium. Minneapolis, MN.

Moreau W. (2007, April). *Uncontrolled Hypertension in a 33 Year Old Runner*. Presented at the American Chiropractic Board of Sports Physician's™ 2007 Sports Science Symposium. Minneapolis, MN.

DeWitt J. & Moreau W. (2007, April). *Survey of the Emergency Service Available at High School Football Games in Ohio Abstract*. Presented at the American Chiropractic Board of Sports Physician's™ 2007 Sports Science Symposium. Minneapolis, MN.

Moreau W. & Stoos W. (2006, June). *Informed Consent – It is All about Communication*. Journal of the American Chiropractic Association May - June 2006 pp 15-18.

Moreau W. (2006, March). *A Survey of Chiropractic Practice Patterns in Concussion Assessment and Management Abstract*. Presented at the American Chiropractic Board of Sports Physician's™ 2006 Sports Science Symposium. **Leonard Schroeder Award - Best Original Research Abstract**

Moreau W. (2006, March). *Identifying Chiropractic Specialties Coverage of Sports Abstract*. Presented at the American Chiropractic Board of Sports Physician's™ 2006 Sports Science Symposium.

Moreau W. & Murdock J. (2006, March). *Complications Associated with the use of Low Intensity Laser in Patients with Discopathy Abstract*. Presented at the American Chiropractic Board of Sports Physician's™ 2006 Sports Science Symposium.

Moreau W. (2006, March). *A Survey of High School Athletes Nutritional Supplement Usage and Resources Abstract*. Presented at the American Chiropractic Board of Sports Physician's™ 2006 Sports Science Symposium.

Moreau W. (2006, February). *Mild Traumatic Brain Injuries: Evaluation and Care*. Chiropractic Products, pp 18-20, FEB 2006

Moreau W. (2005, July). *Subdural Hematoma in a High School Football Player Abstract*. Presented at the American Chiropractic Board of Sports Physician's™ 2005 Sports Science Symposium.

Moreau W. (2005, July). *Reporting Frequency of Concussion in High School Football Abstract*. Presented at the American Chiropractic Board of Sports Physician's™ 2005 Sports Science Symposium.

Moreau W. (2005, July). *Leg Weakness in a High School Football Player Abstract*. Presented at the American Chiropractic Board of Sports Physician's™ 2005 Sports Science Symposium.

Moreau W. (2005, July). *A Covenant of Trust*. Editorial - Dynamic Chiropractic July 30, 2005 Vol23 No6 pp 10.

Moreau W. (2003, February). *Content Recommendations for the Sideline Bag*. Iowa Chiropractic Society Journal FEB 2003.

Moreau W. (2002). *The Development of an Ethics Policy in a Chiropractic Specialty*. The Journal of Chiropractic Education, 2002 Vol 16, No 1.

Moreau W., Kintner L. & Ryan E. (1997). *Rehabilitation*. Chapter of the text Conservative Management of Sports Injuries by Williams and Wilkins.

Moreau W. (1994, August). *Bracing and Splinting in High School Athletics*. Guest Editorial in Chiropractic Sports Medicine, Vol 8, No 4, Aug 94 p 115.

Moreau W., Reed M. & Vitteriti, P. (1994, May). *A Round Table Discussion on Concussion*. Chiropractic Sports Medicine, Vol 8, No 2 May 94 pp 71-80.

Moreau W. & Nook B. (1993). *Therapeutic Muscle Stretching in Athletics*. Video production in cooperation with Northwestern Health Sciences University.

Moreau W. (1992, September). *The Chiropractors Role in reducing Catastrophic Football Injuries*. Dynamic Chiropractic September 24 1992, pp 13-27.

Moreau W. & Nook B. (1991, November). *Concussion in High School Football: Rulings, Sideline Evaluation, and Return Criteria*. Chiropractic Sports Medicine, Vol 5, No 4 Nov 1991 pp 98-103.

Moreau W. (1998). *Sternal Fractures and Associated Cardiovascular Insult*. ACA Journal Chiro 1988: 25 (1) pp 67-69.

Postgraduate Education Activities

Presented over 400 educational lectures nationally and internationally. The following topics are examples of the presentations; Sports medicine: prevention of injury and illness in athletics, sports related concussion.

2022

January 28, 2022 University of Western States, Denver Colorado; DACBSP Practical Skills and Sports Chiropractic

2021

December 10-11, 2021 University of Western States, Maui Hawaii; Correlative Case Studies: Spine, Hip and Knee

August 28, 2021 University of Western States, Webinar; DACBSP Concussion

July 31, 2021 University of Western States, Webinar; DACBSP Team Physician Concepts

February 27, 2021 University of Western States, Webinar; CCSP Correlative Case Studies

January 23, 2021 University of Western States, Webinar; CCSP Preparticipation Examination

2020

December 12, 2020 University of Western States, Webinar; CCSP Team Physician Concepts

October 25, 2020 Colorado Chiropractic Association, Webinar; Concussion

October 17, 2020 New Hampshire Chiropractic Association, Manchester New Hampshire; Current Trends in the Management of Sports-Related Concussions

September 26, 2020 Colorado Chiropractic Association, Webinar; Pre-participation Examination

February 29, 2020 Ohio State Chiropractic Association, Canton Ohio; The Role of Chiropractic in Olympic Sports Medicine and the Preparticipation Examination

February 14, 2020 Northwestern Health Sciences University, Minneapolis Minnesota; Current Trends in the Management of Sports Related Concussions

January 25-26, 2020 Cleveland University-Kansas City, Overland Park Kansas; DACBSP Team Physician Concepts, Concussion and the Pediatric Athlete

2019

September 21, 2019 National University of Health and Science, Denver Colorado; DACBSP Team Physician Concepts, Concussion and the Pediatric Athlete

August 24-25, 2019 National University of Health and Science, Phoenix Arizona; CCSP The Spine Concussion, and Team Physician Concepts

July 27, 2019 University of Western States, Portland Oregon; CCSP Spine, Concussion and team Physician Concepts

July 20, 2019 Southern California University of Health and Sciences, Denver Colorado; CCSP Correlative Case Studies in Sports Chiropractic

July 13, 2019 Cleveland University-Kansas City, Overland Park Kansas; CCSP Correlative Case Studies in Sports Chiropractic

May 1-3, 2019 Steadman Philippon Research Institute: Injury Prevention Symposium, Vail Colorado; Injury Prevention in Elite Sport

April 27, 2019 American Chiropractic Board of Sports Physician, Salt Lake City Utah; The Clinicians Role in Preventing and Managing Sexual Abuse in Sport

April 25, 2019 American Chiropractic Board of Sports Physician, Salt Lake City Utah; Principles Workshop: Sport Related Concussion, Spine in Sport and Medical Legal Issues in Sport

April 11, 2019 South Dakota Chiropractic Association: Super Conference; Rapid City South Dakota (via Zoom); The Role of Chiropractic in Olympic Sports

April 4, 2019 New York State Chiropractic Association, Depew New York; The Role of Chiropractic in Olympic and Paralympic Sports

March 23, 2019 North Carolina Chiropractic Association, Raleigh North Carolina; The Role of Chiropractic in Olympic and Paralympic Sports

February 7, 2019 United States Olympic Committee: Grand Rounds, Colorado Springs Colorado; Wrist Intersection vs de Quervain Tenosynovitis

2018

December 14-15, 2018 University of Western States, Kuai Hawaii; Integrated Case Studies Lumbosacral Sacroiliac, Hip and Ankle Region.

November 30, 2018 Summit on Sexual Abuse in Sport: Building Action Plans for Sports Medicine Providers, Pittsburgh Pennsylvania; Preventing Abuse through Implementing Standards of Care in Atypical Settings

October 19, 2018 Georgia Chiropractic Association, Atlanta Georgia; The Role of Chiropractic and Athlete Care

September 21, 2018 New York Chiropractic College: Homecoming, Seneca Falls New York, The Role of Chiropractic in Sports

September 7, 2018 American Chiropractic Association, Milwaukee Wisconsin; Current Trends in Sports Related Concussion

July 10, 2018 NCAA Sport Science Institute Summit on Pain Management in College Athletes, Indianapolis Indiana; United States Olympic Committee Opiate Use Reduction Strategies

June 28, 2018 National Athletic Trainers' Association, New Orleans Louisiana; The Epidemiology of Olympic and Paralympic Games Injuries and Illness: What you need to Know

May 28, 2018 Cleveland University-Kansas City, Overland Park Kansas; CCSP The Spine, Concussion and Team Physician Concepts

May 4, 2018 Steadman Philippon Research Institute, Vail Colorado; US Coalition Research Projects

May 4, 2018 Steadman Philippon Research Institute, Vail Colorado; State of Concussion Screening

April 14, 2018 American Chiropractic Board of Sports Physician, San Diego California; Keynote Lecture: The Future of Chiropractic Sports Medicine

April 14, 2018 American Chiropractic Board of Sports Physician, San Diego California; Beating Bugs with Technology: Infectious Disease in the Sport Setting

April 13, 2018 American Chiropractic Board of Sports Physician, San Diego California; Tactical Sports Medicine Panel with Joe Dulla, Fernando Montes, Joe Horrigan and Bill Moreau (moderator)

April 12, 2018 American Chiropractic Board of Sports Physician, San Diego California; Principles Workshop: Sport Related Concussion, Spine in Sport and Medical Legal Issues in Sport

March 24, 2018 Southern California University of Health and Sciences, Boston Massachusetts; DACBSP Team Physician Concepts, Concussion and the Pediatric Athlete

March 17-18, 2018 Southern California University of Health and Sciences, Nashville Tennessee; CCSP The Spine, Concussion and Team Physician Concepts

2017

December 15-16, 2017 University of Western States, Maui Hawaii; Chiropractic Management of the Patient with Complex Cervical Spine Issues and Clinical Update on the Evaluation and Management of Sports Related Concussion

September 16, 2017 Kentucky Chiropractic Association, Lexington Kentucky; Telling the Story of the Efficacy of Chiropractic Care

September 9-10, 2017 Southern California University of Health and Sciences, Salt Lake City Utah; CCSP The Spine, Concussion and Team Physician Concepts

August 26, 2017 Colorado Chiropractic Association, Colorado Springs Colorado; Pre-participation Examination

August 19, 2017 Tennessee Chiropractic Association Southern Chiropractic Conference, Nashville Tennessee; Building an Olympic Champion: The Difference of a Heartbeat

August 1, 2017 UR Medicine, Rochester New York; The Olympic Ideal: How Athletes Prepare and Compete in the World Games

July 15, 2017 Southern California University of Health and Sciences, Denver Colorado; DACBSP Advanced Case Correlations

June 23, 2017 University of Western States, Portland Oregon; Graduation Commencement Keynote

June 22, 2017 South Carolina Chiropractic Association Annual Conference, Myrtle Beach South Carolina; Building an Olympic Champion: The Difference of a Heartbeat

June 10, 2017 Southern California University of Health and Sciences, Whittier California; DACBSP Team Physician Concepts, Concussion, and the Pediatric Athlete

May 20, 2017 Wyoming Chiropractic Association, Jackson Hole Wyoming; The Preparticipation Examination and The Role of Chiropractic in Olympic Sports Medicine

May 19, 2017 Wyoming Chiropractic Association, Jackson Hole Wyoming; Concussion Update: Current Concept in the Management of Concussion

May 3-5, 2017 Federal Chiropractic Licensing Board, Orlando Florida; Legislative Challenges Around Preparticipation Physical Examination and Concussion

April 22, 2017 American Chiropractic Board of Sports Physicians Symposium, Colorado Springs Colorado; Practice Management Mentoring

April 21, 2017 American Chiropractic Board of Sports Physicians Symposium, Colorado Springs Colorado; Get in the Game: How You Can Help Team USA

April 20, 2017 American Chiropractic Board of Sports Physicians Symposium, Colorado Springs Colorado; Sports Chiropractic Principles and Practice Workshop: Spine, Concussion, and Concepts of a Sports Physician

April 8, 2017 Wisconsin Chiropractic Association, Madison Wisconsin; Concussion, Evaluation & Management

April 1-2, 2017 Cleveland University-Kansas City, Overland Park Kansas; CCSP The Spine, Concussion, and Team Physician Concepts

March 18, 2017 5th World Conference on Prevention of Injury and Illness in Sport: International Olympic Committee Team Physician Meeting, Monte Carlo Monaco; Get hip with injury by providing a correct hip screening examination.

March 16, 2017 5th World Conference on Prevention of Injury and Illness in Sport: International Olympic Committee Team Physician Meeting, Monte Carlo Monaco; Beating Bugs with Technology

March 16, 2017 5th World Conference on Prevention of Injury and Illness in Sport: International Olympic Committee Team Physician Meeting, Monte Carlo Monaco; The Past, Present, and Future of Medical Records in the Prevention Injury and Illness in Athletes: The Team USA Model

March 16, 2017 5th World Conference on Prevention of Injury and Illness in Sport: International Olympic Committee Team Physician Meeting, Monte Carlo Monaco; Unique Aspects of the Periodic Health Evaluation for Injury and Illness Prevention in Paralympic Athletes: A Case-Based Discussion

March 16, 2017 5th World Conference on Prevention of Injury and Illness in Sport: International Olympic Committee Team Physician Meeting, Monte Carlo Monaco; Upper Extremity Examarama

March 10, 2017 Minnesota Chiropractic Association, Minneapolis Minnesota; Meeting the Challenges of Sports Medicine with Chiropractic

March 3, 2017 Nebraska Chiropractic Physician Association, Omaha Nebraska; Building an Olympic Champion: The Difference of a Heartbeat

February 18, 2017 Joint Commission on Sports Medicine, Columbus Ohio; If You Have a Body, You Are an Athlete: Inclusion of All People in Sport.

February 11-12, 2017 Life Chiropractic College West, Hayward California; CCSP The Spine, Concussion and Team Physician Concepts

January 28, 2017 Steadman Philippon Research Institute, Conference on the Prevention of Injury & Illness in Sport, Vail Colorado; Injury and Illness during the 2016 Rio Olympic and Paralympic Games

January 27, 2017 Steadman Philippon Research Institute, Conference on the Prevention of Injury & Illness in Sport, Vail Colorado; USOC Injury Surveillance Program

January 21-22, 2017 University of Western States, Portland Oregon; CCSP Correlative Case Studies in Sports Chiropractic

2016

December 9-10, 2016 University of Western States, Maui Hawaii; Integrative Sacroiliac Joint and Lower Extremity Care Strategies

December 8, 2016 American College of Sports Medicine: Advanced Team Physician Course, San Diego California; Preparing the Medical Team for the Olympic Games

December 8, 2016 American College of Sports Medicine: Advanced Team Physician Course, San Diego California; Review of Rio Olympics: What Did We Learn?

December 8, 2016 American College of Sports Medicine: Advanced Team Physician Course, San Diego California; The Making of an Olympic Champion: the Difference of a Heartbeat

November 11, 2016 Congress of Chiropractic State Association, Phoenix Arizona; Controversies in Concussion: Where are we now?

November 11, 2016 Congress of Chiropractic State Association, Phoenix Arizona; Telling the Story of the Effectiveness of Chiropractic Care for Third Party Payers

October 21-22, 2016 Washington State Chiropractic Association, Seattle Washington; Building an Olympic Champion: The Difference of a Heartbeat

October 7, 2016 Illinois Chiropractic Society Annual Convention, Naperville Illinois; Evidenced Based Practice

September 24, 2016 Southern California University of Health and Sciences Integrative Conference; Whittier California; Innovate: Learning from the Past

September 23, 2016 Student American Chiropractic Association, Portland Oregon; Innovate: Learning from the Past

June 25, 2016 Southern California University of Health and Sciences, Denver Colorado; CCSP The Spine, Concussion, and Team Physician Concepts

May 14-15, 2016 University of Western States, Portland Oregon; CCSP Correlative Case Studies in Sports Chiropractic

April 28-30, 2016 University of Western States, Orlando Florida; Annual Symposium

March 12, 2016 Southern California University of Health and Sciences, Newport Beach California; DACBSP The Advanced Case Correlation

February 27-28, 2016 Southern California University of Health and Sciences, Marina Del Rey California; CCSP The Spine, Concussion, and Team Physician Concepts

February 24, 2016 United States Senate Hearing, Washington D.C.; Senate Hearing: Zika Virus

February 20, 2016 Ohio Chiropractic Association, Akron Ohio; Concussion Protocol and Sports Injury

February 6-7, 2016 Southern California University of Health and Sciences, Cleveland Ohio; DACBSP Team Physician Concepts, Concussion, and the Pediatric Athlete

January 30-31, 2016 Southern California University of Health and Sciences, Mesa Arizona; CCSP Correlative Case Studies in Sports Chiropractic

January 23-24, 2016 Parker University, Dallas Texas; CCSP Correlative Case Studies in Sports Chiropractic

January 15-17, 2016 Southern California University of Health and Sciences, Anchorage Alaska; CCSP Chiropractic Management of the Extremities Pt II, Correlative Case Studies in Sports Chiropractic, and Preparticipation Examination

2015

November 13, 2015 Congress of Chiropractic State Association, Charleston South Carolina; Advances in Legislation that Support an Increasing Role for the Doctor of Chiropractic

November 13, 2015 Congress of Chiropractic State Association, Charleston South Carolina; Building an Olympic Champion: Difference of a Heartbeat

October 24-25, 2015 NFL – International Sports Concussion Research Think Tank, London England; Concussion Research and Education

October 15-16, 2015 International Olympic Committee, Lausanne Switzerland; International Federation Medical Commission Chairperson Meeting: USOC Experience with Electronic Medical Records

September 30, 2015 GE Mind and the Machines, San Francisco California; Asset Performance Management: The Power of Performance

September 26-27, 2015 Palmer College of Chiropractic, Pittsburgh Pennsylvania; The Spine, Concussion and Team Physician Concepts

September 19, 2015 Chiropractic Association of France: Pediatric Symposium, Paris France; Assessment and Management of Concussion in the Adolescent and Pediatric Population

September 11, 2015 International Research Centre for Prevention and Protection of the Athlete Health Symposium, Wonju South Korea; National Olympic Committee's Expectation to 2018 PyeongChang Medical Service

September 10, 2015 International Research Centre for Prevention and Protection of the Athlete Health Symposium, Seoul South Korea; Medical Support for National Team Athlete, US

August 25, 2015 University of California Los Angeles 22nd Annual VA/UCLA Physical Medicine and Rehabilitation Research Day, Los Angeles California; Managing Musculoskeletal Injuries

August 22, 2015 Southern California University of Health Sciences, Newport Beach California; Concepts of the Team Physician and the Preparticipation Examination

May 3-7, 2015 International Olympic Committee, Qatar Saudi Arabia; Team Physician Meeting

April 29-30, 2015 Centricity Live, Orlando Florida; Team USA and Actionable Analytics

April 24, 2015 Chiropractic Sports Science Symposium, Anaheim California; Current Trends in Pre-Hospital Care of the Spine Injured Athlete

April 23, 2015 Chiropractic Sports Science Symposium, Anaheim California; Principles Workshop: Spine – Pathology, History, Physical Exam, and Management

April 23, 2015 Chiropractic Sports Science Symposium, Anaheim California; Principles Workshop: Concussion – Mechanism of Injury, Pathophysiology, History, and Physical Exam

April 21-25, 2015 ACBSP, Los Angeles California; Annual Symposium

April 15-17, 2015 United States Olympic Committee, Toronto Canada; PanAm Sports Medicine Congress

March 30-31, 2015 FNIH Sports and Health Research Program, Washington D.C.; Stakeholders Board Meeting

March 19-20, 2015 Association of Chiropractic Colleges Educational Conference, Research Agenda Conference, Las Vegas Nevada; Interprofessional Collaboration: Exploring a New World of Possibilities for the Chiropractic Profession

March 7, 2015 George Mason University, Manassas Virginia; CCSP Advanced Correlated Studies

February 28, 2015 Southern California University of Health Sciences, Newport Beach California; CCSP Team Physician Concepts

February 7-8, 2015 Palmer College of Chiropractic, Colorado Springs Colorado; CCSP Advanced Correlated Studies

January 31, 2015 Parker University Symposium, Las Vegas Nevada; Chiropractic Care in Olympic Medicine

January 21-22, 2015 2015 Youth Sport Safety Governing Bodies Meeting, New York New York

January 16-17, 2015 Inter-Association Task Force for Appropriate Care of the Spine Injured Athlete Participant, Pensacola Florida

2014

December 11-13, 2014 University of Western States, Kauai Hawaii; Integrative Spine and Hip Care Strategies

November 7, 2014 American College of Cardiology – Colorado Chapter, Broadmoor Hotel Colorado Springs Colorado; Building an Olympic Champion: The Difference of a Heartbeat

October 8, 2014 PASSO, Colorado Springs Colorado; Medical Aspects of High Performance

October 4-5, 2014 Wisconsin Chiropractic Society Annual Meeting, Madison Wisconsin; Concussion and Chiropractic Care of the Patient with Spinal Pathology

September 27-28, 2014 Southern California University of Health Sciences, Newport Beach California; CCSP Team Physician Concepts

September 19, 2014 International Olympic Committee, Lausanne Switzerland; Post Sochi Anti-Doping Debrief

September 12-13, 2014 AIUM Conference, Colorado Springs Colorado; Musculoskeletal Upper Extremity

September 9-11, 2014 Sports Analytics Innovation Summit, San Francisco California; Big Data Drives Big Changes in Olympic Sports Medicine

September 6-7, 2014 Palmer College of Chiropractic, George Mason University Manassas Virginia; CCSP Team Physician Concepts

August 24-25, 2014 NFL – International Sports Concussion Research Think Tank, New York New York; Concussion Research and Education

August 23, 2014 Southern California University of Health Sciences, George Mason University Manassas Virginia; Team Physician Concepts, Concussion and the Pediatric Athletic

August 4, 2014 Southern California University of Health Sciences, Newport Beach California; DACBSP Advanced Case Correlation

August 2, 2014 Department of Defense – First Special Forces Group, Seattle Washington; Techniques of Manual Medicine

July 24-25, 2014 American Medical Society for Sports Medicine, Boulder Colorado; Emergency Action Plans and Preparing for Disasters

June 7, 2014 Palmer College of Chiropractic, Davenport Iowa; The Spine and Concussion in Sports

May 4-7, 2014 Centricity Conference, Denver Colorado; GE Healthcare's IT Education Conference

May 2, 2014 Palmer College of Chiropractic, Port Orange Florida; Homecoming Key Note Speaker

April 22-26, 2014 ACBSP, Orlando Florida; Annual Symposium

April 11, 2014 International Olympic Committee World Conference: Prevention of Injury and Illness in Sport, Monaco France; Point of Ultrasound Technology Empowering Elite Athlete Care

April 10-16, 2014 International Olympic Committee, Monaco and Madelieu France; Advanced Team Physician Course

March 29-31, 2014 AIUM Conference/Lecture, Las Vegas Nevada; Keeping Olympic Athletes in the Game: the Role of Diagnostic Ultrasound

January 18-19, 2014 University of Western States; Portland Oregon; CCSP Team Physician Concepts

January 4-5, 2014 Southern California University of Health Sciences, Newport Beach California; CCSP Team Physician Concepts

2013

December 13-16, 2013 University of Western States, Oahu Hawaii; Clinical Management and Diagnosis of the Cervical Spine

October 29, 2013 Washington High School Athletic Association, Washington DC; Consussion

October 12, 2013 University of Western States, Portland Oregon; Annual Symposium

October 4-5, 2013 Northeast Seminars, Chicago Illinois; Diagnosis and Manual Therapy for Musculoskeletal Pathology

September 28-29, 2013 Northeast Seminars, New York City New York; Diagnosis and Manual Therapy for Musculoskeletal Pathology

September 7-8, 2013 Palmer College of Chiropractic, Atlanta Georgia; CCSP Team Physician Concepts

August 23-24, 2013 Palmer College of Chiropractic, Davenport Iowa; DACBSP Advanced Case Correlation

August 11, 2013 Southern California University of Health Sciences, Newport Beach California; CCSP Correlative Case Studies

August 10, 2013 Palmer College of Chiropractic, Davenport Iowa; Homecoming Key Note Speaker

August 1-4, 2013 Academy Sports Dentistry, Philadelphia Pennsylvania; Lecture

May 28-June 1, 2013 ACSM, Indianapolis Indiana; Annual Conference

May 3, 2013 Palmer College of Chiropractic, San Jose California; Homecoming Key Note Speaker

April 16-21, 2013 ACBSP, Colorado Springs Colorado; Annual Symposium

March 16-17, 2013 University of Western States, Portland Oregon; CCSP Team Physician Concepts

March 23-24, 2013 Southern California University of Health Sciences, Newport Beach California; CCSP Team Physician Concepts

March 7-10, 2013 American Osteopathic Academy of Sports Medicine, Colorado Springs Colorado; Annual Meeting

February 21-24, 2013 JCSM, Point Clear Alabama; Annual Conference

February 16-17, 2013 Parker College of Chiropractic, Dallas Texas; CCSP Correlative Case Studies

February 2-3, 2013 Palmer College of Chiropractic, Port Orange Florida; CCSP Team Physician Concepts

January 5-6, 2013 Southern California University of Health Sciences, Newport Beach California; DACBSP Team Physician Concepts, Concussion and the Pediatric Athlete

2012

December 15, 2012 Southern California University of Health Sciences, Whittier California; Graduation Key Note Speaker

December 8-10, 2012 University of Western States, Maui Hawaii; The Spine: A Clinical and Radiological Evaluation

November 11, 2012 Olympic Training Center, Colorado Springs Colorado; Pediatrics Conference

November 3-4, 2012 Palmer College of Chiropractic, Puerto Rico; CCSP Team Physician Concepts

October 27-28, 2012 United States Olympic Committee, Colorado Springs Colorado; Introduction to Neuropsychology and Concussion

October 20-21, 2012 Palmer College of Chiropractic, Columbus Ohio; CCSP Team Physician Concepts

October 13-14, 2012 Palmer College of Chiropractic, Davenport Iowa; DACBSP Advanced Correlative Case Studies

September 22-23, 2012 Southern California University of Health Sciences, Newport Beach California; CCSP Team Physician Concepts

September 8-9, 2012 Southern California University of Health Sciences, Newport Beach California; DACBSP Team Physician Concepts, Concussion and the Pediatric Athlete

August 25-26, 2012 Southern California University of Health Science, Newport Beach California; DACBSP Advanced Correlative Case Studies

June 9-10, 2012 University of Western States, Portland Oregon; CCSP Team Physician Concepts

May 18, 2012 Palmer College of Chiropractic, San Jose California; Palmer Homecoming Keynote Speaker

April 23-28, 2012 University of Western States, Portland Oregon; ACBSP Annual Symposium

April 4-8, 2012 ACSM, Indianapolis Indiana; Annual Symposium

March 30-31, 2012 Parker College, Dallas Texas; CCSP Team Physician Concepts

March 24-25, 2012 The Biomechanical Movement Matrix, Toledo Ohio; Lecture

March 9-10, 2012 University of Western States, Portland Oregon; CCSP Team Physician Concepts

February 2-4, 2012 JCSM, Portland Oregon; Annual Meeting

January 14-15, 2012 Palmer College of Chiropractic, Davenport Iowa; CCSP Taping and Bracing

2011

December 3-5, 2011 University of Western States, Honolulu Hawaii; Radiology and Pediatrics Conference

November 12-13, 2011 Palmer College of Chiropractic, Raleigh North Carolina; CCSP Correlative Case Studies

October 1-2, 2011 Palmer College of Chiropractic, San Jose California; CCSP Team Physician Concepts

September 24-25, 2011 Southern California University of Health Science, Philadelphia Pennsylvania; DACBSP Advanced Correlative Case Studies

September 10-11, 2011 Southern California University of Health Sciences, Newport Beach California; CCSP Correlative Case Studies

August 13, 2011 Palmer College of Chiropractic, Davenport Iowa; Homecoming Key Note Speaker

July 28, 2011 Pan American Sports Medicine Congress, Guadalajara Mexico; Chiropractic Science Applied in the Multiple Disciplinary Management of Sports Medicine

July 23, 2011 United States Olympic Committee, Colorado Springs Colorado; Concussion Symposium

June 25-26, 2011 University Western States, Portland Oregon; Annual Symposium

June 11-12, 2011 Southern California University of Health Sciences, Whittier California; Correlative Case Studies CCSP

April 30-May 1, 2011 Palmer College of Chiropractic, Port Orange Florida; DACBSP Team Physician Concepts, Concussion and the Pediatric Athlete

April 16-17 2011 Palmer College of Chiropractic, Davenport Iowa; DACBSP Lower Extremity #2 Orthopedic

March 31- April 11, 2011 International Olympic Committee, Corsica and Monaco France; Advanced Team Physician Course

March 26-27, 2011 Southern California Health Sciences University, Philadelphia Pennsylvania; ACBSP Team Physician Concepts, Concussion and the Pediatric Athlete

March 19-20, 2011 University of Western States, Portland Oregon; CCSP Correlative Case Studies

March 12-13, 2011 Palmer College of Chiropractic, Davenport Iowa; DACBSP Lower Extremity Orthopedic

February 24-26, 2011 Joint Commission on Sports Medicine Annual Conference, Philadelphia Pennsylvania

February 19-20, 2011 Southern California University of Health Sciences, Colorado Springs Colorado; CCSP Kick-Off Team Physician Concepts

February 12-13, 2011 Southern California University of Health Sciences, Whittier California; DACBSP Advanced Correlative Studies

2010

November 13-14, 2010 Palmer College of Chiropractic, Lansing Michigan; CCSP Taping/Bracing

October 23-24, 2010 University of Western States, Portland Oregon; CCSP Team Physician Concepts

October 16-17, 2010 Palmer College of Chiropractic, Lansing Michigan; CCSP Kick-Off Team Physician Concepts

October 2-3, 2010 Palmer College of Chiropractic, Port Orange Florida; CCSP Kick-Off Team Physician Concepts

2009

November 14-15, 2009 Parker College of Chiropractic and the United States Olympic Training Center, Colorado Springs Colorado; Concepts of a Team Physician and the Spine in Sport

November 6-7, 2009 Parker College of Chiropractic, Dallas Texas; Special Considerations in Sports Chiropractic and Correlative Studies

October 24-25, 2009 Palmer College of Chiropractic, Dulles Virginia; Concepts of a Team Physician and the Spine in Sports

September 26-27, 2009 Palmer College of Chiropractic, San Jose California; Concepts of a Team Physician and the Spine in Sports

August 29-30, 2009 Western States Chiropractic College, Portland Oregon; Concepts of a Team Physician and the Spine in Sports

August 22 - 23, 2009 Parker College of Chiropractic, Dallas Texas; Concepts of a Team Physician and the Spine in Sports

June 13 - 14, 2009 Western States Chiropractic College, Portland Oregon; Correlative Case Studies

May 16, 2009 Kansas Chiropractic Association, Wichita Kansas; Spine in Sports and Management of Mild Traumatic Head Injury

April 29 - May 1, 2009 Palmer College, Puerto Vallarta Mexico; Sports Chiropractic the Lower Extremity and Spine in Sports

April 15-18, 2009 American Chiropractic Board of Sports Physicians, La Jolla California; Sports Science Symposium, Concepts of a Team Physician

April 4-5, 2009 Western States Chiropractic College, Portland Oregon; Chiropractic Management of the Lower Extremity

March 06, 2009 Palmer College of Chiropractic West, San Jose California; Commencement Speech: The One and the Many

February 28-29, 2009 Parker Chiropractic College, Dallas Texas; Spinal injuries in Athletics and Managing Mild Traumatic Brain Injury

February 21, 2009 Palmer College of Chiropractic, Port Orange Florida; Chiropractic Management of Lumbar Injuries in Sport

February 20, 2009 Palmer College of Chiropractic, Port Orange Florida; Defining Chiropractic

February 7-8, 2009 Palmer College of Chiropractic, Davenport Iowa; Assessment and Management of Mild Traumatic Brain Injury, Advanced Applications of Athletic Taping

January 24-25, 2009 Western States Chiropractic College, Portland Oregon; Applications of Taping and Bracing CCSP

2008

December 13-14, 2008 Palmer College of Chiropractic, Columbus Ohio; Applications of Taping and Bracing

October 25-26, 2008 Palmer College of Chiropractic, Port Orange Florida; CCSP Taping and Bracing

October 9-11, 2008 Palmer College of Chiropractic, San Jose California; Palmer Homecoming: Destination Success

September 27-28, 2008 Palmer College of Chiropractic, Columbus Ohio; CCSP Kick-Off

September 20-21, 2008 Palmer College of Chiropractic, Port Orange Florida; CCSP Kick-Off

September 6-7, 2008 Western States Chiropractic College, Portland Oregon; CCSP Kick-Off

August 7-9, 2008 Palmer College of Chiropractic, Davenport Iowa; Destination Success, Professional Boundaries and Ethics, Part I and Part II

May 15-17, 2008 ACBSP, Fort Lauderdale Florida; Concepts of a Team Physician and Medical Aspects of a Sports Physician

April 26-27, 2008 Palmer College of Chiropractic, Davenport Iowa; Cardiology of the Athletic Heart and the Pediatric Athlete

April 12-13, 2008 Palmer College of Chiropractic, Davenport Iowa; License Renewal Series, Chiropractic Care and Imaging of the Patient with Lumbar Spine Pathology

March 29, 2008 Palmer College of Chiropractic, Davenport Iowa; Destination Success, The Cornerstones to Long Term Success in Chiropractic Practice

March 20, 2008 Palmer College of Chiropractic, Iowa Chiropractic Society, and Iowa Communications Network (ICN), Davenport Iowa; Core Stabilization.

March 1-2, 2008 Parker Chiropractic College, Dallas Texas; Taping and Bracing in Chiropractic Practice

February 23-28, 2008 Palmer College of Chiropractic, Western Caribbean Cruise; A Healthy Tomorrow

February 2-3, 2008 Palmer College of Chiropractic, San Jose California; Taping and Bracing in Chiropractic Practice

February 2-3, 2008 Palmer College of Chiropractic, Port Orange Florida; Taping and Bracing in Chiropractic Practice

November 8-9, 2007 Northwestern Health Sciences University, Bloomington Minnesota; Taping and Bracing in Chiropractic Practice

2007

November 17-18, 2007 Palmer College of Chiropractic, San Jose California; Concepts of the Team Physician and The Spine in Sports

September 22-23, 2007 Parker Chiropractic College, Dallas Texas; Concepts of the Team Physician and The Spine in Sports.

September 15-16, 2007 Palmer College of Chiropractic, Port Orange Florida; Concepts of the Team Physician and The Spine in Sports

August 18-19, 2007 Palmer College of Chiropractic and Colorado Chiropractic Association, Denver Colorado; Applications of Taping and Bracing in Chiropractic.

August 10, 2007 Palmer College of Chiropractic, Davenport Iowa; Working With Your Spouse: The Good, The Bad And The Ugly

June 23-24, 2007 Western State Chiropractic College, Portland Oregon; Chiropractic Management of Lower Extremity Injuries

June 9-10, 2007 Life Chiropractic College, Atlanta Georgia; Chiropractic Care of Special Populations

May 19-20, 2007 Palmer College of Chiropractic, Columbia South Carolina; Applications of Taping and Bracing in Chiropractic

April 21-22, 2007 Palmer College of Chiropractic and Colorado Chiropractic Association, Denver Colorado; Concepts of the Team Physician and The Spine in Sports

April 12, 2007 ACBSP, Minneapolis Minnesota; Concepts of a Team Physician, Medical Legal Aspects of Sports Medicine

March 24-25, 2007 Palmer College of Chiropractic, Columbia South Carolina; Concepts of the Team Physician and The Spine in Sports

March 10-11, 2007 Western State Chiropractic College, Portland Oregon; Taping and Bracing in Chiropractic Care

February 10-11, 2007 Palmer College of Chiropractic, Davenport Iowa; Chiropractic Care for the Patient with Spinal Pathology

January 27-28, 2007 Parker Chiropractic College, Dallas Texas; Taping and Bracing in Chiropractic Care

January 20-21 2007 Western State Chiropractic College, Portland Oregon; Chiropractic Management of Upper Extremity Injuries

January 18, 2007 Palmer Florida, Port Orange Florida; Homecoming: Sports Chiropractic

2006

December 9-10, 2006 Northwestern Health Sciences University, Bloomington Minnesota; Taping and Bracing in Chiropractic Practice

October 14-15, 2006 Western States Chiropractic College, Portland Oregon; Concepts of the Team Physician and The Spine in Sports

September 23-24, 2006 Palmer Institute for Professional Advancement, Dallas Texas; Advanced Clinical Correlations

August 19-20, 2006 Palmer College of Chiropractic, Raleigh North Carolina; Taping and Bracing in Chiropractic Care

June 24-25, 2006 Parker Chiropractic College, Dallas Texas; Taping and Bracing in Chiropractic Care

June 10-11, 2006 Palmer College of Chiropractic, Davenport Iowa; Applications of Taping and Bracing in Chiropractic

May 6-7, 2006 Palmer College of Chiropractic, Raleigh North Carolina; Concepts of the Team Physician and The Spine in Sports

April 9, 2006 Palmer Institute for Professional Advancement, Woodland Hills California; Care for the Patient with Spinal Pathology

April 8, 2006 Palmer Institute for Professional Advancement, Irvine California; Care for the Patient with Spinal Pathology

March 23, 2006 ACBSP, Francisco California; Concepts of a Team Physician, Medical Legal Aspects of Sports Medicine

March 11-12, 2006 Palmer College of Chiropractic, Davenport Iowa; Concepts of the Team Physician and The Spine in Sports

March 5, 2006 Palmer Institute for Professional Advancement, Fresno California; Care for the Patient with Spinal Pathology

March 4, 2006 Palmer Institute for Professional Advancement, Bakersfield California; Care for the Patient with Spinal Pathology

February 18-19, 2006 Palmer Institute for Professional Advancement, San Jose California; Taping and Bracing in Chiropractic Care

January 26-28, 2006 Colorado Chiropractic Association, Breckenridge Colorado; Chiropractic Care of the Extremities

January 21, 2006 Northwestern Health Sciences University, Bloomington Minnesota; Medical Legal Issues and Case Studies

January 14-15, 2006 Palmer Institute for Professional Advancement, Dallas Texas; The Pediatric Athlete and the Preparticipation Examination

2005

December 10, 2005 Northwestern Health Sciences University, Bloomington Minnesota; Chiropractic Keys to Extremity Care

November 5-6, 2005 Northwestern Health Sciences University, Bloomington Minnesota; CCSP The Spine in Sports

October 15-16, 2005 Palmer Institute for Professional Advancement, San Jose California; CCSP The Spine in Sports

August 12, 2005 Palmer Institute for Professional Advancement, Lyceum, Davenport Iowa; Chiropractic Care of the Athlete

August 11, 2005 Palmer Institute for Professional Advancement, Lyceum, Davenport Iowa; Ethics in Chiropractic Practice

May 13, 2005 ACBSP Symposium, Hollywood Florida; Principles Workshop

April 21, 2005 Palmer Institute for Professional Advancement, ICN Class; Risk Management in Chiropractic

April 15-16, 2005 Iowa Chiropractic Society Annual Convention, Des Moines Iowa; Pre-participation Examinations and Traumatic Brain Injuries

April 9-10, 2005 Palmer Institute for Professional Advancement, Raleigh North Carolina; CCSP Kick-Off

April 2-3, 2005 Western States Chiropractic College, Portland Oregon; CCSP Program

2004

December 3-4, 2004 Pro-Sport Rodeo Annual Convention, Las Vegas Nevada; Upper Extremity Injuries

November 13-14, 2004 Western State Chiropractic College, Portland Oregon; CCSP Program

August 12, 2004 Palmer Institute for Professional Advancement, ICN Class; Ethics in Chiropractic Practice

August 14-15, 2004 Western States Chiropractic College, Portland Oregon; CCSP Program

May 15, 2004 Northwestern Health Sciences University, Bloomington Minnesota; Taping and Bracing

April 3-4, 2004 Palmer Institute for Professional Advancement, Port Orange Florida; Concepts of a Sports Physician and the Spine in Sports CCSP Program;

March 12, 2004 American Chiropractic Board of Sports Physicians Annual Symposium, Las Vegas Nevada; Concepts of a Team Physician

March 20-21, 2004 Palmer Institute for Professional Advancement, Phoenix Arizona; Concepts of a Team Physician and the Spine in Sports CCSP Program

March 27-28, 2004 Palmer Institute for Professional Advancement, Indianapolis Indiana; CCSP Concepts of a Team Physician and the Spine in Sports

January 24-25, 2004 Palmer Institute for Professional Advancement, Chicago Illinois; DACBSP Advanced Team Physician Skills, Advanced Taping, Bracing and Splint Fabrication

2003

September 13-14, 2003 Palmer Institute for Professional Advancement, Davenport Iowa; CCSP Clinical Considerations in Sports Chiropractic

August 9, 2003 Palmer Institute for Professional Advancement, Davenport Iowa; Clinical Ethics

April 26-27, 2003 Palmer Institute for Professional Advancement, Richmond Virginia; CCSP Concepts of a Team Physician

April 12-13, 2003 Palmer Institute for Professional Advancement, Davenport Iowa; CCSP Concepts of a Team Physician

March 29-30, 2003 Palmer Institute for Professional Advancement, Chicago Illinois; Sports Diplomat, The Pediatric Athlete

March 14, 2003 ACBSP, Baltimore Maryland; Concepts of a Team Physician

March 1-2, 2003 Northwestern Health Sciences University, Bloomington Minnesota; Certified Chiropractic Sports Physician Course, Taping

January 25-26, 2003 Palmer Institute for Professional Advancement and California Compendium, San Jose California; Extremity Injury in Sport

2002

December 6-8, 2002 Palmer Institute for Professional Advancement and Virginia Compendium, Richmond Virginia; Extremity Injury in Sport

November 9, 2002 Iowa Chiropractic Society and Palmer College Sports Chiropractic Compendium, Des Moines Iowa; Chiropractic and the Athlete

May 5-6, 2002 ACBSP 2002 Chiropractic Sports Sciences Symposium, Dallas Texas; Medical Legal Issues in Chiropractic and Concussion

April 13, 2002 Palmer Institute for Professional Advancement, Lansing Michigan; Concepts of a Team Physician

April 6, 2002 Palmer Institute for Professional Advancement, Greensboro North Carolina; Concepts of a Team Physician

March 14, 2002 Association of Chiropractic Colleges, New Orleans Louisiana; The Development of an Ethics Policy in a Chiropractic Specialty

March 2, 2002 Northwestern Health Sciences University, Bloomington Minnesota; Certified Chiropractic Sports Physician Course, Taping

2001

October 20-21, 2001 Northwestern Health Sciences University, Bloomington Minnesota; CCSP The Spine and Team Physician Concepts

September 22-23, 2001 Northwestern Health Sciences University, Bloomington Minnesota; CCSP Case Studies

July 21-22, 2001 Western States Chiropractic College, Portland Oregon; CCSP Case Studies

July 7-8, 2001 Western States Chiropractic College, Portland Oregon; CCSP Pre-participation Examination and Environmental Issues

June 23-24, 2001 Western States Chiropractic College, Portland Oregon; CCSP Taping and Bracing and Medical Legal Issues

May 19-20, 2001 Palmer Institute for Professional Advancement, Pittsburgh Pennsylvania; CCSP Team Physician Concepts

May 5-6, 2001 Palmer Institute for Professional Advancement, Madison Wisconsin; Rehabilitation in Athletic Injuries

April 28-29, 2001 Northwestern Health Sciences University, Bloomington Minnesota; Taping and Bracing

April 21-22, 2001 Western States Chiropractic College, Portland Oregon; CCSP The Upper Extremity

April 7-8, 2001 Palmer Institute for Professional Advancement, Davenport Iowa; CCSP Team Physician Concepts

March 24-25, 2001 Western States Chiropractic College, Portland Oregon; CCSP Exercise Physiology

March 17-18, 2001 Palmer Institute for Professional Advancement, Davenport Iowa; CCSP Workshop

February 10—11, 2001 Western States Chiropractic College, Portland Oregon; CCSP Soft Tissue Care

February 17, 2001 Northwestern Chiropractic College, Bloomington Minnesota; CCSP Program

January 13-14, 2001 Western States Chiropractic College, Portland Oregon; CCSP Team Physician Concepts

2000

December 02, 2000 Northwestern Chiropractic College, Bloomington Minnesota; Chiropractic Sports Care

November 18, 2000 Northwestern Chiropractic College, Bloomington Minnesota; Chiropractic Sports Care

October 14, 2000 Northwestern Chiropractic College, Bloomington Minnesota; Chiropractic Sports Care

July 22, 2000 Federation of Chiropractic Sports (FICS), Mexico City Mexico; The Spine and Wrist in Sports

June 3-4, 2000 Western States Chiropractic College, Portland Oregon; CCSP Program

January 25-26, 2000 Palmer Institute for Professional Advancement, San Jose California; CCSP Spine in Sports

1999

December 10-12, 1999 Northwestern Health Sciences University, Fort Lauderdale Florida; CCSP Spinal Injuries in Athletics

July 30- August 1, 1999 Los Angeles Chiropractic of Chiropractic, Los Angeles California; Concepts of a Team Physician

June 26-27, 1999 Northwestern Health Sciences University, Seattle Washington; DACBSP Case Studies in Sports Chiropractic

May 22-23, 1999 Northwestern Health Sciences University, Seattle Washington; DACBSP Critical Review of Literature

April 17-18, 1999 Northwestern Health Sciences University, Seattle Washington; DACBSP Pre-participation Examination

March 20-21, 1999 Northwestern Health Sciences University, Bloomington Minnesota; Taping and Bracing: Hands on Session

February 25-28, 1999 Northwestern Health Sciences University, Winter Park Colorado; Conservative Management of Upper Extremity Injuries

1998

August 15, 1998 Iowa Chiropractic Sports Council, Ames Iowa; Concepts of a Team Physician

May 16-17, 1998 Northwestern Health Sciences University, Omaha Nebraska; CCSP Program

May 2, 1998 Board Review Class, Bloomington Minnesota; Principles Workshop for Sports Physicians

April 25-26, 1998 Northwestern Health Sciences University, Dallas Texas; Taping and Bracing

April 18-19, 1998 Northwestern Health Sciences University, Omaha Nebraska; CCSP Taping and Bracing

March 19-22, 1998 Northwestern Health Sciences University, Mexico City Mexico; Spinal Athletic Injuries and Taping and Bracing

February 27-28, 1998 Northwestern Health Sciences University, Omaha Nebraska; CCSP Program

January 31 - February 1, 1998 Northwestern Health Sciences University, Omaha Nebraska; CCSP Program

January 17-18, 1998 Northwestern Health Sciences University, Bloomington Minnesota; Chiropractic Orthopedics Program Taping and Bracing

1997

October 18-19, 1997 Northwestern Health Sciences University, Seattle Washington; CCSP Program

June 21-22, 1997 Northwestern Health Sciences University, Calgary Canada; Rehabilitation of Upper Extremity Injuries

May 31-June 1, 1997 Northwestern Health Sciences University, Denver Colorado; Protective Equipment in Athletics

May 22-25, 1997 Florida State Chiropractic Association, Del Ray Florida; Pre-participation Examination

March 1-2, 1997 Northwestern Health Sciences University, Denver Colorado; Pediatric Considerations in Athletics

February 13-16, 1997 Northwestern Health Sciences University, Banff Canada; Extremity Manipulation

January 31-February 5, 1997 Northwestern Health Sciences University, Mexico City Mexico; Spinal and Head Injuries in Athletics

1996

December 8-9, 1996 Northwestern Health Sciences University, Appleton Wisconsin; Taping and Bracing

June 29-30, 1996 Northwestern Health Sciences University, Seattle Washington; CCSP Program

June 21-23, 1996 Northwestern Health Sciences University, Vancouver Canada; Upper Extremity Injuries in Athletics

May 31-June 1, 1996 Northwestern Health Sciences University, Kansas City Missouri; CCSP Program

May 4-5, 1996 Northwestern Health Sciences University, Kansas City Missouri; CCSP Program

April 20-21, 1996 Palmer Institute for Professional Advancement, Pittsburgh Pennsylvania; Spinal Injuries in Athletics

April 12-14, 1996 Northwestern Health Sciences University, Seattle Washington; CCSP Program

February 14-18, 1996 Northwestern Health Sciences University, Banff Canada; Conservative Management of Upper Extremity Injuries

January 20-21, 1996 Northwestern Health Sciences University, Seattle Washington; CCSP Program

January 13-14, 1996 Northwestern Health Sciences University, Kansas City Missouri; CCSP Program

1995

November 4-5, 1995 Northwestern Health Sciences University, Kansas City Missouri; CCSP Taping and Spine Injuries

October 28-29, 1995 DACBSP, Bloomington Minnesota; Equipment and Technology in Athletics

October 21-22, 1995 Northwestern Health Sciences University, Bloomington Minnesota; CCSP Program

October 7-8, 1995 Kansas Chiropractic Association Fall Convention, Wichita Kansas; Exercise Prescriptions

September 13, 1995 Chiropractic Centennial Foundation, Davenport Iowa; Impingement Syndrome

September 12, 1995 Federation of International Chiropractic Sportive Symposium, Davenport, Iowa; Sideline Care

July 29-30, 1995 Northwestern Health Sciences University, Bloomington Minnesota; Taping and Bracing

July 21-22, 1995 American Chiropractic Association Sports Council Annual Convention, Denver Colorado; Splinting and Bracing

July 5-8, 1995 Chiropractic Centennial Foundation, Washington D.C.; Coordinator of Sports Program

June 10-11, 1995 Northwestern Health Sciences University, Wichita Kansas; Taping and Supports

June 3-4, 1995 Northwestern Health Sciences University, Denver Colorado; Clinical Considerations in the Injured Athlete

May 11-14, 1995 Anglo-European Chiropractic College, Bournemouth England; Injuries to the Upper Extremity

May 8-9 1995 Northwestern Health Sciences University, Bloomington Minnesota; Bachelor of Sciences Program Field Management of Athletic Injuries;

April 29-30, 1995 Northwestern Health Sciences University, Bloomington Minnesota; Bachelor of Sciences Program Field Management of Athletic Injuries;

April 8-9, 1995 Northwestern Health Sciences University, Phoenix Arizona; Taping and Bracing

April 1-2, 1995 Northwestern Health Sciences University, Bloomington Minnesota; DACBSP Advanced Splinting and Bracing

March 25-26, 1995 Palmer Institute for Professional Advancement, Davenport Iowa; Head and Neck Injuries in Athletics

March 3-5, 1995 Northwestern Health Sciences University, Puerto Vallarta Mexico; Second Annual Latin American Chiropractic Congress

February 24-26, 1995 Northwestern Health Sciences University, Banff Canada; Management of Upper Extremity Injuries

February 11-12, 1995 Northwestern Health Sciences University, Wichita Kansas; Management of Upper Extremity Injuries

January 21-22, 1995 Northwestern Health Sciences University, Wichita Kansas; Anterior Knee and Medical/Legal Aspects

1994

December 18-19, 1994 Northwestern Health Sciences University, Wichita Kansas; Extremity Adjusting

December 10-11, 1994 Northwestern Health Sciences University, Milwaukee Wisconsin; Taping and Bracing

November 25-27, 1994 Anglo-European Chiropractic College, Bournemouth England; Spinal Injuries and Extremity Adjusting

November 19-20, 1994 Northwestern Health Sciences University, Denver Colorado; Diplomat of the Chiropractic Sports Physician Course

November 11-12, 1994 Northwestern Health Sciences University, Milwaukee Wisconsin; Extremity Adjusting

October 15-16, 1994 Northwestern Health Sciences University, Seattle Washington; CCSP Taping and Spine Injuries

October 8-9, 1994 Los Angeles College of Chiropractic, San Francisco California; CCSP Team Physician Concepts

September 24-25, 1994 Northwestern Health Sciences University, Denver Colorado; DACBSP Equipment and Technology

August 20, 1994 Iowa Chiropractic Society, Des Moines Iowa; Bracing and Splinting

July 7-17, 1994 Federation International Chiropractic Sportive, Hamilton Island Australia; Hands on Seminar

June 11-12, 1994 Logan College of Chiropractic, Phoenix Arizona; Knee Injuries

May 21, 1994 Northwestern Health Sciences University, Nashville Tennessee; Athletic Taping and Supports

April 14-16, 1994 Palmer Institute for Professional Advancement, Puerto Vallarta Mexico; Spinal Injuries in Athletics

April 9, 1994 Palmer Institute for Professional Advancement, Jacksonville Florida; Concepts of a Sports Physician

February 19-20, 1994 Northwestern Health Sciences University, Nashville Tennessee; Medical Legal Aspects in Sports and Anterior Knee Injuries

January 15-16, 1994 Los Angeles College of Chiropractic, Los Angeles California; Concepts of a Team Physician

1993

December 18-19, 1993 Northwestern Health Sciences University, Bloomington Minnesota; Athletic Taping and Supports

December 11-12, 1993 Logan College of Chiropractic, Columbia South Carolina; Assessment and Management of Cervical and Thoracic Injuries in Athletics

October 2-3, 1993 Northwestern Health Sciences University, Nashville Tennessee; CCSP Assessment and Management of Cervical and Thoracic Injuries in Athletics

September 11-12, 1993 Los Angeles College of Chiropractic, San Jose California; Concepts of a Team Physician

July 17-18, 1993 Logan College of Chiropractic, Fort Lauderdale Florida; Knee Injuries in Athletics CCSP

May 29-30, 1993 Northwestern Health Sciences University, Denver Colorado; Athletic Taping and Supports CCSP

May 15-16, 1993 Federation International Chiropractic Sportive, London England; American Football and Basketball Injuries

May 7-8, 1993 Northwestern Health Sciences University, Bloomington Minnesota; Medical Legal Aspects in Sports

April 14-15, 1993 Northwestern Health Sciences University, Denver Colorado; Extremity Adjusting CCSP

March 6-7, 1993 Northwestern Health Sciences University, Denver Colorado; Anterior Knee Injuries

February 6, 1993 Northwestern Health Sciences University, Bloomington Minnesota; Homecoming: The Doctor of Chiropractic Role in Athletics, the Diagnosis and Treatment of Elbow Injuries, The Doctor of Chiropractic Role in Prevention of Catastrophic Head and Neck Injuries in Football

January 9-10, 1993 Northwestern Health Sciences University, Denver Colorado; CCSP Assessment and Management of Upper Extremity Athletic Injuries

1992

November 12, 1992 Iowa High School Athletic Directors, Storm Lake Iowa; Prevention and On the Field Treatment of Head Injuries

October 24-25, 1992 Northwestern Health Sciences University, Denver Colorado; CCSP Assessment and Management of Cervical and Thoracic Injuries in Athletics

June 27-28, 1992 Iowa Chiropractic Sports Society, Cedar Rapids Iowa; Chiropractors as Sports Physicians; Hand and Finger Injuries in Golf, Baseball, and Tennis

May 30-31, 1992 Northwestern Health Sciences University, Bozeman Montana; CCSP Athletic Taping and Supports

April 11, 1992 Cornbelt Conference Coaches Sports Medicine Clinic, Ruthven Iowa; Field Management of the Spine Injured Athlete

March 28, 1992 Iowa Chiropractic Society, Okoboji Iowa; Athletic Injuries of the Hand and Finger

January 11-12, 1992 Northwestern Health Sciences University, Bozeman Montana; CCSP
Assessment and Management of Upper Extremity Athletic Injuries

1991

December 11-14, 1991 Palmer Health Sciences University, Steamboat Springs Colorado;
Assessment and Management of Cervical Spine Injuries in Athletics

October 5-6, 1991 Northwestern Health Sciences University, Bozeman Montana; CCSP
Assessment and Management of Cervical and Thoracic Injuries in Athletics

September 12, 1991 Northwest Iowa Coaches and Officials Association, Spencer Iowa; Head
Injuries in High School Football

June 8, 1991 Iowa State University, Ames Iowa; Concussion in High School Football: Rulings,
Sideline Evaluation and Return Criteria

April 10-21, 1991 Northwestern Health Sciences University, Appleton Wisconsin; Taping, Supports
and Lab

March 11-12, 1991 Caribbean Chiropractic Symposium, Barbados West Indies; Epidemiology,
Assessment and Management of Cervical Spine Injuries in Athletics

1990

October 27-28, 1990 Northwestern Health Sciences University, Appleton Wisconsin; CCSP
Assessment and Management of Cervical, Thoracic, Head, and Visceral Injuries

Miscellaneous

1986 – 1995 Iowa Lakes Community College, Estherville Iowa; Coaches Certification Class

1987, 1991 Estherville Junior and Senior High School and Algona Garrigan High School Football
Teams, Estherville and Algona Iowa; Preventing Head and Neck Injuries in Football

1999 – 2002 Northwestern Health Sciences University, Bloomington, Minnesota; Sports Care
Bachelor of Science Program

Professional Activities, Awards and Recognitions:

- 2020 Chairman for University of Western States COVID-19 Clinical Standards Work Group
- 2017 American Chiropractic Board of Sports Physicians Torch Award
- 2017 Doctor of Laws Degree from University of Western States
- Inter-Association Task Force for Appropriate Care of the Spine-Injured Athlete 2014
- 2013 Colorado Chiropractic Association Sports Chiropractor of the Year
- Lead author of the American Chiropractic Board of Sports Physician's Concussion Registry 2013
- American College of Sport Medicine - Olympic and Paralympic Issues in Sports Medicine Committee 2013
- American College of Sport Medicine - International Relations Committee 2013
- 2012 USA Department of Health and Human Services - Consumer Health IT Summit featured speaker
- 2012 Robert C. Reed award for Best Abstract
- 2012 John Nash award for Best Multiple Disciplinary Abstract

- 2012 American Chiropractic Board of Sports Physician's Presidential Award
 - 2011 International Olympic Committee – Advanced Team Physician Course
 - 2011 John Nash award for Best Multiple Disciplinary Abstract
 - 2010 American Chiropractic Board of Sports Physician's Lifetime Achievement Award
 - 2010 Robert Reed Award for Best Abstract ACBSP
 - 2010 John N Nash Award for Best Multidisciplinary Abstract ACBSP
 - 2009 Colorado Chiropractic Association Sports Chiropractor of the Year
 - 2006 Leonard Schroder Award for Best Abstract
 - 2006 American Chiropractic Board of Sports Physician's Presidential Sports Chiropractor of the Year
 - 2004 Iowa High School Athletic Directors Association Sports Medicine Specialist.
 - 2003 Iowa High School Athletic Association Sports Medicine Specialist of the year.
 - 2003 Iowa High School Athletic Directors - Sports Physician of the Year
 - 2000 Certificate of Recognition State of Iowa House of Representatives
 - 2000 American Chiropractic Association Council on Sports Injuries and Physical Fitness Sports Chiropractor of the Year
-

Curriculum Vitae

Kristopher Bryan Peterson, DC DABCI BCN FICT Board Eligible in
Neurology

PO Box 211 Hermiston, OR 97838



College

1974-1975 Walla Walla University, College Place, WA
1975 Blue Mountain Community College (One quarter)
Pendleton, OR

1975-1976 University of Oregon, Eugene, OR
Honor Roll- Academic achievement

1976-1979 University of Western States
Completed four-year academic curriculum in three
Teaching assistant two years in gross anatomy labs

Sept, 1979 Graduated Cum Laude Doctor of Chiropractic (DC)

Chiropractic Practice

February 1980 Received license #1525 for the state of Oregon
May 12, 1980 began practice in Hermiston, OR

Continuing education:

In addition to meeting yearly CE for relicensure:

1990 completed 100-hour course in clinical nutrition (CCN)

1994-1996 completed 300-hour course in diagnosis and management
of internal disorders

1997 successfully passed diplomate examination (Diplomate of
American Board of Chiropractic Internists- DABCI)

2000 Certified in Clinical Thermography

2000- Present Neurofeedback EEG training and practice (Addendum)

2008-Present Board Certified BCN

2009 to 2013 600 hours of education in Chiropractic Neurology from
Carrick Institute of Post Graduate Education. Board Eligible

1) 150 Hours in Childhood Developmental Disorders

2) 300 Hours in General Neurology

3) 100 Hours in Movement Disorders
4) 150 Hours in Neuro Chemistry
2016/2017 Functional Neurology IAFNR
2016 16 hours Vestibular system
2017 16 hours Hypokinetic Movement Disorders
2012-2013 300-hour Fellowship in Integrative Cancer Therapy. Offered by
American Academy of Anti-Aging Medicine
September, 2013 Passed Fellowship Examination
June 2018 Passed CDC Heads up concussion online class for physicians

Research publications- Peer reviewed indexed journals

1995 Peterson KB. Two cases of spinal manipulation performed while the patient contemplated an associated stress event: the effect of the manipulation/contemplation on the serum cholesterol levels in the hypercholesterolemic subjects. Chiro Tech 1995;7:55-59.

1996 Peterson KB. A preliminary inquiry into manual muscle testing response in phobic and control subjects exposed to threatening stimuli. J Manipulative Physiol Ther 1996;19:310-316.

1997 Peterson KB. The effects of spinal manipulation on the intensity of emotional arousal in phobic subjects exposed to a threat stimulus: a randomized, controlled, double-blind clinical trial. J Manipulative Physiol Ther 1997;20:602-606.

2012 Peterson KB, Peterson CD. A case series evaluating the accuracy of manual muscle testing in predicting fetal sex. J Chiro Med 2012 Mar;11(1):1-6.

Professional Activities:

1987-1997 Board member Lassen Foundation, a research granting foundation, funding diet and nutritional research

1995-1997 Research Director ONE Foundation, a non profit organization that funds research into the emotional aspect of healing

Recognition and Lectures

1995 Commencement address UWS graduation
1997 “The four F’s of defense” Eagle’s Symposium: Golden, CO
1998 Doctor of the Year Award in recognition of research (ONE Foundation)
1999 “Pavlov and emotional arousal” (Eastern Washington Mental Health Therapist Association quarterly meeting)
2006 “Diagnosis and management of osteoporosis” Summer Symposium Council on Diagnosis and Internal Disorders Park City, UT
2008 “Biomarkers for cardiovascular risk analysis” (Summer Symposium Council on Diagnosis and Internal Disorders: Cincinnati Ohio)
2008 “Exploring the edge of perception: early results of a completed double blind research project” Eagles: San Diego, CA
2012 Fetal Sex paper delivered at Eagles, Half Moon Bay, CA.
2016 Eastern Washington Adoptive Mothers Support Group lecture: Brain development and attachment.
2018 Lecture at National Symposium on Cardiovascular health. “Early diagnosis of CVD” In Las Vegas, NV CDID.

Membership

American Chiropractic Association
Oregon Chiropractic Association
Council on Family Practice
International Association of Functional Neurology and Rehabilitation
International Society for Neurofeedback Research (SNR)

GILKER Heather * BCE

From: Kris Peterson <[REDACTED]>
Sent: Monday, February 28, 2022 1:37 PM
To: OBCE Oregon * BCE
Subject: Application for P&P Committee
Attachments: Curriculum Vitae.doc

Dear OBCE,

I am applying for the P&P committee.

I have been in continuous practice in a small town in Eastern Oregon since I passed the boards in 1980.

I bring not only over 40 years of experience but also a background in research publication and a wide range of professional education and certifications. I was previously a member of the thermography committee that met many years ago.

I have attached my CV.

Sincerely

Kristopher B Peterson, DC DABCI

GILKER Heather * BCE

From: Kathryn Ross <[REDACTED]>
Sent: Wednesday, March 09, 2022 9:26 PM
To: OBCE Oregon * BCE
Subject: P&P Committee Application
Attachments: K Ross cover letter P&P committee.docx; K Ross CV 3-22.doc

Hello,

I am interested in applying to be a part of the P&P committee for the OBCE.
I am attaching my resume and cover letter to this email. Please don't hesitate to contact me if you have any questions.
Looking forward to hearing from you soon.

Take care,

Kat Ross

Kathryn Ross, DC, CCSP

Attending Clinician/Clinical Educator, Campus Health Center
Health Centers of UWS

8000 NE Tillamook Street
Portland, Oregon 97213

Office phone # [REDACTED]

Fax # [REDACTED]

Email: [REDACTED] Web: <http://www.uws.edu>

UWS mission - To advance the science and art of integrated health care through excellence in education and patient care.

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Kathryn Ross DC, CCSP

[REDACTED], Portland, OR 97230 | [REDACTED] | [REDACTED]

March 7th, 2022

Oregon Board of Chiropractic Examiners
530 Center St NE, Suite 620
Salem, OR 97301

Dear Oregon Board of Chiropractic Examiners:

I am submitting my letter of interest in applying for the P & P advisory committee. I have over 10 years of experience as a practicing chiropractor and over 5 years of experience as a clinician and assistant professor at the University of Western States. With my experience in the field in combination with my education, I feel that I have a well-rounded background for this position.

I am most interested in a position on the P&P advisory committee because I genuinely enjoy researching and reviewing policies- so much so that my major for my undergraduate degree was in political science. I now focus my time and energy to help guide chiropractic interns to provide the most evidence-based and effective treatments for patients. Being able to help provide input to the board on different policies and procedures will meld my interests and I'd love to have the opportunity to give back and help move the profession forward in the state of Oregon.

Sincerely,

[REDACTED] 

Kathryn Ross, DC

KATHRYN M. ROSS, DC, CCSP

• Portland, OR 97230 •

EDUCATION

DOCTOR OF CHIROPRACTIC, CUM LAUDE (2009)

University of Western State

Portland, OR

Related Skills and Course Work: diversified adjusting, extremity adjusting, drop table, flexion-distraction, trigger point, pelvic blocking, McKenzie and Cox protocols, radiographic positioning and interpretation, PT modalities, rehabilitation protocols: spinal and all extremities

CERTIFIED CHIROPRACTIC SPORTS PHYSICIAN (CCSP®) (2020)

Portland, OR

Completed a minimum of 100 hours of post doctoral education in specialized sports medicine topics and passed a board examination.

BACHELOR OF ARTS (2006)

Gustavus Adolphus College

St. Peter, MN

Major: Political Science

Chiropractic Internship (2004) with Dr. Kevin Hardesty

PROFESSIONAL EXPERIENCE

UNIVERSITY OF WESTERN STATES

PORTLAND, OR

Clinical Educator and Assistant Professor, Dept of Clinical Education November 2016-Present

Responsible for supervising chiropractic interns in the Campus Health Center

Clinically examine, diagnose, treat and manage patient care for patients of all ages, with a focus on youth athletes

Head supervising clinician for off-site events including compassion clinics & migrant farm camps

Participate in formative and summative evaluations of clinical skills competencies

Instruct students and create daily case conferences using latest evidence for evaluation and treatment of patients

Serve on curriculum committee tasked to review curricular changes and updates, as well as the pre-clinical task force meeting working to create a bridge between pre-clinical and clinical skills departments

ENERGY IN MOTION CHIROPRACTIC, LLC.

PORTLAND, OR

Co-Owner, Located within Bloom Natural Health Care

January 2010-present

Clinically examine, diagnose, treat and manage patient care for patients of all ages, with

a focus on youth athletes until 2017

Self-employed chiropractor working in conjunction with other healthcare providers to offer an integrative approach to optimizing the patient's state of health until 2017

Scheduled patient's appointments, verified insurance benefits, performed insurance billing and patient collections

Currently mainly work on implementation of internal and external marketing programs for practice development and patient education as well as hiring, training, and managing front office staff

NORTHPOINTE GYMNASTICS

VANCOUVER, WA

Girls Competitive Team Coach

Oct 2020-current

TOP FLYTE GYMNASTICS

TROUTDALE, OR

Girls Competitive Team Director and Head Optional Team Coach

2009-April 2019

Managed 70+ team families yearly including: practice and competition scheduling, developing a competitive budget, communicating using an online application as well email and holding parent meetings

Management of competitive coaching staff: scheduling, education, holding meetings and trainings

Programmed training schedules for all competitive athletes

Design and order competitive uniforms for athletes and coaches

Development of warm-up routines, prehab, and conditioning plans focused on periodization and most recent research

Provide onsite medical care at Top Flyte hosted events

UNIVERSITY OF WESTERN STATES

PORTLAND, OR

Teaching Assistant, Clinic Phase 1-3

2010-2012

CERTIFICATIONS, ADDITIONAL ORGANIZATIONS & COURSES

- Fascial Movement Taping Level 1 & 2 Certified Rocktape provider
- Graston Certification (*Module 1*)
- Webster Technique Certification
- Gyrotonic Foundation Courses Certification
- Sports Medicine Intern (University of Western States 2008-09)
- USA Gymnastics professional member, Safesport certified
- CPR/AED/First Aid certification - current

* Letters of reference available upon request.



CHARLES ALFRED SIMPSON, D.C., D.A.B.C.O.

████████████████████
Cornelius, OR 97113
████████████████████
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PERSONAL BACKGROUND:

Born: ████████████████████
Colfax, Washington

EDUCATIONAL BACKGROUND:

1996	Certified Managed Care Executive, American Association of Health Plans
1990	Diplomate, American Board of Chiropractic Orthopedists
1978	Doctor of Chiropractic, University of Western States, Portland, Oregon
1970	Bachelor of Arts, Anthropology & English, Washington State University, Pullman, Washington

PROFESSIONAL BACKGROUND:

2019-	ACA Committee for Equity, Diversity, and Inclusion
2015-2022	Councilor, Council on Chiropractic Education
2006-2015	Fellow, Academy of Site Team Visitors, Council on Chiropractic Education
2015-	Senior Clinical Advisor, The CHP Group
2004-2015	Medical Director, Vice President, The CHP Group, Inc.
1996-2003	Member, Oregon Board of Chiropractic Examiners
2007-2018	Member Oregon Chiropractic Association
1991-2007	Member, Chiropractic Association of Oregon (CAO)
1994-	Member, American College Medical Quality
1991-	Fellow, Academy of Chiropractic Orthopedists
1989-	Member, American Chiropractic Association

CHIROPRACTIC LICENSE:

1978- Oregon #1421

CLINICAL AND CONSULTING PRACTICE:

1984- Chiropractic consultant, Cornelius, OR

1980-2003 Private practice, Cornelius, OR

1979-1980 Private practice, Salem, OR

RECENT PLATFORM & WEBINAR PRESENTATIONS:

- Cultural Competence for the Therapeutic Alliance 2021 The CHP Group
- Disparities in Chronic Pain Treatment ACA Webinar 2020
- Ethics and Evidence for Integrative Health Clinicians 2019 The CHP Group
- Ethics and Evidence 2018 ACA NCLC
- Ethics and Evidence Based Practice for Chiropractic Consultants ACCC/CFS/WHG Conference 2017
- Cultural Competence for Integrative Health Care Providers The CHP Group 2017
- Ethics and Professional Boundaries for Integrative Health Care Providers The CHP Group 2017
- Evidence Based Record Keeping for Chiropractic Practice The CHP Group 2016
- Evidence Based Treatment of WAD, Association of Chiropractic Consultants, 2015
- Integrative Medicine Treatment of Chronic Pain, Association of Chiropractic Consultants, 2015
- The Opioid Epidemic and Integrative Medicine, Oregon Association Of Health Underwriters, 2015
- ICD-10 Coding for CAM Practitioners 2013-15
- Electronic Medical Records for CAM Practitioners 2010

PUBLICATIONS:

Chapter co-author. "Standards of Practice in Third-Party Relations" in Chiropractic Standards of Practice and Quality of Care, Herbert J. Vear, D.C., Editor, Aspen Publications 1992.

"Integrating Chiropractic in Managed Care." Managed Care Quarterly. 1996; 4(1), 50-58.

Pursuing integration: a model of integrated delivery of complementary and alternative medicine. Topics in Clinical Chiropractic 2001; 8(2): 1-8.

Contributing author to 5 chapters in Integrating Complementary Medicine into Health Systems, Nancy Faass, Editor, Aspen Publishers, 2001.

Chapter author, "Complementary Medicine in Chronic Pain Treatment." Phys Med Rehabil Clin N Am; 17 (2006) 451-472.

Chapter author. "Complementary Medicine" in *Bonica's Management of Pain 4th Edition*. (2009)

Consultant on Complementary Medicine for the Substance Abuse and Mental Health Services Administration. *Managing Chronic Pain in Adults With or in Recovery From Substance Use Disorders. Treatment Improvement Protocol (TIP) Series 54*. HHS Publication No. (SMA) 12-4671. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2011.

Chapter author, "Complementary Medicine in Chronic Pain Treatment." Phys Med Rehabil Clin N Am; May 2015 Volume 26, Issue 2, Pages 321–347.

Chapter author. "Integrative Health" in *Bonica's Management of Pain, 5th Edition*. 2018

Revised February 2022

GILKER Heather * BCE

From: C Simpson <[REDACTED]>
Sent: Monday, February 28, 2022 2:06 PM
To: OBCE Oregon * BCE
Subject: P&P Committee Application
Attachments: P&P Cover letter.pdf; C Simpson CV Complete 2.2022 photo.pdf

Dear OBCE

Please see attached cover letter and CV.


Thank you for considering my application.

--

Charles A. Simpson, DC, DABCO

Pronouns: he, his

Charles A. Simpson, Dc


Cornelius, OR 97113

Oregon Board of Chiropractic Examiners
530 Center St NE, Suite 620
Salem, OR 97301

Re: P & P Committee

Dear OBCE,


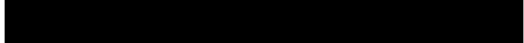
Attached is my current CV for your consideration. I am applying to help the committee's work as mentioned in your recent email. I believe that I have the experience, history with the profession, and understanding of the purpose of the P&P Guide to contribute to this work.

Thank you.

Charles A. Simpson

Att: Curriculum vitae

Dr. Christopher Stewart, DC


Portland, Oregon 97231



March 3, 2022

Oregon Board of Chiropractic Examiners
530 Center Street NE
Suite 620
Salem, OR 97301

Hello,

I am writing to express interest in OBCE's Policy & Practice Committee. I am an actively licensed Oregon DC and PhD student attending Saybrook University. I practice out of a small clinic in Oak Grove, Oregon. I am also in the beginning stages of writing my dissertation.

As an Oregon Chiropractor, I enjoy one of the most liberal scopes of practice within the United States. I very much appreciate that the OBCE is forming this committee, and that it is concerned with nurturing the chiropractic profession in Oregon to be the most informed and evidence-based.

What I bring to the committee will be the insight of a chiropractic physician who has practiced in various clinical formats, with various modalities, in two states – as well as the insights gained from my studies as a Mind-Body Medicine PhD student focused on the biopsychosocial model of healthcare. I am confident that this insight and my experience navigating research literature will be an asset to the committee.

I appreciate your consideration.

Warmly,



Christopher Stewart, DC



Dr. Christopher Stewart, DC

Contact

16005 NW Skyline Blvd
Portland, OR 97231



Profile

As a chiropractic physician and PhD student in Mind-Body Medicine, I am an evidence-based practitioner and lifelong learner who embraces academia and research. I am passionate about helping my patients feel better and better understand the holistic inter-connections within our bodies, and to the external world.

Education & Research

PhD in Mind-body Medicine (in progress)

Saybrook University | August 2018 - present

Doctor of Chiropractic Medicine

University of Western States | September 2017

BS in Human Anatomy

University of Western States | March 2016

BA in Psychology

University of Western States | May 2013

Perception, Action & Cognition in Mediated, Artificial, & Natural Environments Lab

Research Assistant; Advisor: Dr. Igor Dolgov
New Mexico State University | September 2011 - May 2013

Additional Training

- Mind-Body Medicine
- Digital Radiography
- Clinical Hypnosis
- Pain Management
- Nutrition
- Functional Medicine
- Ayurvedic Medicine
- Energy Medicine
- Business Management
- Cultural Competency
- Ethics
- Sexual Harassment
- Domestic Violence
- Creative Writing

Licensure & Certifications

Oregon DC Lic #5857 | 10/2017 - Present

Arizona DC Lic #8870 | 12/2019 - 12/2020

Arizona PMMTP certification #5426 | 12/2019 - 12/2020

Career Path

Chiropractic Physician and Owner

Acorn Wellness, Oak Grove, OR | April 2021 - Present

Chiropractic Physician

The Joint Corp, Tempe, AZ | January 2020 - April 2020

Chiropractic Physician and Owner/Partner

Mind & Body Wellness of Beaverton, Beaverton, OR | October 2018 - July 2019

Chiropractic Physician

The Wellness Center PDX, Portland, OR | September 2017 - September 2018

Chiropractic Intern

The Wellness Center PDX, Portland, OR | July 2017 - September 2017

Student Tutor - Gross Anatomy Lab I-IV; Clinical Microbiology

University of Western States, Portland, OR | September 2015 - December 2017

GILKER Heather * BCE

From: Christopher Stewart <[REDACTED]>
Sent: Thursday, March 03, 2022 5:26 PM
To: OBCE Oregon * BCE
Subject: Policy and Practice Committee
Attachments: Dr_Stewart_Resume.pdf

Hello,

Attached are my resume and cover letter for your consideration.

Thank you,

Christopher Stewart, DC

Scott Roland Swanson DC

[REDACTED]
San Francisco, CA 94115
[REDACTED]
[REDACTED]

Summary: Seasoned and skilled chiropractor in numerous settings, able to adapt to various business structures and models. Experienced in multiple modalities and care coordination. Focused on emerging and consistent developments in chiropractic theory and application, providing leadership and mentoring at the practical and organizational level. Proficient in organizational and legal process adherence and organizational clinical teamwork to achieve and deliver measurable best-in-class care. Major focus on patient communication and satisfaction.

Skills: Communicates effectively and closely with primary medical staff and ancillary health professionals to coordinate care for the management of musculoskeletal conditions. Uses evidence-based outcomes to measure and evaluate effectiveness, necessity, efficacy, and quality of services provided and modify services as needed. Provides full scope of chiropractic skills including physical examination, diagnosis, and treatment of the spine and extremities. Determines best practices and approaches using diagnostic tests, performing and interpreting radiographs, spinal manipulations, extremity manipulation, soft tissue manipulation, rehabilitative exercise, and use of therapeutic taping, ultrasound, laser, shockwave, and electronic muscle stimulation modalities. Proficient with EMR software including Epic and Nextgen; experienced with FOTO outcome measures software.

EXPERIENCE:

April 2021 - Current

Associate Professor: Palmer College of Chiropractic West, 90 East Tasman Drive, San Jose, CA 95134.

Developing and delivering lesson plans, lecturing, and teaching labs in multiple areas of expertise; including cervical spine and upper extremity evaluation and management, chiropractic analysis and technique, marketing, business, and life skills. Developing and preparing students at the doctoral level as clinicians providing best-in-class care. Supervising, advising, and mentoring teaching assistants. Participating in faculty and departmental meetings, including driving process and practice improvements based on industry and practical experience. Managing virtual and in-person instruction.

November 2016 to December 2020

Chiropractor: Premise Health PG&E Health Center, 77 Beale Street 3rd Floor, San Francisco, California 94105

Access, treat and manage care for PG&E employees onsite. Collaborate with primary care MD, physical therapist, acupuncture, EAP, and health coach to manage patient conditions. Responsible for the set up of equipment in the physical medicine area and ordering of equipment during the opening of the clinic. Facilitate team-building activities once per quarter. Established onsite physical medicine “quick screen” program and other marketing events such as back care webinars and employee newsletter articles. Evaluated clinic’s adherence to metrics on Quality Management and Improvement section of AAAHC accreditation document.

Selected for Premise Champion program. A company-wide program to recognize leaders in service lines. Responsibilities include being a site-level mentor, a mentor to newly opened sites (Warner Media NY), assisting the clinical support team with streamlining policies and procedures, and attending and presenting at monthly champion calls.

October 2004 to November 2019

Chiropractor; Private Practice, 155 Valencia St., San Francisco California 94103.

Management of chiropractic facilities with employees. Responsible for all aspects of the office including insurance billing, community-based health education, and health promotion. Responsible for all aspects of delivering and coordinating patient care.

September 2007 to October 2017

Chiropractor; US Healthworks Medical Group, 2850 Seventh Street Berkeley, California 94170.

Uses appropriate evidence-based treatment/disease management protocols and works with the primary care team and other medical ancillary services to coordinate care all aspects of evaluating, diagnosing, and treating patients after a referral from medical doctor, performing routine manipulative procedures of the spine, managing neuro-musculoskeletal conditions and extremity conditions related to spinal pathology. Communicate regularly with medical staff and other ancillary providers (acupuncture, physical therapist, physician assistants) regarding patient treatment plans and progress.

Routinely prepares documentation to meet established standards of the medical treatment facility.

January 2003 to August 2004

Chiropractic Associate, Graham Rehabilitation and Wellness Center, 816 First Avenue, Seattle WA, 98104.

Responsible for physical examinations and co-treatment of patients with neuromusculoskeletal disorders with a primary doctor. Take and analyze radiographs. Assist in Management and supervision of employees and other business office operations.

FORMAL EDUCATION:

Doctor of Chiropractic Degree, Palmer College of Chiropractic West, San Jose, California, June 2002

B.S. Degree in Psychology, Portland State University, Portland Oregon, June 1998

LICENSES/CERTIFICATES:

Valid Active License, Board of Chiropractic Examiners State of California

American Heart Association CPR Certified

Valid Inactive License, Oregon Board of Chiropractic Examiners

Radiography Operator and Supervisor License, State of California Department of Health Services

Certified Chiropractic Extremity Practitioner, Council on Extremity Adjusting

AWARDS:

Palmer College of Chiropractic West, Service Award, June 2002

California Chiropractic Association, Service Award

GILKER Heather * BCE

From: Scott R. Swanson [REDACTED] >
Sent: Tuesday, February 15, 2022 1:38 PM
To: OBCE Oregon * BCE
Subject: Application for committee
Attachments: CV2021 (2).pdf

Scott Swanson DC
[REDACTED]
San Francisco CA, 94115
[REDACTED]

Dear Oregon Board of Chiropractic Examiners,

I am an experienced and dedicated chiropractor who has been practicing in various settings since 2002. I would like to express interest in joining your committee reviewing evidence for procedures and techniques. I apologize I cannot seem to find the email listing the exact name of the committee. I believe my current position in academia gives me unique strengths and resources to be a valuable member of the committee.

My CV, which is enclosed, contains additional information about my experience and skills. I can be reached via my cell phone [REDACTED] or email.

Thank you for your time and consideration.

Scott Swanson DC

Susan M. Yazvac, DC, DACBR

████████████████████

████████████████

PROFESSIONAL HISTORY

2018 - 2020	Vice President, Council on Diagnostic Imaging (CDI)
2008 - 2019	Associate Professor, Palmer College of Chiropractic-Florida
2006 - 2008	Assistant Lecturer, Anglo-European Chiropractic College, Bournemouth, England
1987 - 2006	NW Radiological Consulting; private practice; Portland, Oregon
2000 - 2003	Private clinical practice - proctology
2000 - 2006	EPIC Imaging East & West, Portland, Oregon
2003	Radiological Consultant to Olympia Open MRI Center, Lacey, Washington
1988 – 2006	Supervisor NE Clinic, Joseph A. Cimino DC, PC, & Associates, Portland, Oregon
1997 – 2000	Outpatient Radiology Center, Portland, Oregon
1998 – 2000	Body Imaging Radiology Center, Portland, Oregon
1993 – 1997	Past President / President, Oregon X-Ray Council – providing continuing education in radiology
1993 – 1997	Oregon Board of Chiropractic Examiners – exam committee
1992 – 1993	Assistant Professor, Radiology, Western States Chiropractic College, Portland, Oregon
1985 – 1986	Assistant Professor, Radiology, Western States Chiropractic College, Portland, Oregon
1983 – 1985	Radiology Resident, Western States Chiropractic College, Portland, Oregon
1981 – 1983	Private Chiropractic Practice, Hermitage, Pennsylvania

CURRENT / RECENT PROFESSIONAL EXPERIENCE augmented

**VICE-PRESIDENT of the COUNCIL ON DIAGNOSTIC IMAGING
AMERICAN CHIROPRACTIC ASSOCIATION**

2018-2020

- Represented CDI at the National Chiropractic Leadership Conference: focused on the profession meeting the highest standards of evidence based practice
- Updated and designed the www.CDItoday.org website
- Updated bylaws
- Create agendas for monthly meetings and preside as director of meetings
- Co-organize annual conferences

Susan M. Yazvac, DC, DACBR

ASSOCIATE PROFESSOR

2008-2019

PALMER COLLEGE OF CHIROPRACTIC FLORIDA 4777 CITY CENTER PARKWAY, PORT ORANGE, FL 32129

- Responsible for the development of the radiology program and courses
- Lead professor of musculoskeletal radiology
- Challenged and motivated students through in-depth lectures and discussions
- Taught, supervised and evaluated students for radiology interpretation competency
- Created and published a series of radiology books for student use
- Developed and taught courses and seminars in radiology
- Developed and delivered National Board Chiropractic Examination reviews
- Developed and delivered Objective Structured Clinical Exams (OSCE) reviews

ASSISTANT LECTURER

2006-2008

ANGLO-EUROPEAN CHIROPRACTIC COLLEGE

BOURNEMOUTH, ENGLAND

- Lead lecturer Investigative Imaging I
- Assistant lecturer Investigative Imaging II
- Supervised clinical experience in reading practicum and student teaching
- Clinical radiologist
- Clinical chiropractic tutor
- Coordinated candidate assessment
- Participated on the exam committee to create OSCEs for clinical entrance and exit exams

POSTGRADUATE LECTURING

2019	Council on Diagnostic Imaging, Phoenix, Arizona
2018	Council on Diagnostic Imaging, Cincinnati, Ohio
2017	Council on Diagnostic Imaging, Tampa, Florida
2016	Council on Diagnostic Imaging, Cincinnati, Ohio
2015	Council on Diagnostic Imaging, Portland, Oregon
2009 -current	National Board Reviews, Port Orange, Florida
2008	Palmer Chiropractic College Florida – Homecoming, Port Orange, Florida
2007	British Chiropractic Association Annual Conference, Bournemouth, UK
2003	In-Phase Radiology Seminar, Portland, Oregon
1983 -1997	Oregon X-Ray Council, Oregon
1989	Oregon Chiropractic Physician Association, Portland, Oregon
1988	Chiropractic Society of Oregon, Portland, Oregon
1990, 1989	Clark County Chiropractic Association, Vancouver, Washington
1983	American College of Chiropractic Radiology Symposium

Susan M. Yazvac, DC, DACBR



LEADERSHIP and COMMITTEE POSITIONS

- ☐ National Chiropractic Leadership Conference / Council on Diagnostic Imaging
- ☐ Acting President, ACA Council on Diagnostic Imaging
- ☐ Academic Standing Committee, Palmer College of Chiropractic-Florida
- ☐ Curriculum Management Committee, Palmer College of Chiropractic-Florida
- ☐ Development of radiology curriculum, Palmer College of Chiropractic-Florida

EDUCATIONAL BACKGROUND

2017	Certification Herbal Medicine, Chestnut School of Medicine
2000	Certification Minor Surgery, Proctology
1987	Diplomate, American Chiropractic Board of Radiology
1985	Radiology Resident, Western States Chiropractic College, Portland, Oregon
1981	Doctor of Chiropractic, Palmer College of Chiropractic, Davenport, Iowa
1978	Pre-Medical Associate Degree, Youngstown State University, Youngstown, Ohio

PAST PROFESSIONAL AFFILIATIONS

- ☐ American Chiropractic Association
- ☐ Council on Diagnostic Imaging
- ☐ American Chiropractic Board of Radiology
- ☐ British Chiropractic Council

GILKER Heather * BCE

From: Susan Yazvac [REDACTED] >
Sent: Monday, February 21, 2022 8:03 PM
To: OBCE Oregon * BCE
Subject: Application P&P Committee.Dr Yazvac
Attachments: OBCE.P&PCommittee.Yazvac.pdf; 2022 CV.Yazvac.pdf

Attached are my cover letter and CV as requested for the application for participation in the P & P Committee.

Thank you for your consideration.
Dr. Yazvac

Oregon Board of Chiropractic Examiners

I am applying to participate in the Policy & Practice Committee in an advisory capacity.

I have an active Oregon license since 1984. I practiced as a radiologist at several medical facilities in the Portland area as well as my private radiology consulting practice. My private chiropractic practice also provided proctological services.

In addition, I have had many years in academia at the University of Western States, the Anglo-European Chiropractic College, and Palmer College of Chiropractic - Florida.

Attached is my CV for your consideration.

It would be an honor to serve the board during this process.

Regards,

Susan M. Yazvac, DC, DACBR

Chien-Ching Yu

[REDACTED]
Lake Oswego, OR 97035

T: [REDACTED]
[REDACTED]

Education

- 1995-2002 Doctor of Medicine
China Medical University-Taichung city, Taiwan
- 2013-2017 Doctor of Chiropractic, *summa cum laude*
University of Western States-Portland, OR

Experience

- 2004-2005 Veteran General Hospital Taipei, Taiwan
Surgical residentship
• General surgical residentship, cardiology surgery, and plastic surgery residentship
- 2006-2009 Chung-Shan Medical University Hospital Taichung city, Taiwan
Physical Medicine & Rehabilitation residentship
*clinical rehabilitation care
*electrophysiology test(NCV & EMG),muscular sonography, Exercise test, pulmonary function test
- 2009-2010 Bodhi Hospital Taichung, Taiwan
Director of Department of Physical Medicine & Rehabilitation
- 2010-2010 Cheng Ching Rehabilitation Hospital. Taichung, Taiwan
Director of Department of Physical Medicine & Rehabilitation
- 2010-2013 Lin Shin Hospital Taichung, Taiwan
Attending Physician, Department of Physical Medicine & Rehabilitation
- 2017-2018 Dynamic Chiropractic & Sports Rehab Portland, U.S.A.
The Owner
- 2018-present Dr. Yu Integrative Chiropractic, P.C.
The Owner
- 2020-present **Reviewer of American Journal of Physical Medicine & Rehabilitation**

Membership

- American Academy of Physical Medicine and Rehabilitation
- Association of Academic Physiatrists
- Taiwan Academy of Physical Medicine and Rehabilitation
- Taiwan Society of Ultrasound in Medicine
- Taiwan Pain Society

Publication

- **Yu Chien-Ching**, Shih Ying-Ju, Tsai Su-Ju. Femoral nerve injury following transfemoral angiography: A case report. Tw J Phys Med Rehabil 2008;36(4): 227-34

Conferences

- Speaker of The American Academy of Physical Medicine and Rehabilitation Annual Assembly 2020
Session: Transforming Alternative to Integrative through Team-Based Chronic Pain Care
Thursday November 12, 2020 8:00 AM – 11:00 AM

GILKER Heather * BCE

From: yu chienching <[REDACTED]>
Sent: Thursday, March 10, 2022 8:33 PM
To: OBCE Oregon * BCE
Subject: P&P Committee Opportunity
Attachments: Oregon Chien-Ching Yu's Cover Letter.pdf; Dr. Chien-Ching Yu's resume-OR.pdf

Hello,

I am interested in the P&P committee opportunity. The attachments are the cover letter and my resume. Please let me know if you have any questions. Thank you.

Regards,
Dr. Chien Ching Yu



www.dryuintegrativechiropractic.com

<https://www.facebook.com/DrYuIntegrativeChiro/>

39355 California St, Ste 110, Fremont, CA 94538 | (510) 766-2618

4145 SW Watson Ave, Ste 350, Beaverton, OR 97005 | (971) 319-5695

Confidential Communication:

This email message and any attachments are intended only for the addressee. This email and any attachments may be privileged, confidential, and protected from disclosure. If you are not the intended recipient, any dissemination, distribution, or copying is expressly prohibited. If you received this email message in error, please notify the sender immediately by replying to this email message or by telephone.

Chien-Ching Yu, D.C., M.D.

[REDACTED], Lake Oswego, OR
[REDACTED]
[REDACTED]

To Whom It May Concern,

I am writing to you to express my interest in the position of a member of a committee established by the OBCE to review, research, update, modernize, and make revision recommendations to the Board. What interested me in this position was the opportunity to work with other chiropractors to do evidence based research to update the Policy & Practice.

I have been practicing at my own clinics in the Oregon and California for the past four years. In my practice, I always search update research to support my diagnoses, treatment skills, and using physical modalities.

My double degrees and background as a physiatrist in Taiwan and a chiropractor in US have taught me how to quickly and accurately diagnose and treat patients with evidence based medicine. To stay informed and keep my practice up to date, I frequently read papers from recent medical journals. I work using a problem-oriented and patient-centered approach with evidence-based intervention.

In addition to the clinical jobs, I was invited to be a speaker at the American Academy of Physical Medicine and Rehabilitation Annual Assembly last year where I spoke about team-based care for jaw pain. I have also been a reviewer of the American Journal of Physical Medicine & Rehabilitation since 2020. I would embrace the opportunity to be a team member promoting chiropractic health care.

Thank you for your time and consideration and I look forward to speaking with you in the near future.

Sincerely,
Chien-Ching Yu, D.C., M.D,

PURNELL Mackenzie G * BCE

From: PURNELL Mackenzie G * BCE
Sent: Wednesday, May 04, 2022 7:44 AM
To: PURNELL Mackenzie G * BCE
Subject: comment from DC

From: Karen Baranick [REDACTED] >
Sent: Friday, April 29, 2022 9:51 AM
To: MCLEOD-SKINNER Cass * BCE <Cass.MCLEOD-SKINNER@obce.oregon.gov>
Subject: comment from DC

Hey Cass,

I got this comment messaged to me on Facebook and thought I would send it to you so all the board members might see it in the upcoming meeting materials.

"Karen, If you have a minute I would like to ask you a question.

We are following the masking guidelines but it is causing conflict between patients and our clinic. The last two years have been difficult due to covid and now having patients wear masks is causing conflict and again hurting our business. I watched the OHA video conference and the reason they are keeping masks for healthcare providers is that healthcare providers "treat Covid patients". I do not treat Covid patients as well as the vast majority of chiropractors. Is the upcoming board meeting trying to make masks permanent? From Guidelines to Rules? We screen patients and don't let them come if they covid or covid like symptoms. The OHA definition implies doctors are treating covid patients, just like the OHA video teleconference. It also states that if the doctor has covid they can treat covid patients. That doesn't happen in our clinic. I don't know of many clinics actively treating covid patients, but if there is a clinic that treats covid patients can't they "opt-in" to follow the masking rules, and the clinics that do not treat covid patients "opt-out"? "Consistent masking by health care providers in health care settings, as well as masking by visitors and patients provides protection to health care providers and to the people they care for. Masks act as source control if the provider has COVID-19 and provide a protective effect if a patient has COVID-19."

Thank you for your time,"

This was my reply:

"Thanks for the comment. I am forwarding it to the executive director so it can be added to the comments all board members get before the meeting so we can discuss them. While our clinic also does not treat COVID patients, we still want to be considered healthcare professionals and not a spa. I do see your point, and I am tired of the masks as well and the battle that seems to come with keeping them, but the role of the board is not to advocate against following or to try and change OHA guidelines - that is more the role of the OCA. Like I said though, I would like the other board members to read your message because it is a rational argument and you are not alone in your feelings. I will keep it anonymous unless you want them to know where the message came from. Thanks again for reaching out."

Hopefully that was an ok way to respond.

Thanks,

--

Karen Baranick, DC
Milwaukie Spine and Sport, LLC
2100 SE Lake Road

Suite 1

Milwaukie, OR 97222



www.MilwaukieSpineAndSport.com



"Love the Way You Move"

Chapters 1-3 are final and Ch. 4-6 are still under review.

TABLE OF CONTENTS

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INTRODUCTION

The Oregon Chiropractic Practice and Utilization Guidelines (OCPUG)

This document was first published in 1991 by the Oregon Board of Chiropractic Examiners (OBCE or Board) with the goal of outlining a healthcare resource for Oregon chiropractic physicians. This document has undergone several iterations to reflect emerging research and clinical experience in the hopes that it would continue to become a more useful tool for practitioners. The OBCE will continue to review and update this document for this purpose. This resource is not designed to cover the complete scope of chiropractic practice in Oregon, nor is it directed at any other individual or group besides Oregon licensed chiropractic physicians and those who practice under their supervision.

ACKNOWLEDGMENTS

The OBCE expresses sincere gratitude to the following individuals who have been instrumental over the years in helping to author and revise this document through cooperation, research, and debate:

Scott Abrahamson, DC	Larry Hanberg, DC	William McIlvaine, DC	Michael Vissers, DC
Michael Burke, DC	Mitchell Hass, DC	Daniel Miller, DC	Arthur Walker, DC
John Colwell, DC	Charles Hathaway, DC	Craig Morris, DC	J-P Whitmire, DC
Steven Cranford, DC	Janis Isselman, DC	Mitzi Naucner, JD	Michael Whitton, DC
Kimberly DeAlto, DC	Allen Knecht, DC	Steven Oliver, DC	Gary Zimmerman, DC
Douglas Dick	Lester Lamm, DC	Elizabeth Olsen, DC	
David Duemling, DC	Michael G. Lang, DC	David Peterson, DC	
Steven Gardner, DC	Jeannette Launer, JD	Joseph Pfeifer, DC	
Meridel Gatterman, DC	Anthony Marrone, DC	Ron Romanick, DC	
Richard Gorman, DC	Joyce McClure, DC	LaVerne Saboe, Jr., DC	
Dominga Guerrero, DC	Bonnie McDowell, RPT, DC	Edmonde Samuel, DC	

In addition, thank you to the authors and researchers of all the source materials referenced in this document.

CHAPTER I

GOALS AND OBJECTIVES FOR CLINICAL PRACTICE

As a primary health care provider and as a portal of entry to the health delivery system, an Oregon chiropractic physician is led by these goals to accomplish their associated objectives.

I. Therapeutic Relationship

A. GOAL: Establish a professional doctor-patient relationship with the individual seeking care and appropriately triage their health issue(s) as well as their complaint(s) being presented.

B. OBJECTIVES:

1. Establish rapport in an atmosphere of physical comfort conducive to information gathering.
2. Provide for the presence of a third party, as required, to assist or observe in recording information, allaying apprehension, or other circumstances.
3. Elicit a thorough case history through written and/or oral means and provide a permanent record of findings with due regard for a patient's ethnic, cultural, or linguistic background.
4. Include within each case history, chief complaint, present health and relevant past health, including history of injury, disability, and cognitive assessment.
5. Assess the reliability of information presented.

II. Examination

A. GOAL: Provide such examination and diagnostic procedures and/or refer for additional diagnosis and management, as indicated by clinical relevance.

B. OBJECTIVES:

1. Specify which examination and diagnostic procedures are pertinent to the patient's complaint and present condition of health or past health issue.
2. Perform such examination and diagnostic procedures within statutory scope of practice and clinic capabilities, consistent with efficient exploration of the condition presented.
3. Assess the sensitivity, specificity, and predictive value of examination procedures selected.
4. Conduct examination and diagnostic procedures in an objective manner, remaining impartial with respect to etiology and extent of condition.
5. If referring for outside examination or diagnostic procedures, explain the clinical relevance and justification for additional testing to the patient.

Chapters 1-3 are final and Ch. 4-6 are still under review.

6. Assess historical and physical data to identify relative or absolute contraindications for chiropractic care.
7. If referring to another health care provider, include relevant information pertaining to the referral and document such referral made.
8. Accurately record examination findings in the patient's case file consistent with universal health standards, administrative rules, and statutes.

III. Diagnosis

A. GOAL: Arrive at provisional diagnoses or clinical impressions consistent with the presenting complaint(s) and the results of examination and diagnostic procedures conducted.

B. OBJECTIVES:

1. Gather and interpret the results of all examination and diagnostic procedures, differentiating between normal and abnormal findings, and determine the relevance of the presenting complaint(s).
2. Determine subsequent evaluation procedures appropriate to the continued investigation of the patient's condition and establish a clinical impression or diagnosis.
3. Rule in or rule out the pathophysiological processes responsible for the patient's presenting complaint(s).
4. Record objectively supported differential diagnoses or clinical impressions, complicating factors and/or concomitant conditions using scientifically and/or clinically sound diagnostic procedures and language.

IV. Prognosis and Decision to Treat and/or Refer

A. GOAL:

1. Provide patient with PARQ.
2. Arrive at an initial prognosis and determine whether to accept the patient for chiropractic care and/or refer to another health care provider.

B. OBJECTIVES:

1. Determine the patient's initial prognosis.
2. Determine whether the condition is amenable to chiropractic care and is within the scope of chiropractic practice. Provide patient with report of findings.
3. If any portion of the patient's condition is not treatable within the scope of chiropractic practice, refer to the appropriate health care provider, forwarding any diagnostic tests or relevant information in an expedient manner. Document the referral.

V. Treatment Plan

A. GOAL: Generate an appropriate treatment plan with recommended re-evaluation dates.

B. OBJECTIVES:

1. Provide a treatment plan including procedures and modalities consistent with accepted standards of practice.
2. Record and date the treatment plan, including expected length and intensity of treatment, and projected re-evaluation dates.
3. If there are any general or specific considerations or contraindications for care, note them in the case file, modify the plan appropriately, and/or refer the patient to another provider.
4. Provide the patient with report of findings and with a PARQ. Obtain and record informed consent from the patient.
5. Records should be in a format that permits interpretation by other health care providers.

VI. Monitoring

A. GOAL: Assess the effectiveness of the treatment and make appropriate amendments to the treatment plan to provide efficacious care for the presenting complaint(s).

B. OBJECTIVES:

1. Perform ongoing assessment of both subjective and objective findings, documenting them in the patient record.
2. Initiate an appropriate re-evaluation to account for exacerbations, aggravations, waxing or waning of a chronic condition, or re-injury.
3. Evaluate new objective findings, integrating them with historical data, modify diagnoses and treatment appropriately, including a potential referral to a different discipline to provide timely, efficacious, and continuous care.
4. Generate reports of the patient's current condition that include information in a format a third-party representative will be able to clearly understand. Include clinical impression and treatment or modified treatment plan so that decision-making on authorization of services will be appropriate and timely.

VII. Discharge

A. GOAL: Decide on the appropriate discontinuation of care either at the endpoint of treatment or when no further improvement in the patient's condition can reasonably be expected. This responsibility includes the determination of follow-up care when necessary.

B. OBJECTIVES:

1. Release the patient from curative care:
 - a. At the request of the patient;
 - b. Patient non-compliance;
 - c. When the objectives of the treatment plan have been achieved; or

Chapters 1-3 are final and Ch. 4-6 are still under review.

- d. When patient has achieved maximum medical improvement.
- 2. Document the necessity of follow-up care and inform the patient and any necessary ancillary personnel.

CHAPTER II

CHIROPRACTIC CLINICAL APPLICATION, DIAGNOSIS, AND TREATMENT PROCEDURES

SEQUENCE OF CLINICAL APPLICATION

The methods for appropriate clinical decision-making must be consistent with primary health care provisions and portal of entry procedures and standards. Each step taken in reaching a clinical impression provides an opportunity for the chiropractic physician to decide to continue further, refer the patient to another provider, or obtain a second opinion. The following is a general sequence of procedures that is commonly followed by the chiropractic physician. It is intended as a guideline, not as an exhaustive list.

- I. Intake Interview of Patient
 - A. History of presenting illness
 - B. Past medical history
 - C. Family medical history
 - D. Personal, social, and socio-economic history
- II. Examination and Diagnostic Procedures
 - A. Physical examination
 - 1. General
 - 2. Specific to the presenting complaint(s)
 - 3. Chiropractic examination of spine and extremities
 - B. Psycho-social assessment
 - C. Laboratory examination (ordered or performed when clinically indicated)
 - D. Diagnostic imaging (ordered or performed when clinically indicated)
 - E. Special examinations (ordered or performed when clinically indicated)
 - 1. Gynecological examination
 - 2. Proctological examination
 - 3. Obstetrical examination
 - 4. Minor surgical examination
 - 5. Electrodiagnostic evaluation
 - 6. Vascular evaluation
- III. Diagnostic and/or Clinical Impression
- IV. Prognosis and Decision to Treat and/or Refer
- V. Chiropractic Therapeutic Care and Patient Management
- VI. Re-evaluation and Appropriate Modification of the Diagnostic Impression and Treatment Plan (if indicated)
- VII. Conclusion of Treatment

CHIROPRACTIC DIAGNOSTIC PROCEDURES

I. History

A necessary component of clinical fact-finding through subjective offerings by the patient. The history may include, but is not limited to, the following:

- A. Presenting condition
 - 1. Location
 - 2. Chronology
 - 3. Quality
 - 4. Severity
 - 5. Setting (circumstances)
 - 6. Modifying factors
 - 7. Associated symptoms (review of systems)
 - 8. Prior treatment(s)
 - B. Past medical history
 - 1. Accidents and injuries
 - 2. Previous illnesses
 - 3. Surgeries
 - 4. Medications
 - C. Family medical history
 - 1. Parents
 - 2. Grandparents
 - 3. Siblings
 - D. Personal, social, and socio-economic history
 - 1. Description of job
 - 2. Exercise
 - 3. Diet
 - 4. Habits/hobbies
- II. Examination and Diagnostic Procedures
- A. Psycho-social assessment
 - B. Physical examination shall include:
 - 1. Vitals, including but not limited to height, weight, blood pressure, and pulse
 - 2. Examination specific to presenting complaint(s)
 - C. Physical examination, when clinically indicated, may also include, but not be limited to:
 - 1. Heart, lungs, and abdomen
 - 2. EENT
 - 3. Integumentary examination
 - 4. Orthopedic and neurological tests
 - 5. Static and motion palpation of the spine and/or extremities
 - 6. Postural analysis
 - 7. Muscle testing including dynamic, isokinetic, static, and/or manual analysis
 - D. Laboratory examination
 - 1. Clinical laboratory testing may be necessary when the history and/or other examination findings indicate, including but not limited to blood, urine, saliva, hair, mucus, or stool.
 - 2. Biopsies of superficial structures may also be performed with additional Oregon minor surgery certification.

E. Diagnostic imaging

While diagnostic imaging procedures may be vital to diagnosis and case management, the decision to use any diagnostic imaging procedure should be based on clinical necessity following an adequate case history and physical examination.

F. Special examinations/evaluations

1. Gynecological examination
2. Proctological examination
3. Obstetrical examination
4. Minor surgical evaluation
5. Electrodiagnostic evaluation
6. Vascular evaluation
7. Laboratory evaluation
8. Diagnostic imaging evaluation

G. Other clinically indicated examination/evaluation procedures that comply with the OBCE rules.

III. Diagnosis and/or clinical impression

- A. Severity
- B. Acute vs. chronic
- C. Location of lesion and/or disease
- D. Etiology
- E. Complicating factors
- F. Concomitant conditions

IV. Prognosis and decision to treat and/or refer

The decision to treat and/or refer is made after appropriate examination and a differential diagnosis has been established. Consideration of the contraindications to the proposed treatment should be taken at this time as well as consideration of consultation and/or acquiring a second opinion.

When possible and/or appropriate, a prognosis should be given at the time that a diagnosis is made. The prognosis may change as the condition of the patient and the response to treatment changes. A referral to a different healthcare provider or discipline is appropriate when clinically indicated.

CHIROPRACTIC THERAPEUTIC CARE AND PATIENT MANAGEMENT

A. Manual therapy

1. Adjustment
2. Manipulation
3. Mobilization
4. Soft tissue manipulation

B. Physiological therapeutics

1. Heat and/or cold
2. Hydrotherapy
3. Electrotherapy
4. Phototherapy
5. Mechanotherapy

Chapters 1-3 are final and Ch. 4-6 are still under review.

- 6. Therapeutic and/or rehabilitation exercise
 - 7. Orthotics
 - 8. Bracing and taping
- C. Nutritional supplementation, recommendations, and/or over the counter medications
- D. Counseling within chiropractic scope of practice
- E. Treatment in special areas
 - 1. Gynecology
 - 2. Obstetrics
 - 3. Proctology
 - 4. Minor surgery
- V. Re-evaluation and assessment
- VI. Conclusion of Treatment

CHAPTER III

RECORD KEEPING AND REPORT WRITING

The quality of a physician's ability to provide efficacious health care is dependent on their ability to gather, organize, analyze, and make decisions on clinical data. Good decisions are the result of accurate and complete facts being retrievable from a patient's records.

Therefore, documentation of the patient's medical history, presenting complaint(s), progression of care, diagnosis, prognosis, and treatment plan should be reflected in the record keeping and written reports of the patient file. Some aspects of this file have been included in Chapter I. Components of this file should include:

I. Patient History and Examination Records

There is considerable variation in how physicians develop and record a clinical history and examination findings. The reader is referred to Chapter I, Sections I and II for a summary of the suggested guidelines.

II. Chart Notes

Chart notes should be recorded at each visit in a form which may be understood by any medical/healthcare provider. While the patient's history indicates their status at the time of the initial visit or at the onset of a new condition, the progress record (often called chart notes) reflects the patient's state of health at subsequent points of time.

The minimum acceptable records should create a story of the patient's response to the physician's management of their case. This story should be legible and clear enough to allow another medical/healthcare provider to assume management of the case after an initial review of the chart notes. Full SOAP charting at each visit, while recommended, is not required, but components of the file should include:

A. Subjective complaints

The patient's complaints should be recorded at each visit (in the patient's own words when possible) indicating improvement, worsening or no change, or any significant event since the last visit with provider.

B. Objective findings

Changes in the objective signs of a condition should be noted at each visit in the doctor's own words.

C. Assessment or diagnosis

It is not necessary to update this category at each visit. However, periodic clinical re-evaluations should be performed and these results included in the daily entries with any amendments in the diagnosis.

D. Plan of management

A provisional plan of management should be recorded initially and further entries should be made as this plan is modified and/or as a patient's condition changes and treatment is altered accordingly. Changes in procedures should be noted.

E. Procedures

Daily recording of procedures performed should include descriptions of therapeutic procedures performed, soft tissue techniques, modalities used, exercises prescribed, nutritional supplementation, over the counter medications, or prescribed diet and activity instructions. Patient response to therapies, and who provided those therapies, should be noted.

III. Written Reports

- A. History
 - 1. Presenting complaints
 - 2. Past medical history
 - 3. Family health history
 - 4. Patient's personal, social, and socio-economic history
- B. Examination findings
- C. Assessment, diagnosis, or clinical impression
- D. Plan of management and/or response to treatment
- E. Prognosis and/or outcome expectations

IV. Ancillary Documentation

- A. Correspondence (sent and received)
- B. Specialty reports (diagnostic imaging, lab nerve conduction studies, etc.)
- C. Communications (telephone log, dialogue with specialists and/or providers co-managing case or concomitant conditions that may have effect on presenting complaint, and family or friends of the patient, etc.)

CHAPTER IV

CHIROPRACTIC MANAGEMENT ALGORITHM (Rev. 01/2018)

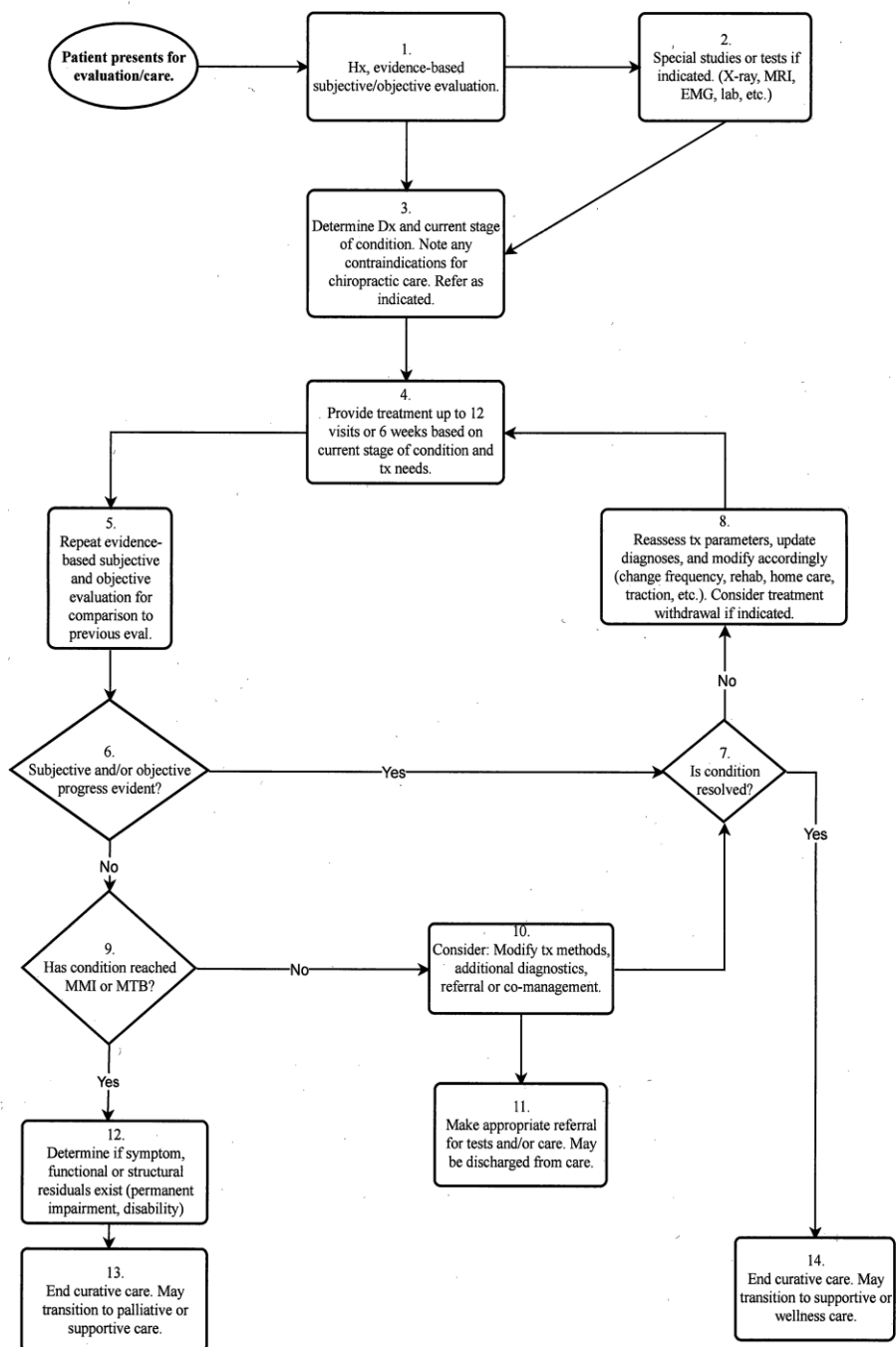
The following curative care algorithm, developed and accepted by a subcommittee of the OBCE (2014-2016), presents a clinical management path for the chiropractic physician to facilitate efficient patient recovery. The emphasis is on management of the patient, not on a specific pathophysiology.

Rehabilitation

Rehabilitation is treatment designed to facilitate the process of recovery from injury, illness, or disease. The goal of rehabilitation is to promote recovery, improve function, and to help the patient become self-reliant in management of their health. This generally involves transitioning the patient from passive to active care so as to achieve efficient patient recovery.

Pediatric patients

Pediatric evaluations require age appropriate inquiry and examination to determine treatment plans; this management may need to be modified.



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The following recommendations correlate and refer to the steps in the algorithm:

<u>Box 1:</u> <u>History,</u> <u>Subjective/Objective</u> <u>Evaluation</u>	<p><u>Chiropractors should conduct a medical history of the presenting condition and a past medical history including illnesses, hospitalizations, surgeries, and prior musculoskeletal conditions. The history should consider red flags and psychosocial risk factors. Subjective-based outcome assessment tools (OATS) of good reliability and validity should be used at this time to establish a baseline for pain, function, and/or disability.</u></p> <p><u>Chiropractors should perform a physical examination appropriate to the presenting complaint(s). Procedures should be chosen according to specificity and sensitivity, and have a relatively high likelihood for ruling in or out a specific condition. A physical examination should be neither more nor less than the presenting condition(s) require(s).</u></p>
<u>Box 2:</u> <u>Imaging and</u> <u>Special Studies</u>	<p><u>Chiropractors should determine the clinical necessity of additional testing that would improve their ability to accurately diagnose and/or provide treatment for the presenting condition(s). This testing can include, but is not limited to: diagnostic imaging, radiographs, laboratory, EMG, functional capacity, etc.</u></p> <p><u>Clinical necessity should be reflected in the records including the concerns warranting the study and how the results will influence management.</u></p>
<u>Box 3:</u> <u>Determine</u> <u>Diagnosis, Stage of</u> <u>Condition, and any</u> <u>contraindications to</u> <u>care</u>	<p><u>Based on history and examination, chiropractors should determine and document a diagnostic impression expressed in generally accepted terminology. The diagnostic impression clarifies the details of the diagnosis, including stage of condition (acute, sub-acute, repair, remodeling, chronic), and contributing and complicating factors.</u></p> <p><u>If any of the patient's conditions are outside the scope of practice or clinical capacity of the specific chiropractor, or if treatment is contraindicated, then a referral to a different provider should be made and documented.</u></p>
<u>Box 4:</u> <u>Treatment Plan</u>	<p><u>Chiropractors should formulate a treatment plan appropriate to the diagnostic impression and the patient's presentation. This should include the frequency and duration of treatment, specific therapies, and goals for each. The treatment plan should not exceed 12 visits or 6 weeks before an updated evaluation for curative care (example: 3x/week for 4 weeks acute, or 2x/week for 6 weeks subacute).</u></p> <p><u>Proposed treatment plan(s) and prognosis should be discussed in the context of the report of findings and PARQ conference. Informed consent shall be documented.</u></p>
<u>Box 5:</u> <u>Re-Evaluation</u>	<p><u>An updated evaluation of the subjective OATS and objective/functional examination should be performed at regular intervals, or whenever clinically relevant, to determine patient progress, efficacy of care, and necessity of additional treatment. Intervals between re-evaluations</u></p>

Chapters 1-3 are final and Ch. 4-6 are still under review.

	<p><u>should not exceed 12 visits or 6 weeks, depending on the patient's current condition and treatment goals. See above examples.</u></p>
<p><u>Box 6:</u> <u>Determine if</u> <u>progress is shown</u></p>	<p><u>A comparison of the new evaluation findings (from Box 7) to the previous evaluation findings should be performed to determine progress (OATS, functional, etc.). Patient progress should be determined by comparing previous to current findings and assessed by the physician for clinically meaningful change. (OATS specific, ICA guidelines, etc.)</u></p> <p><u>If progress is shown, go to box #7. If no improvement, go to box #9.</u></p>
<p><u>Box 7:</u> <u>Is Condition</u> <u>Resolved?</u></p>	<p><u>The chiropractor should determine if the condition has resolved (subjectively, functionally, structurally, etc.). This should be goal-specific. Possible endpoints of care should be when patient is at pre-injury status or maximum medical improvement.</u></p> <p><u>If resolved, go to box #14. If not resolved, go to box #8.</u></p>
<p><u>Box 8:</u> <u>Modify Treatment if</u> <u>indicated</u></p>	<p><u>As treatment continues, the diagnoses should be amended based on the patient's clinical presentation. If indicated, the chiropractor should modify treatment, including but not limited to: changing the frequency of visits, modifying modalities, updating home care instruction, etc. If appropriate, treatment frequency may be proportionately decreased in order to determine the patient response to daily living without care prior to the next evaluation.</u></p>
<p><u>Box 9:</u> <u>Has condition</u> <u>reached Maximum</u> <u>Medical</u> <u>Improvement or</u> <u>Therapeutic Benefit?</u></p>	<p><u>If the patient is not showing progress with care, then the chiropractor should determine whether the patient has reached maximum medical improvement (MMI) or maximum therapeutic benefit (MTB). MMI refers to a date from which further recovery or deterioration is not anticipated. MTB refers to when provided care no longer provides benefit, but other options may still exist for improvements.</u></p> <p><u>If MMI/MTB, then go to box #12. If not, go to box #10.</u></p>
<p><u>Box 10:</u> <u>Modify Case</u> <u>Management</u></p>	<p><u>If the patient is not progressing and is not considered MMI or MTB, the chiropractor should consider psychosocial factors and other treatment options. Examples of other or additional treatment options include, but are not limited to: referral to another provider, referral for additional testing, adding or removing therapeutic modalities from the treatment plan, etc.</u></p> <p><u>If referral is indicated, go to box #11. To continue care, go to box #7 (May do both)</u></p>
<p><u>Box 11:</u> <u>Referral and/or</u> <u>Discharge</u></p>	<p><u>See box #2 and #3 to determine appropriate referral needs. It is possible that chiropractic care is terminated at this time, even if the patient's condition can benefit from a different care provider. Any referrals should be documented in the patient records.</u></p>
<p><u>Box 12:</u> <u>Residual Findings/</u> <u>Permanent</u> <u>Impairment</u></p>	<p><u>When a patient's condition has reached MMI or MTB, if any residuals are still evident (subjective, functional, objective, structural, etc.), the chiropractor should determine if a permanent impairment evaluation and/or disability rating is indicated. All residuals should be documented and discussed with the patient. MTB patients may be referred out.</u></p>

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<u>Box 13:</u> <u>End curative care</u> <u>with residuals.</u>	<u>Curative care should be ended after MMI or MTB has been determined</u> <u>and residuals (if any) should be documented. The patient may be</u> <u>transitioned into supportive care or palliative care if indicated.</u>
<u>Box 14:</u> <u>End curative care.</u>	<u>When ending curative care, the patient may be transitioned to</u> <u>supportive or wellness care, if indicated.</u>

Maintenance Care:

The term “maintenance care” is not well-defined at this time in scientific literature and is inherently vague. For purposes of this document, the OBCE will forego its use.

Supportive Care:

Supportive care is ongoing treatment/care for patients who have reached MTB but who may fail to sustain these benefits and may progressively deteriorate without treatment. In addition, it is intended to minimize exacerbations and degenerative sequelae. Supportive care sometimes includes the return to curative care for the waxing and waning of chronic conditions. It follows appropriate application of active and passive treatments including rehabilitation and/or lifestyle modifications. It is appropriate when alternative care options, including home-based self-care or referral have been considered and/or attempted. Supportive care may be inappropriate when it interferes with other therapeutic protocols.

Wellness Care:

The purpose of chiropractic wellness care is to enhance and optimize a patient’s physical well-being and potentially prevent the future onset of symptoms. It is not limited to spinal manipulation but could include any element of the chiropractor’s scope of practice.

Nothing in the existing laws or rules of the Board announce a separate standard of care for “wellness care,” “maintenance care,” “curative,” or “palliative” care. All require that the patient is entitled to an appropriate physical examination, a report of findings following the examination, including a clinical impression, and recommendations for care, followed by a PARQ, in order to obtain informed consent from the patient prior to rendering therapeutics.

Palliative Care:

Palliative care is treatment to temporarily improve a patient’s quality of life without anticipation of overall improvement.

CHIROPRACTIC MANAGEMENT ALGORITHM

This algorithm develops a clinical management path for the chiropractic patient; to facilitate their recovery in the shortest time and the most cost effective manner possible. The algorithm is presented primarily to organize the chiropractic physician's application of diagnostic and therapeutic interventions. The emphasis is on management of the patient and not on management of a particular pathophysiology. This is because any one patient may present with multiple pathophysiologies or their clinical course may progress through multiple pathophysiological states requiring management modification.

An algorithm provides a visual tool for communication of expected diagnostic and therapeutic applications from the Oregon Board of Chiropractic Examiners to practicing chiropractors, from the individual D.C. to his patient and from the D.C. to third parties involved with any particular patient. Key points are defined for the referral to another physician and/or health care provider and for the reporting of information to patients and to involved third party payors. Concurrent allopathic and/or psychological management is incorporated into this scheme and the algorithm identifies the usual protocol for chiropractic management alternatives of a patient at maximum clinical improvement.

The algorithm is organized into three basic sections: diagnostics, therapeutics and maximum clinical improvement. The diagnostics section includes history, examination, data collection, special studies or examinations ordered by the D.C., allopathic procedures ordered by the D.C. and allopathic procedures ordered by any consulting discipline; including but not limited to, allopathic, osteopathic, psychiatric or psychological. The therapeutic section defines three feedback loops originating with the clinical reevaluation of patients who are showing poor progress, multiple exacerbations or no response to the provisional management plan. The maximum clinical improvement section defines four categories of patients and describes appropriate management alternatives at that juncture.

The sequence of this algorithm begins with consultation, history of present illness, physical examination and collection of data to confirm and analyze the medical history. Based on this information a clinical impression is rendered. This initial impression may be modified by any special studies or examinations ordered as they may identify complicating conditions which will naturally modify the resulting treatment plan or prognosis.

At this point, prior to treatment, the D.C. may desire a medical or surgical consultation. The consultation may result in a referral for medical management or feedback into chiropractic management with concurrent medial treatment. Based on these clinical impressions, a provisional treatment plan is formulated with a time line and goals for expected subjective and objective response. After reporting this to the patient, treatment is initiated.

Treatment response is monitored and documented objectively and subjectively in the patient's records. Appropriate progress to treatment usually confirms the initial clinical impressions and a more accurate prognosis can be formulated and reported to the patient, third party payors and

employers, if indicated. Assuming continued improvement with treatment, the management may be modified based on the patient's stage of recovery until maximum clinical improvement is reached.

For patients making poor progress, patients with multiple exacerbations or patients showing no response to treatment, clinical re-evaluation is indicated. At this point, the D.C. may elect four courses of action: first, to redefine the prognosis, goals and time line and continue with treatment; second, to modify the patient's management with his consent; third, to refer the patient to another physician and/or health care provider; fourth, to perform other special studies or examinations as indicated by the re-evaluation. This final option loops into the diagnostic section of the algorithm allowing the clinical impressions to be altered or modified. This resulting modified impression and treatment plan may include additional chiropractic or conservative therapies, concurrent allopathic or psychological treatment or referral to other disciplines. After the patient's consent is obtained, modified treatment is continued.

Usually four groups of patients exist at maximum clinical improvement. Those who are asymptomatic and without objective findings are discharged. Those who are asymptomatic with objective findings may be clinically re-evaluated and their management modified or given an

Chapters 1-3 are final and Ch. 4-6 are still under review.

~~appropriate referral. Patients who are still symptomatic and retain objective findings may be referred for impairment rating, work capacity evaluation and/or vocational rehabilitation if it is appropriate. These patients should be instructed in or referred to self help and pain management programs and often require some supportive or maintenance treatment. Patients who are symptomatic but without objective findings may be instructed in or referred to self help or pain management programs, other appropriate health care providers or discharged.~~

~~This algorithm was developed utilizing the combined experience of chiropractic physicians and the academic departments at Western States Chiropractic College and is not considered the only approach to chiropractic patient management in the State of Oregon. Further refinement and validation of this scheme is expected. We are not implying that this algorithm actually improves the clinical outcome of any particular patient group progressing through a course of chiropractic treatment. However, it does represent a tool for clinical decision making and stresses three chronological phases in patient management: diagnostics, therapeutics and maximum clinical improvement. It also allows for feedback loops returning to the diagnostic section based on information obtained in the therapeutics section of this model.~~

~~ALGORITHM~~

~~(insert manually)~~

CHAPTER V

TREATMENT PARAMETERS FOR COMMON NMS CONDITIONS

The following treatment parameters are to be used only as guidelines. These are estimates of treatment and/or healing time for commonly encountered categories of neuromusculoskeletal conditions. Disorders outside the NMS system are not addressed by this document. As stated in the preamble, this is an ongoing and dynamic process. These parameters will be amended or modified as new research and expert clinical judgments fill in the inevitable gaps in this process.

The suggested parameters do not reflect the protracted healing time and disability that may result from individual conditions complicated by such factors as previous injuries, congenital or developmental defects, systemic diseases, degenerative disorders, obesity, smoking, psychosocial compromise and others. In such conditions, or if the natural history of an injury is interrupted by aggravations, exacerbations, or flare-ups; applicable treatment guidelines could be modified or extended. However, benefit of care should be supported by subjective and objective documentation.

CATEGORY I

0 - 6 WEEKS TREATMENT

1. ~~Mild-moderate strain~~ 1st degree/Grade I strains
2. ~~Mild sprain~~ 1st & 2nd degree/Grade I & Grade II sprains
3. ~~Mechanical/joint dysfunction (uncomplicated)~~ Subluxation/mechanical joint dysfunction
4. ~~Subluxation (uncomplicated)~~
- 5.4. ~~Acute~~ & chronic facet syndrome
- 6.5. ~~Contusion~~
- 7.6. ~~Mild-moderate tendinitis, capsulitis, bursitis, synovitis~~
- 8.7. ~~Mild sacroiliac syndrome~~
- 9.8. ~~Acute-M~~ myofascial pain syndrome
- 10.9. ~~Mild symptomatic degenerative joint disease~~ Included in mechanical joint dysfunction
- 11.10. Headaches: vertebrogenic, muscle contraction, migraine, ~~vascular~~ acute & chronic or episodic
- 12.11. Torticollis (~~acquired~~) non-congenital)

CATEGORY II

2 - 12 WEEKS TREATMENT

1. Moderate-marked strain
2. ~~Moderate sprain~~ 3rd degree/Grade II sprains
3. ~~Post-traumatic mild-moderate myofibrosis~~
- 4.3. ~~Post-traumatic periarticular fibrosis and joint dysfunction with marked tendinitis, bursitis, capsulitis, synovitis~~
- 5.4. ~~Chronic tendinitis, bursitis, capsulitis, synovitis~~
6. ~~Chronic facet syndrome~~
7. ~~Moderate sacroiliac syndrome~~
- 8.6. ~~Chronic-S~~ sacroiliac syndrome with marked myofascial pain syndrome
- 9.7. ~~Chronic-M~~ myofascial pain syndrome recurrent
10. ~~Mechanical/joint dysfunction (complicated)~~
11. ~~Subluxation (complicated)~~
8. ~~Subluxation/mechanical joint dysfunction with instability~~
12. ~~Moderate symptomatic degenerative joint disease~~
- 13.9. ~~Mild inter-vertebral disc syndrome w/o myelopathy~~ Disc tear/protrusion without myelopathy

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- ~~14. Chronic headaches: vertebrogenic, muscle contraction, migraine, vascular~~
- ~~15.10. Mild temporomandibular joint dysfunction~~
- ~~16.11. Symptomatic spondylolisthesis (must list grade & with or without pars defect)~~
- ~~17. Mild clinical joint instability~~

CATEGORY III

1 - 6 MONTHS TREATMENT

- 1. ~~Chronic~~ Facet syndrome associated with clinical vertebral instability - measurable instability 3mm or more
- 2. Marked strain associated with post traumatic myofibrosis ~~and/or with~~ joint dysfunction
- ~~3. Marked sprain with associated instability/dysfunction~~
- ~~4.3. Thoracic outlet syndromes~~
- ~~5.4. Moderate inter-vertebral disc syndrome w/o myelopathy~~ Inter-vertebral disc protrusion with migration but without myelopathy
- ~~6.5. Peripheral neurovascular entrapment syndromes (identify what?)~~
- ~~7.6. Moderate to marked temporomandibular joint dysfunction~~
- ~~8.7. Adhesive capsulitis (frozen joint)~~ Manipulation & rehabilitation of adhesive capsulitis (frozen joint)
- ~~9.8. Partial or complete dislocation – identify what structures – not all require follow up~~

CATEGORY IV

2 - 12 MONTHS TREATMENT

- 1. Intervertebral disc protrusion without cord compression, with or without radiculopathic symptoms
- ~~1.2. Marked inter-vertebral disc syndrome w/o myelopathy, with or without radiculopathy~~
- ~~2.3. Lateral recess syndrome – needs clarification~~
- ~~3.4. Intermittent neurogenic claudication – needs more precise definition~~
- ~~4.5. Acceleration/deceleration injuries of the spine with myofascial complications (whiplash) with measurable instability~~
- ~~5.6. Cervicobrachial sympathetic syndromes/brachial plexus syndromes~~
- ~~6.7. Sympathetic dystrophies~~ Complex regional pain syndrome
- ~~7.8. Severe strain/sprain of cervical spine with myoligamentous complications~~ Grade III sprains & strains

RE-ASSESSMENT

The following circumstances are offered as an indication for reassessment by the treating physician. Clinical evidence or special circumstances may support continued treatment and/or work loss beyond these guidelines.

However, lack of justification for such management would indicate the need for consultation/second opinion and/or special examination.

- 1. Daily treatment exceeding two consecutive weeks
- 2. Treatment 3x/week exceeding six consecutive weeks
- 3. Authorized full time work loss for longer than four consecutive weeks
- 4. No objective or subjective improvement noted within the guideline parameters as outlined in this chapter.

CHIROPRACTIC CARE

The previous categories of care pertain to acute care or initial primary therapy. Because chiropractic education and training also includes the application of rehabilitative care and maintenance care, the following provides an appropriate explanation for the administration of these forms of treatment.

REHABILITATIVE CARE: The rehabilitation protocol of Chiropractic Rehabilitation Association are the accepted clinical chiropractic standards for rehabilitative care. These are updated annually and are available in the administrative office of the Oregon Board of Chiropractic Examiners.

MAINTENANCE CARE includes both preventive and supportive care.

Preventive care involves the reduction of the incidence and/or prevalence of illness, impairments, and risk factors, and the maintenance of optimal functions.

Supportive care sustains previous therapeutic gains that might otherwise progressively deteriorate. Supportive care follows appropriate application of acute care and rehabilitation and includes concurrent life style modification efforts. In addition, it is intended to minimize complications and degenerative sequelae.

Appropriateness of Maintenance Care

Preventive care is considered to be appropriate in an outwardly healthy individual who may have no symptoms and in whom signs of illness or impairment may be absent, minimal or subclinical. Preventive care may be inappropriate when it interferes with other appropriate primary care or when the risk of preventive care outweighs the benefits.

Supportive care is appropriate for a patient who has reached maximum therapeutic benefit (maximum medical improvement), and in whom periodic trial of therapeutic withdrawal fail. It is appropriate when rehabilitative and/or functional restorative and alternative care options, including home-based self-care and life style modification, have been considered and attempted. Supportive care is appropriate in patients who display persistent and/or recurrent signs of illness or impairments.

Supportive care may be inappropriate when it interferes with other appropriate primary care or when the risk of supportive care outweighs the benefits, e.g. physician dependence, somatization illness behavior, or secondary gain.

Guidelines for determining frequency and duration of maintenance care should be based upon the definitions provided above, with the understanding that clinical circumstances and other considerations, such as age, occupation, etc., as determined by the attending chiropractic physician, will alter duration and frequency needs and that application of care will result in reasonable differences in patient status. The determination of frequency and duration is subject to clinical judgment and at times may require peer review and further consultation.

Chiropractic doctors commonly recommend monthly visits for the purpose of supportive care. More frequent visits may be clinically justified.

Preventive care is usually applied less frequently, but would rarely be less than once per year.

Commented [CMS1]: How does this section align with the information around the algorithm?

CHAPTER VI

CHIROPRACTIC GLOSSARY OF COMMONLY USED TERMS

Acute - ~~common usage~~: of recent onset (hours or days); sharp; poignant; having a short and relatively severe course. (4)

Adhesion - a fibrous band or structure by which parts adhere abnormally. (4)

Adjustment - a chiropractic word of art; as defined by Janse, it is a specific form of direct articular manipulation utilizing either long or short leverage techniques with specific contacts and is characterized by a dynamic thrust of controlled velocity, amplitude and direction. (3)

Algorithm - a mechanical procedure for solving a certain kind of mathematical problem; a step-by-step method of solving a problem, as in making a diagnosis. (4)

Alignment - the act of aligning; the adjusting of a line. (2)

Analysis - separation into component parts; the act of determining the component parts of a substance. (4)

Anomaly - marked deviation from the normal standard, especially as a result of congenital defects. (4)

Arthritis - inflammation of a joint. (4)

Arthrosis — 1. Articulation or line of juncture between two bones; 2. degenerative joint disease of the truly movable joints of the spine or extremities. (10)

Asymmetry - lack or absence of symmetry of position or motion. Dissimilarity in corresponding parts or organs of opposite sides of the body which are normally alike. (4)

Barrier - a boundary of any kind. (2)

Anatomic barrier - the limit of anatomical integrity; the limit of motion imposed by an anatomic structure. Forcing the movement beyond this barrier would produce tissue damage. (7)

Elastic barrier (physiologic) - the elastic resistance that is felt at the end of passive range of movement; further motion toward the anatomic barrier may be induced passively. (7)

Chiropractic — is defined in Oregon pursuant to ORS 684.010.

Chiropractic practice — chiropractic is a discipline of the scientific healing arts concerned with the pathogenesis, diagnostics, therapeutics and prophylaxis of functional disturbances, pathomechanical states, pain syndromes and neurophysiological effects related to the static and dynamics of the locomotor system, especially of the spine and pelvis. (13)

Chiropractic science — chiropractic science is concerned with the investigation of the relationship between structure (primarily the spine) and function (primarily the nervous system) of the human body that leads to the restoration and preservation of health. (12)

Commented [CMS2]: This change was made by the board in March, 2018.

Chapters 1-3 are final and Ch. 4-6 are still under review.

Chronic - long standing (≥ 6 weeks, ~~months or years~~). Symptoms may range from mild to severe. (+)

Compensation - the counterbalancing of any defect of structure or function. (+) - Changes in structural relationships to accommodate for foundation disturbances and maintain balance. (S)

Contraction - a shortening or reduction in size; in connection with muscles, contraction implies shortening and/or development of tension. (+)

Contracture - a condition of fixed high resistance to passive stretch of a muscle resulting from fibrosis of the tissues supporting the muscle or joint. (+)

Diagnosis - the art of distinguishing one disease from another. (+)

Clinical diagnosis - diagnosis based on signs, symptoms and laboratory findings during life. (+)

Physical diagnosis - determination of disease by inspection, palpation, percussion and auscultation. (+)

Discogenic - ~~common usage~~; caused by derangement of an inter-vertebral disc. (+)

Discopathy - any pathological changes in a disc. (3)

Displacement - removal from the normal position or place; ~~(1)~~; as pertaining to vertebral displacement, it refers to a disrelationship of the vertebra to its relative structure. (S)

Facet Syndrome - common usage: back pain and dysfunction caused by a lesion of a posterior facet joint. This may be accompanied by referred pain in the lower extremity.

Fibrosis - the formation of fibrous tissue. (+)

Fibrositis - inflammatory hyperplasia of the white fibrous tissue of the body, especially of the muscle sheaths and fascial layers of the locomotor system. (+)

Fixation - (dynamic fault) - the state whereby articulation has become temporarily immobilized in a position which it may normally occupy during any phase of physiologic movement. The immobilization of an articulation in a position of movement when the joint is at rest, or in a position of rest when the joint is in movement. (8)

Functional - affecting the function but not the structure; said of disturbances with no detectable organic cause; idiopathic. (+)

Health - a state of optimal physical, mental, and social well-being and not merely the absence of disease and infirmity. (+)

Hyper - ~~beyond over or~~ excessive. (+)

Hypo - under or deficient. ~~(+)~~

Instability - quality or condition of being unstable; not firm, fixed or constant. (+5)

Ischemic compression - application of progressively stronger ~~painful~~ pressure on a trigger point for the purpose of eliminating the point's tenderness. (4)

Joint dysfunction - joint mechanics showing area disturbances of function without structural change - subtle joint dysfunctions affecting quality and range of joint motion. They are diagnosed with the aid of motion palpation, and stress and motion radiography investigation. (+4)

Chapters 1-3 are final and Ch. 4-6 are still under review.

Joint play - discrete, short range movements of a joint independent of the action of voluntary muscles, determined by springing each vertebrae in the neutral position. (5)

Manual Therapy - ~~common usage~~: therapeutic application of manual force. Includes such procedures as massage, active relaxation, passive stretch, exercises, joint mobilization, thrust manipulation, immobilization and stabilization. (18)

Manipulation - passive maneuver in which specifically directed manual forces are applied to ~~vertebral~~ spinal and ~~extravertebral~~ extra-spinal articulations of the body, with the object of restoring mobility to restricted areas. (17)

Massage - the systematic therapeutical friction, stroking and kneading of the body. (1)

Mobilization - the process of making a fixed part movable. (1) A form of manual therapy applied within the physiological passive range of joint motion and is characterized by non-thrust passive joint manipulation. (17)

Myofascial pain syndrome - pain and/or autonomic phenomena referred from active myofascial trigger points with associated dysfunction. ~~The specific muscle or muscle group that causes the symptoms should be identified.~~ (4)

Myofascial trigger point - a hyper-irritable spot, usually within a taut band of skeletal muscle or in the muscle's fascia, that is painful on compression and that can give rise to characteristic referred pain, tenderness, and autonomic phenomena. A myofascial trigger point is to be distinguished from cutaneous, ligamentous, periosteal and non-muscular fascial trigger points. Types include active, latent, primary, associated, satellite and secondary. (4)

Myofascitis - a) Inflammation of a muscle and its fascia, particularly at the fascial insertion of muscle to bone;
b) Pain, tenderness, other referred phenomena, and the dysfunction attributed to myofascial trigger points. (4)

Myofibrosis - replacement of muscle tissue by fibrous tissue. (1)

Nerve interference - a chiropractic term used to refer to the interruption of normal nerve transmission (nerve energy). (5)

Neurogenic - ~~this word is often used to mean~~ originating in nerve tissue; example: "the cause of the disorder is neurogenic." (11)

Neuropathy - a general term denoting functional disturbances and/or pathological changes in the peripheral nervous system. (1)

Neurophysiologic effects - a general term denoting functional or aberrant disturbances of the peripheral or autonomic nervous systems. The term is used to designate nonspecific effects related to: a) motor and sensory functions of the peripheral nervous system; b) vasomotor activity, secretomotor activity and motor activity of smooth muscle from the autonomic nervous system, e.g., neck, shoulder, arm syndrome (the extremity becomes cool with increased sweating); c) trophic activity of both the peripheral and autonomic nervous system, e.g., muscle atrophy in neck, shoulder, arm syndrome. (15)

Objective - pertaining to those relations and conditions of the body perceived by another, as objective signs of disease. (1)

Osteophyte - a degenerative exostosis secondary to musculotendinous stress. (10)

Chapters 1-3 are final and Ch. 4-6 are still under review.

Palpation - a) The act of feeling with the hand. (+)

Motion palpation - palpatory diagnosis of passive and active segmental joint range of motion. (+)

Static palpation - palpatory diagnosis of somatic structures in a neutral static position. (+)

Prognosis - a forecast as to the probable outcome of an attack of disease; the prospect as to recovery from a disease as indicated by the nature and symptoms of the case. (+)

Referred pain - pain felt in a part other than that in which the cause that produced it is situated. (+)

Restriction - limitation to movement. Describes the direction —of limited movement in subluxated and/or dysfunctional joints. (+)

Sacroiliac Syndrome - pain over one sacroiliac joint in the region of the posterior superior iliac spine. This may be accompanied by referred pain in the leg. (+)

Scoliosis - an appreciable ~~lateral~~ deviation in the normally straight vertical line of the spine. (+)

Functional scoliosis - ~~lateral~~ deviation of the spine resulting from poor posture, foundation anomalies, occupational strains, etc., that are still not permanently established. (+)

Structural scoliosis - permanent ~~lateral~~ deviation of the spine; such that the spine cannot return to neutral position. (+)

Short leg - an anatomical, pathological or functional leg deficiency leading to dysfunction. (+)

Sign - an indication of the existence of something; and objective evidence of a disease, i.e. such evidence as is perceptible to the examining physician, as opposed to the subjective ~~sensations~~ (symptoms) of the patient. (+)

Spondylitis - inflammation of the vertebrae. (+)

Spondyloarthrosis - arthrosis of the synovial joints of the spine. (+)

Spondylolisthesis - anterior or posterior slippage of a vertebral body on its caudal fellow. (+)

Spondylolysis - is defined as an interruption in the pars interarticularis which may be unilateral or bilateral. (+)

Spondylophytes - degenerative spur formation arising from the vertebral end plates and usually projecting somewhat horizontally. (+)

Spondylosis - degenerative joint disease as it effects the vertebral body end plates. (+)

Spondylotherapy - the therapeutic application of percussion or concussion over the vertebrae to elicit reflex responses at the levels of neuromeric innervation to the organ being influenced. (+)

Sprain - joint injury in which some of the fibers of a supporting ligament are ruptured but the continuity of the ligament remains intact. (+)

Spur - a projecting body as from a bone. (+)

Strain - an overstretching and tearing of musculotendinous tissue.

Chapters 1-3 are final and Ch. 4-6 are still under review.

Stress - the sum of the biological reaction to any adverse stimulus, physical, mental or emotional, internal or external that tends to disturb the organism's homeostasis; should these compensating reactions be inadequate or inappropriate, they may lead to disorders. The term is also used to refer to the stimuli that elicit the reactions. (4)

Subacute - less than acute, between acute and chronic. (4)

Subjective - pertaining to or perceived only by the affected individual; may or may not be perceptible to the senses of another person.

Subluxation/Vertebral - vertebral subluxation is an aberrant relationship between two adjacent articular structures that alteration in the biomechanical and/or neurophysiological reflections of these articular structures, their proximal structures, and /or body systems ~~that~~ may be directly or indirectly affected by them. (46)

Symptom - ~~any subjective evidence of a patient's condition, i.e., such evidence as perceived by the patient. (1)~~ a physical or mental feature which is regarded as indicating a condition of disease, particularly such a feature that is apparent to the patient.

Syndesmophyte - inflammatory ossification of a ligament. (49)

Technique - any of a number of physical or mechanical ~~chiropractic~~ procedures used in the treatment of patients. (5)

Trigger point - see myofascial trigger point. (4)

CHAPTER VII

REFERENCES

Saunders, W.B. Dorland's Illustrated Medical Dictionary, 27th edition

Thatcher, V.S. (Ed. by) The New Webster Encyclopedic Dictionary of the English Language, Avenel Books, New York 1984

Janse, J. History of the Development of Chiropractic Concepts; Chiropractic Terminology, NINCDS Monograph, No. 15

Travell and Simons, Myofascial Pain and Dysfunction, The Trigger Point Manual; Williams and Wilkins, 1983

Peterson, D. Western States Chiropractic College Glossary of Chiropractic Terminology, 1984

Canadian Memorial Chiropractic College, Glossary of Chiropractic Terminology

Sandoz, R. Swiss Annals, Volume VI, 1976, "Some Physical Mechanisms and Effects of Spinal Adjustments"

Sandoz, R. Swiss Annals, Volume VI, 1976, "Classifications of Luxations, Subluxations and Fixations of the Cervical Spine"

Chapters 1-3 are final and Ch. 4-6 are still under review.

~~Kirkaldy-Willis, Managing Low Back Pain; Churchill Livingstone, 1983~~

~~Yochum, T. Two in One, A Radiologic Symposium, 1984~~

~~Houle, Edgar 1972~~

~~Griffin, L.K. 1973~~

~~European Chiropractic Union, 1973~~

~~Drum, D. The Vertebral Motor Unit and Intervertebral Foramen, in Goldstein, M. The Research Status of Spinal Manipulative Therapy Government Printing Office, Washington DC, 1975~~

~~Vear, H.J. 1973~~

~~Indexed Synopsis of ACA Policies on Public Health and Related Matters, 1987 edition, p. 18 (Approved by the House of Delegates, July 1987)~~

~~Gatterman, M.I. Complications of and Contraindications to Spinal Manipulative Therapy, J. Chiro 1982; 16(10):51+~~

~~Kaltenborn, F.M. Mobilization of the Extremity Joints, Third Edition, Olaf Norlis Bokhandel, Oslo; 1985~~

~~Yochum, T.R.; Rowe, LI Essentials of Skeletal Radiology, Williams & Williams, 1987~~

Educational Manual
for
Evidence-Based
Chiropractic



FORWARD

Objective

The primary objective of this patient-centered, evidence-based document is to provide an educational tool to assist chiropractic physicians and their patients in making decisions about appropriate chiropractic health care for better patient outcomes. The strength of this document is that it is patient-centered, supported by the best available evidence and not solely condition based.

Further this document is profession-initiated with broad representation by Oregon licentiates in the development process. Extensive grassroots support facilitates the educational process and promotes implementation. Patient-centered, evidence-based objectives put the interest of the patient first, based on the best available evidence. Individual differences mandate that what may be good for a typical patient may not be good for the individual patient requiring flexibility in interpretation. Consensus based standards of quality derived from high level evidence, provides a basis for peer review criteria, to assist the profession in decision making based on predetermined elements of care against which aspects of individual chiropractic care can be compared. Perfect decisions about optimum care are not possible since the process of analyzing evidence and opinion is imperfect. Nevertheless the potential benefits from patient-centered, evidence-based objectives are protection of patients, reduction in practice variation, quality assurance, and improved risk management.

The Status of Chiropractic Practice Guidelines in North America

Interest in chiropractic practice and utilization guidelines gained momentum in the latter part of the 1980's. Prior to 1990 several states, including Ohio, Oregon and Washington, had begun guideline development. With the publication of Vear's book: *Chiropractic Standards of Practice and Quality of Care* in 1992¹, some issues surrounding guidelines for chiropractic practice became formalized as standards. Beginning with the Mercy Conference Guidelines, published in 1993² practice guidelines for the chiropractic profession came into the national arena. Following directly on this publication, the politically driven Wyndham guidelines³ were published by a group of straight chiropractors dissatisfied the Mercy proceedings. The process for both sets of guidelines that were based on consensus relied heavily on the use of authoritative theory and opinion, lacking a systematic evaluation of supporting evidence.

Procedure based guidelines significantly impacting the chiropractic profession have also been developed on a national level by the RAND Corporation⁴⁻⁵ and the Agency for Health Care Policy and Research⁶. Both groups evaluated supporting evidence for the use of manipulation in the treatment of acute low back pain, concluding that it is both safe and effective. These studies have been embraced enthusiastically by some chiropractors, which has gained more mainstream recognition for a limited role in which the chiropractor treats only back pain, and possibly neck pain and some forms of headache.

Such a limited role, however, is not consistent with the broad scope of practice in the State of Oregon.

Guidelines continue to be put forth both nationally by the International Chiropractic Association (ICA)⁷ and the Council on Chiropractic Practice (CCP)⁸ and at the state level⁹ (Florida). These documents are still largely based on consensus opinion, without the panel members reviewing the best available evidence, and far from meeting the Institute of Medicine¹⁰ criteria for guideline development. The ICA, CCP and Florida Guidelines have conflicts with the accepted practice of chiropractic in Oregon relative to diagnosis, assessment and informed consent. The CCP guidelines are designed specifically for vertebral subluxation practice, which is not inclusive or representative of the practice of chiropractic in the State of Oregon. In addition some contributors and panel members listed in these guidelines did not participate directly in the consensus process. Of serious concern is the significant number of misleading references. Although found to be more acceptable, the Mercy guidelines are based primarily on consensus and have not been updated, necessitating development of a current document to guide chiropractic practice in the State of Oregon.¹¹

Current Status of Practice and Utilization Guidelines in Oregon

The Oregon Chiropractic Practice and Utilization Guidelines were published in 1991¹² by the Oregon Board of Chiropractic Examiners (OBCE) in response to public demand for more accountability. Developed through consensus, these guidelines were recognized in the Northwest as one of the most advanced documents at the time. Given the more than ten years that have elapsed since these guidelines were initiated, serious questions regarding their adequacy have been raised. In response to these questions, the OBCE implementing the strategic planning process, appointed a steering committee comprised of doctors of chiropractic, representative of the various constituencies in the State of Oregon, including: Chairman Charles Simpson (OBCE representative), members John Cafferty (subluxation based chiropractor), Thomas Dobson (initiator of the current guideline process), Janet Steward, and Jack Pederson (broad scope practitioners) with Meridel Gatterman as process consultant. Dr. Gatterman has 11 years of guideline development experience including: the Oregon Practice and Utilization Guidelines,¹² the Mercy Guidelines² and the Canadian Guidelines¹³. Published works that employed a facilitated consensus process include development of chiropractic nomenclature¹⁴, and a patient centered paradigm for both chiropractic¹⁵, and complementary medicine.¹⁶

The steering committee utilized the following four approaches to assess the status of the Oregon Chiropractic Practice and Utilization Guidelines, Volume I:

- survey of stakeholders;
- focus groups and key person interviews;
- expert reviews;
- application of the Institute of Medicine (IOM) of the National Academy of Sciences “provisional assessment instrument”.¹⁰

The survey and focus groups responses, key person interviews, and expert reviews all identified deficiencies in the 1991 guidelines. The steering committee concluded that the

1991 guidelines (derived primarily through consensus of expert opinion with little documentation of evidence) are in need of revision. Inclusion of current scientific evidence coupled with broad professional consensus was designed to make the revision more accountable, credible, as well as patient centered and evidence-based.

Patient Centered, Evidence-based Care

Patient centered care puts the patient first, before cost cutting by managed care, doctor's egos, or financial gain. Patient centered practice evaluates the individual patient's clinical state, predicament, and preferences, and applies the most efficacious interventions to maximize the quality and quantity of life for that person¹⁷. Chiropractic practice has traditionally been patient centered with anthropological and sociological studies providing evidence and seed material for a patient centered paradigm¹⁸⁻²⁰. Following evaluation of these studies combined with the philosophical first principles of chiropractic, a patient centered paradigm emerged.¹⁵. Subsequent to identification using qualitative methodology, a nominal panel comprised of chiropractic educators, researchers and practitioners validated a patient centered paradigm through a nominal consensus process. Based on this model the following characteristics of a patient centered paradigm were refined and agreed upon by the nominal consensus panel charged to assist in the development of the Oregon Practice Guidelines:

1. Recognition and facilitation of the innate organization and adaptation of the person;
2. Recognition that care should ideally focus on the total person;
3. Acknowledgment and respect for the patient's values, beliefs, expectations and health care needs;
4. Promotion of the patient's health through a preference for drugless, minimally invasive, and conservative care;
5. A proactive approach that encourages patients to take responsibility for their health;
6. The patient and patient centered practitioner act as partners in decision making, emphasizing clinically effective and economically appropriate care, based on various levels of evidence.

Evidence-based Care

Evidence-based practice has been defined as:

“the conscientious explicit, and judicious use of the current best evidence in making decisions about the care of individual patient's”¹⁷

Evidence-based practice means:

“integrating individual clinical expertise with the best available external evidence from systematic research”¹⁷.

Sackett emphasizes that “Good doctors use both individual clinical expertise, and the best available external evidence, and neither alone is enough. He notes that without clinical expertise, practice risks becoming tyrannized by evidence, because even excellent external evidence may be inapplicable or inappropriate for an individual patient. Without

current best evidence, practice risks rapidly becoming out of date, also to the detriment of the patient. Evidence-based practice is not “cookbook practice.” It is also recognized that the best available evidence is not just limited to external evidence from randomized controlled trials but also involves the individual clinicians' expertise along with the consensus of leading chiropractic clinicians and researchers based on varying degrees of patient-centered clinical research. A thorough literature review is crucial to successful evidence based practice¹⁷.

The Epistemology of Scientific Knowledge

Consideration of how we know what we know is based on a hierarchy of ways of knowing. This hierarchy gives us the degree of certainty that can be attributed to evidence.

1. Laws or Principles of Science

Theories that have been scientifically demonstrated and are now accepted as scientific fact based on a sequence of events occurring with unvarying uniformity under the same conditions. Laws and principles explain natural actions.

2. Theories of Science

A set of related ideas that have the potential to explain or predict human experience in an orderly fashion and that are based on data. Theories follow a hypothesis that has been investigated and is now in an advanced data gathering mode. Although there are many questions that still need to be answered, this category of scientific knowledge is frequently used clinically as if it were a demonstrated fact.

3. Hypothesis

Hypotheses are testable statements referred to as the working tools of science. A question or conjecture is presented and tested through observation and data gathering and processing.

4. Conjecture

An opinion of an expert person in a given field of science based on slight evidence.

Guidelines for Grading Evidence

The strength of both scientific and legal evidence is graded according to three levels. Standards of practice require higher levels of supporting evidence on which to judge competency. Due to resource limitations, evidence ratings in this document are limited to Standards. References following statements clearly indicate what evidence supports this document.

Scientific Evidence

The convention for grading scientific evidence is based on a hierarchy of levels that provide degrees of predictability.

Type I

Evidence provided by one or more well designed* randomized controlled clinical trial(s) (RCT) for therapeutic interventions or by one or more well designed descriptive studies that address sensitivity, specificity, and predictive value (for diagnostic procedures/devices).

Type II

Evidence provided by one or more well designed observational studies, such as a case control or cohort study, or a well designed prospective case series, or clinically relevant basic science studies that address sensitivity, specificity, and predictive value.

Type III

Evidence provided by studies not meeting the criteria of Type I or II, that may include expert opinion, field practitioner consensus, or other sources, as judged by an Expert Panel.

* For the purpose of this document, “well designed” refers to a study that has, at a minimum, relatively high internal validity (low systematic error) and sufficient precision for statistical significance (adequate study numbers)

Legal Evidence

Legal evidence is also based on a hierarchy of supporting evidence ranging from statutes which are mandatory to legal opinion that is discretionary.

Legal Type I

This administrative aspect of practice is mandated by ORS or OAR, or is found to be essential and is necessary (A standard of practice).

Legal Type II

This administrative aspect of practice is supported by uncontrolled studies and/or published legal opinion and is recommended, and in some cases mandatory. (Official AG opinion vs., “legal opinion” written in a legal peer review journal vs. “case law” opinion)

Legal Type III

This administrative aspect of practice is supported by a consensus of practitioners as determined by the Expert Panel or by expert legal opinion and is discretionary.

A Three Tiered Evidence-based Consensus Process

The process used to develop the following chapters involves three levels of consensus. Each chapter is developed first through a seed statement from a seed panel composed of 5-7 panel members that review the best available evidence. Seed statements are then reviewed by a 9-15 member nominal panel that reviews all chapters for consistency, continuity and to minimize redundancy. The final review is by a 100-member Delphi panel that reviews one or all chapters and participates in the consensus process by mail.

Panel Selection

Selection of panel members is made by the Steering Committee based on the following criteria:

A. Geographical representation

- B. Philosophical representation
- C. Gender representation
- D. Practice experience representation

Where possible a balance of each population identified will be included. To facilitate frequent meetings balanced geographical representation is not always possible at the seed panel level.

Challenges to the Consensus Process

Challenges to the consensus process have included lack of differentiation between guidelines and standards, political opposition to guideline development, limited resources, and a scarcity of quality evidence.

Standards versus Guidelines

Despite peer reviewed publication of a paper by two steering committee members and one nominal panel member that differentiated between guidelines and standards²¹, there remains the perception by many that guidelines are synonymous with standards. This in part is due to the inappropriate use of guidelines as absolute standards by third party payers and attorneys. While this utilization of guidelines is not consistent with the defined use of these terms in the literature, the process has been hampered by the fear that development of guidelines will lead to misuse.

Guidelines are considered to be recommendations that allow for flexibility and individual patient differences. Standards are more binding and require a high level of supporting evidence. While guidelines serve as educational tools to improve the quality of practice, standards that outline minimum competency are used more as administrative tools on which to base policy. Confusion generated by poor differentiation of guidelines from standards therefore contributes to mistrust of the guideline process. Because of this challenge the updated Oregon Practice and Utilization Guidelines document is referred to as a Manual for Evidence Based Chiropractic Practice. Where applicable, standards are clearly stated.

Political Opposition

Opposition to updating the Oregon practice and utilization guidelines by representatives of one political organization is an ongoing challenge to the process. A concerted attempt by members of the steering committee, the OBCE and members of the profession to engage these individuals in continued participation in the process has been made, emphasizing that the way to ensure that the process is inclusive is to participate. Various claims regarding lack of inclusion of evidence or changes in seed statements as they proceeded through the process could have been easily addressed and resolved if these individuals would have communicated their concerns in a timely manner and continued their participation. At all times the process has worked to improve seed statements as they achieved consensus through the seed panel, nominal panel and Delphi process.

Resources

A challenge to the current process is the lack of adequate resources to fully support an ambitious effort. A grant application for outside funding was not successful and a request for additional funding from the OBCE was not approved by the 2001 Legislative Session. This prevented contracting with a project manager as planned, contributing to slower progress.

However, the process has proceeded with strong support from numerous Oregon chiropractors who have contributed their time and energy to review evidence, draft seed statements, and attend meetings or review drafts sent to them by mail. The OBCE has supported this effort by providing meeting space, mailings, and printing services within its current budget.

Lack and Quality of Evidence

The greatest challenge to evidence-based practice is the lack of evidence. This is true of all health care professions.²² This has been especially acute for the chiropractic profession that has long been denied external funding. It is only in the recent past that significant federal funding has been applied to the study of chiropractic. This has created a problem of legitimization in which the science of chiropractic has been evaluated through the lens of the medical paradigm.

Paradigm

A paradigm is a socially constructed disciplinary matrix, grounded on habits of mind and webs of belief.²³ It is characterized by symbolic generalizations, shared models and shared values. It includes concepts, perceptions, and techniques shared by a scientific community and used by that community to define legitimate problems and legitimate solutions.²³ A paradigm is useful as both a plan of action and a lens through which the chiropractor views the patient. The chiropractor is thus provided with a worldview through which the science of chiropractic can advance, in the patient's interest.¹⁵

The Chiropractic Paradigm

The Association of Chiropractic Colleges (ACC)²⁴ agreed to the following chiropractic paradigm that has subsequently been adopted by the World Federation of Chiropractic:

The purpose of chiropractic is to optimize the patient's health. This is based on the principle that the body's innate recuperative power is affected by and integrated through the nervous system. The practice of chiropractic within the chiropractic paradigm includes:

- establishing a diagnosis;
- facilitating the body's homeostasis through emphasis on neurological and biomechanical integrity, and
- promoting health.

The Chiropractic Foundation

The foundation of chiropractic includes philosophy, science, art, knowledge, and clinical experience. The chiropractic paradigm directly influences the following:

- patient health through quality care;
- education;
- research;
- health care policy and leadership;
- relationships with other health care providers;
- professional stature; public awareness and perceptions

The Subluxation

Chiropractic is concerned with the preservation and restoration of health, and focuses particular attention on subluxation. A subluxation is a complex of functional and/or structural and/or pathological articular changes that compromise neural integrity and may influence organ system function and general health. A subluxation is evaluated, diagnosed, and managed through the use of chiropractic procedures based on the best available rational and empirical evidence.

Chiropractic Scope of Practice

Members of the Association of Chiropractic Colleges educate students for the competent practice of chiropractic. These accredited academic institutions have defined the scope of chiropractic practice within the chiropractic paradigm.

Since human function is neurologically integrated Doctors of Chiropractic evaluate and facilitate biomechanical and neuro-biological functions and integrity through the use of appropriate conservative, and diagnostic and chiropractic care procedures. Therefore, direct access to chiropractic care is integral to everyone's health care regimen.

Chiropractic Practice

A. Diagnosis

Doctors of Chiropractic, as primary contact health care providers, employ the education, knowledge, diagnostic skill and clinical judgment necessary to determine appropriate chiropractic care and case management. Doctors of Chiropractic have access to diagnostic procedures and/or referral resources as required.

B. Case Management

Doctors of chiropractic establish a doctor/patient relationship and utilize adjustive and other clinical procedures unique to the chiropractic discipline. Doctors of Chiropractic may also use other conservative patient care procedures, and when appropriate, collaborate with and/ or refer to other health care providers.

C. Health Promotion

Doctors of Chiropractic advise and educate patients and communities in structural and spinal hygiene and healthful living practices²⁴.

Chiropractic Nomenclature Developed through Consensus

Chiropractic nomenclature has been developed through agreement obtained by a rigorous process using both nominal and Delphi consensus methods¹⁴. Moving through increasingly complex stages agreement was reached on the following ten terms used to discuss chiropractic science.:

Articular functional units.

- Motion segment-A functional unit made up of the two adjacent articulating surfaces and the connecting tissues binding them to each other.
- Spinal motion segment- Two adjacent vertebrae, and the connecting tissues binding them to each other.

The lesion treated by chiropractors.

- Subluxation-A motion segment, in which alignment, movement integrity and/or physiological function are altered although contact between joint surfaces remains intact.
- Manipulable (chiropractic) subluxation-A subluxation in which alignment, movement integrity and/or function can be improved by manual thrust procedures.
- Subluxation complex-A theoretical model of motion segment dysfunction (subluxation) which incorporates the complex interaction of pathological changes in nerve, muscle, ligamentous, vascular and connective tissues.
- Subluxation syndrome-An aggregate of signs and symptoms that relate to pathophysiology or dysfunction of motion segments.

Treatment procedures utilized by chiropractors.

- Adjustment-Any chiropractic therapeutic procedure that utilizes controlled force, leverage, direction, amplitude, and velocity which is directed at specific joints or anatomical regions. Chiropractors commonly use such procedures to influence joint and neurophysiological function.
- Manual therapy-Procedures by which the hands directly contact the body to treat the articulations and/or soft tissues.
- Manipulation-A manual procedure that involves a directed thrust to move a joint past the physiological range of motion, without exceeding the anatomical limit
- Mobilization-Movement applied singularly or repetitively within or at the physiological range of joint movement, without imparting a thrust or impulse, with the goal of restoring joint mobility.

Introduction to the Philosophy, Science and Art of Chiropractic

The Traditional Philosophy of Chiropractic

The traditional vitalistic philosophy of chiropractic is based on the scientific philosophy of biology that features the functional organization of living beings.²⁵ Living beings are capable of maintaining their overall organization in the face of extensive variations in their environment.²⁵ Similar organization does not occur in the non-living world²⁵.

According to D.D. Palmer, the founder of chiropractic, the vital functioning of each individual is directed by the body's innate intelligence, and expression of universal intelligence.²⁶ Universal intelligence accounts for the universal regularities and laws of nature that are the concern of physics and chemistry, and the particular regularities and laws of physiology²⁷.

That those processes of bodily functioning whereby the body is regulated through electrophysiological, biochemical, immunological, and other mechanisms, forms the basis of the science of physiology. Palmer's concept of "innate intelligence", the ability of the body to regulate and repair itself, is also referred to as homeostasis.²⁸ The philosophy of chiropractic is based on the belief that the true locus of health comes from within through modulation by the nervous system. Recognition of the role of the nervous system in health and disease has increased in the last decade. Recent evidence that supports Palmer's traditional concept is exemplified by the emerging focus on neuroimmunology which provides evidence in support of a strong relationship between nervous system and immunological function²⁹.

The philosophy of chiropractic is both vitalistic and holistic³⁰. Chiropractic holistic philosophy views the patient as an whole person, not as a disease bearing organism. The body is seen as an integral unit capable of maintaining health. The systems of the body are viewed as complex, interactive, and have a powerful ability to self-correct provided functional integrity is maintained. The holistic philosophy of chiropractic promotes health, prevents illness, and encourages healing through care that focuses on the total individual in the context of personal, familial, social, and environmental factors.

Holism with respect to humans recognizes that the whole has properties that its parts lack and the properties of the parts interact to form the whole²⁵. Perceiving the whole is more difficult than the parts. It often requires subdividing the whole looking for connections and the interaction of the parts in the context of the whole. In the historical perspective of chiropractic philosophy there is an important interrelationship between optimal nerve function, the integrity of the musculoskeletal system, and health.

The Science of Chiropractic

Traditionally, the science of chiropractic has focused on the modulating function of the nervous system in the self healing of the human organism, and the role that interference with the nervous system has on the loss of optimal health. While this is fundamental to chiropractic principles the most compelling scientific evidence to date supports chiropractic treatment of neuromusculoskeletal conditions.

In the more than one hundred years that chiropractic has been in existence, much of the significant and reproducible research has been compressed within the past two decades. The past five years has been particularly significant with the evidence supporting the primary chiropractic intervention (manipulation) as one of the first-line means of health care intervention in the treatment of acute low back pain in adults. The science of

chiropractic comes from basic science evidence, case studies, clinical trials, and other outcome studies.

In 1975 the NINCDS (National Institute of Neurological, Circulatory, Disorders and Stroke) conference ³¹ found that “specific conclusions cannot be derived from the scientific literature for or against either the efficacy of spinal manipulative therapy or the pathophysiological functions from which it is derived”. Given the impetus of this conference, considerable research has been conducted demonstrating the safety and efficacy of this procedure. In spite of the paucity of funds, (up to 1994 coming solely from the profession itself), chiropractic researchers have made steady gains. With external funding, future gains promise to add significant data to support the uniqueness of chiropractic theories and to sustain evidence-based practice.

Basic science studies have been primarily designed to test theories related to one piece of the core of chiropractic practice, the chiropractic spinal subluxation. Where the spinal subluxation seen by allopathic (medical) practitioners is viewed radiographically and frequently demonstrates hypermobility, the chiropractic subluxation typically exhibits restricted motion, along with misalignment and altered neurological function⁵.

Anatomical studies related to subluxation have primarily investigated the components of the spinal motion segments including the zygapophyseal joints³²⁻³³ structures surrounding the intervertebral foramen³⁴⁻³⁹, and the sacro-iliac joints⁴⁰. Basic scientific evidence for chiropractic subluxation has also been demonstrated in 16 studies of animal models⁴¹.

Studies in the field of neuroscience have included investigation of the innervation of components of the spinal motion segment^{42,43}, spinal nerve roots⁴⁴ peripheral nerves⁴⁵ and the autonomic nervous system⁴⁶⁻⁴⁹. Studies of systemic effects of spinal manipulation through nervous system modulation include changes in immune function^{50,51}. Neurophysiological investigations into pain modulation include, spinal cord mechanisms of referred pain and neurologically linked physiological aberrations⁵²⁻⁵⁴.

Numerous biomechanical studies related to subluxation and manipulation have been conducted advancing the science of chiropractic. A major area of chiropractic research has focused on the characterization of the forces applied to the surface of the patient during various adjustive procedures⁵⁵⁻⁶⁰, others investigators have evaluated loads and displacements used to measure the mechanics of spinal segments⁶¹⁻⁶⁸. The mechanical effects of cavitation and the audible release accompanying high velocity low amplitude thrust procedures have also been studied⁶⁹⁻⁷³.

These investigations, primarily conducted by chiropractors are but a small part of basic science research that validates chiropractic theories. Studies conducted by basic scientists in other related fields have provided considerable support beyond the studies mentioned here. Knowledge gained by basic science models has yielded information on subluxation not available by measurements on living humans.

The most compelling evidence for chiropractic care comes from clinical trials that evaluate the effectiveness of spinal manipulation for neuromusculoskeletal conditions. Over 40 clinical trials of spinal manipulation for the treatment of low back pain have been conducted. These have been subjected to evaluation of methodological quality⁷⁴ and meta-analysis⁷⁵. This has led to acceptance of manipulation as a viable alternative to allopathic care in the treatment of acute low back pain. Chronic low back pain while subjected to less scrutiny, has also demonstrated significant response to chiropractic manipulation^{76,77}. Evidence from clinical trials also supports the treatment of neck pain with manipulation⁷⁸⁻⁸⁰. Benefit from cervical manipulation has also been demonstrated from headache trials studying tension⁸¹⁻⁸³, migraine^{84,85} and cervicogenic types⁸⁶⁻⁸⁸.

Non musculoskeletal conditions for which clinical trials of varying rigor supporting chiropractic intervention include obstetric and gynecologic disorders (such as dysmenorrhea and premenstrual syndrome)⁸⁹⁻⁹⁴, and pediatric conditions, (such as: colic⁹⁵, otitis media^{96,97}, and hyperactivity⁹⁸). Trials of chiropractic care of other conditions have demonstrated mixed results. Hypertension studies involving adults demonstrated both short-lived reductions^{99,100} and no significant alteration¹⁰¹ in blood pressure readings. Studies of children with enuresis have demonstrated both the effectiveness of chiropractic treatment¹⁰² and no efficacy beyond the natural history of the condition¹⁰³. Asthma trials studying both children and adults have shown positive results^{104,106}, no significant improvement¹⁰⁷, and both no benefit¹⁰⁸, and a significant decrease in nighttime symptoms¹⁰⁹, in the same study.

In addition to the clinical trials previously mentioned, a variety of methods have been used for outcomes research including community based trials, observational studies and cross sectional surveys all of which provide supporting data. Among the community based trials the Meade studies reported greater effectiveness of chiropractic care for low back pain compared to hospital-based physical therapy^{110,111}. Observational studies of chiropractic care designed to assess patient outcomes for low back pain have been reported¹¹²⁻¹¹⁸. Cross-sectional studies of chiropractic have evaluated care-seeking for acute and chronic low back pain^{110,111}. Physicians' beliefs and behaviors regarding management of low back pain¹¹⁹ and patient's satisfaction with the care provided have also been studied^{120,121}. A preliminary study suggests that geriatric patients under chiropractic care are more apt to report better health status, more likely to exercise vigorously, and more likely to be mobile in the community¹²².

This discussion has not included many of the cohort studies, case series or case reports that document the effectiveness of chiropractic care. There is evidence from these types of studies also contributes to chiropractic science. In addition these studies provide clues as to the direction of future chiropractic research. Agendas for prioritizing future research related to chiropractic theories and practice are conducted nationally on an annual basis¹²³, and internationally on a biannual basis¹²⁴. Regular research conferences that present the results of chiropractic are held world wide including those sponsored by the Foundation for Chiropractic Education and Research (The International Conference on Spinal Manipulation), and the World Federation of Chiropractic.

There is little doubt that evidence from clinical trials clearly supports the treatment of low back pain by chiropractors¹²⁵. Evidence for the treatment of neck pain¹²⁶ and headaches⁸¹⁻⁸⁸ is also convincing. Although both clinical experience and expert opinion in the chiropractic, osteopathic, and medical literature¹²⁷⁻¹³¹ suggest an observable link between manipulation and improvement in at least some non-musculoskeletal conditions clinical trials lag far behind actual practice. To date at least 73 randomized clinical trials of a broadly defined spinal manipulative procedure have been reported in the English language literature. No trial to date has found manipulation to be statistically or clinically less effective than the comparison treatment.¹³² Causation related to subluxation remains to be demonstrated. It is imperative to remember that lack of evidence does not constitute evidence against, while further research accumulates in the field of chiropractic science.

The Clinical Art of Chiropractic

Chiropractic practice is fundamentally patient centered and pragmatic, based on empirical results. This patient centered orientation as opposed to an illness orientation has traditionally been central to the clinical art of chiropractic¹³³. Coulehan¹³⁴ states that chiropractors do not subtract the patient to get to the disease as if peering through a translucent screen to find a disease entity within. He also states that the application of this clinical art is a matrix of acceptance, validation, explanation and treatment.

The sense of acceptance or positive regard for a patient is considered one of the core qualities necessary for patient-doctor interaction¹³⁴. Validation includes acknowledging the patient's perceptions, values, health care preferences and expectations. Genuineness both as the ability to be oneself in a relationship without hiding behind a role or facade¹³⁴, and genuine caring¹³⁵ have also been noted as prominent in chiropractic care.

Chiropractic art includes a clear and understandable explanation of the patients condition¹³⁴. This explanatory model is mechanistic, holistic and based on science. Additionally, it is based on a logical set of beliefs presented in scientific terminology, promoting a natural noninvasive approach to healing¹³⁵. It includes stressing influences on health, "drugless" treatment and a positive, dynamic view of the healthy state¹³⁵. Patients are encouraged to take responsibility for their health and enter into a partnership in decision making¹⁵. Chiropractors strive to develop a positive image of patients' personal control over their health that requires commitment and cooperation¹³⁵.

Primary to the chiropractic explanatory model is the emphasis that the chiropractic adjustment facilitates a change in physiology which can translate into improved health. Traditional chiropractic thought explains this phenomenon as the body's innate capacity for healing. Additionally chiropractic art includes enhancing patients' focus on their health. Current understanding of biopsychosocial factors explains how the chiropractor strengthens patients' belief that they will recover and is considered to be included in the chiropractic clinical art¹³⁵. Chiropractors seek to create conditions in their patients that

are conducive to the liberation of patient's innate recuperative capacities, thus enabling them to return to their optimal state of health¹⁵.

Chiropractic treatment is characterized by advanced skill in manual procedures. The level of skill necessary to perform a successful adjustment requires years of training in the art of palpation and adjusting. Both the chiropractic examination and treatment involves extensive "laying on of the hands"¹³⁵. Mastery of chiropractic technique procedures utilizes the healing power of touch, adding comfort to the clinical action of the treatment.

Beyond the skills of patient evaluation and diagnostic testing germane to portal of entry providers, much of the art of chiropractic involves the location and correction of subluxation. This includes the skill at analysis used to locate the subluxation, the specific adjustive technique used to reduce or correct the subluxation, and the assessment used to determine the type of future care. Chiropractic adjustive procedures are specific and include high velocity low amplitude thrust techniques (manipulation), mechanically assisted techniques, light touch techniques, soft tissue techniques and reflex procedures

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REFERENCES

1. Vear HJ: Chiropractic Standards of Practice and Quality of Care. Aspen Pub Gaithersburg MD. 1992.
2. Haldeman S, Chapman-Smith D Peterson DM: Guidelines for Chiropractic Quality Assurance and Practice Parameters. Proceedings of the Mercy Center Consensus Conference Gaithersburg MD. Aspen Pub . 1993.
3. Practice Guidelines for Straight Chiropractic (Proceedings of the International Straight Chiropractic Consensus Conference), Chandler AZ. World Chiropractic Alliance 1983.
4. Shekelle PG, Adams AH, Chassin MR, Hurwitz EL, Park RE, Phillips RB, Brook RH: The Appropriateness of Spinal Manipulation for Low Back Pain. Indications and Ratings by a Multidisciplinary Panel. 1991 RAND Santa Monica, CA. Pub No. R-4025/2CCR/FCER.
5. Shekelle PG, Adams AH, Chassin MR, Hurwitz EL, Park RE, Phillips RB, Brook RH: Spinal Manipulation for Low-Back Pain. Indications and Ratings by an All-Chiropractic Panel. 1992 RAND Santa Monica CA. R-4035/3-CCR/FCER.
6. Bigos S, Bower O, Braen G et al. Acute Low Back Problems in Adults Clinical Practice Guideline No. 14. 1994 AHCPR Publication No. 95-0642. Rockville, MD; Agency for health Care Policy and Research, Public Health Service, U.S. Department of Health and Human Services.
7. Recommended Protocols and Guidelines for the Practice of Chiropractic. International Chiropractic Association Arlington VA 1999.
8. Kent C, Boone WR, Rondberg TA: Clinical Practice Guideline: Vertebral Subluxation in Chiropractic Practice. No 1 1998 Council on Chiropractic Practice. Chandler AZ.
9. Rubenstein HM: Wellikoff RJ: Practice Guidelines and Parameters for the State of Florida. 1996 Florida Board of Chiropractic
10. IOM Committee on Clinical Practice Guidelines provisional assessment instrument
11. Cates JR, Young DN, Guerriero DJ, Et al: Evaluating the quality of clinical practice guidelines. J Manipulative Physiol Ther 2001; 24:170-75.
12. Oregon Chiropractic Practice and Utilization Guidelines. 1991 Oregon Board of Chiropractic Examiners. Salem OR.
13. Henderson D, Chapman-Smith D, Mior, Vernon H: Clinical Guidelines for Chiropractic Practice in Canada. Canadian Chiropractic Association. Toronto Ont. 1993.
14. Gatterman MI, Hansen DT. Development of chiropractic nomenclature through consensus. J Manipulative and Physiol Ther 1994 17; 302-309.
15. Gatterman MI: A patient centered paradigm: A model for chiropractic education and research. J Alter Complement Med: Research on Paradigm, Practice and Policy. 1995 1:415-432.
16. Gatterman MI: A patient centered paradigm: A shared model for complementary care. Proceedings of World Med 96. Washington. The World Congress of Complementary Therapies in Medicine. 1996 .
17. Sackett DL: Evidence-based medicine. Spine 1998; (23) 10: 1085-1086.
18. Coulehan JL: Chiropractic and the clinical art. Soc. Sci. Med. 1985;21:383-390.
19. Kelner M, Hall O, Coulter I: Chiropractors, Do They Help? A study of their education and practice. Toronto: Fitzhenry and Whitehead, 1980.
20. Jamison JR: Clinical Communication: the essence of chiropractic: J Chiro Human 1994; 4:26-35.
21. Smith R: Where is the wisdom: The poverty of medical evidence. BMJ 1991; 303:798-789.
22. Gatterman MI, Dobson TP, LeFevbre R. Chiropractic quality assurance: standards and guidelines. J CCA 2001; 45;11-17.
23. Kuhn TS: The Essential Tension. University of Chicago Press. Chicago IL. 1977.
24. President's consensus statement: Association of Chiropractic Colleges 1997.
25. Audi R: The Cambridge Dictionary of Philosophy. Cambridge MA. Cambridge University Press. 581-582. 1995.
26. Palmer DD. The Chiropractor's Adjuster: The Science, Art and Philosophy of Chiropractic. Portland Printing House. Portland OR 1910.
27. Toulmin S: Concepts of function and mechanism in medicine and medical science. In Englehardt HT, Spicker S ed. Evaluation and Explanation in the biomedical Sciences.

28. Cannon WB: The Wisdom of the Body, 2nd ed. New York, Norton 1939.
29. Blalock JE, Smith EM: A complete regulatory loop between the immune system and neuroendocrine systems. *Fed Proc* 1985 44: 108-11
30. Coulter ID. An institutional philosophy for chiropractic. *Chiro J Aust* 1991; 21:136-41.
31. Goldstein M The research status of spinal manipulative therapy. Bethesda, MD: US Public Health Service, National Institute of Neurological and Communicative Disorders and Stroke. 1975. Publication No. NIH76-998.
32. Giles LGF, Taylor JR, Cockson A: Human zygapophyseal joint synovial folds. *Acta Anat.* 1986 126;110-114.
33. Giles LGF: Pathoanatomic studies and clinical significance of lumbosacral zygapophyseal (facet) joints. *J Manipulative Physiol Ther* 1992 15:36-40.
34. Bachop W, Janse. The corporotransverse ligament at the L5 intervertebral foramen (abstract). *Anat Tec* 1983 205.
35. Bachop WE, RO CS: A ligament separating the nerve from the blood vessels at the L5 intervertebral foramen. *J Bone and Joint Surg* 1984 8:437.
36. Giles LGF, Kaveri MJP: Some osseous and soft tissue causes of human intervertebral canal (foramen) stenosis. *J Rheumatology* 1990 17:1474-81
37. Giles LGF ligaments traversing the intervertebral canals of the human lower lumbosacral spine. *Neuro-Orthopedics.* 1992 13:25-38
38. Giles LGF: A histological investigation of human lower lumbar intervertebral canal (foramen) dimensions. *J Manipulative Physiol Ther* 1993 15 551-555.
39. Cramer GD, Howe J, Glenn WV, Greenstein J, Potvin W: Morphometric comparison of computed tomography to magnetic resonance imaging in the evaluation of the lumbar intervertebral foramina. *Clin Anat* 1994 7:173-180.
40. Bowen v, Cassidy JD: Macroscopic and microscopic anatomy of the sacroiliac joints from embryonic life until the eighth decade. *Spine* 1981 6:620-628.
41. Vernon H: Basic scientific evidence for chiropractic subluxation. In Gatterman MI ed *Foundations of Chiropractic Subluxation*. St. Louis, Mosby . 1995 36-55.
42. Giles GF, Taylor JR: Innervation of human zygapophyseal joint synovial folds. *Acta Orthop Scand* 1987 58:43-46.
43. Giles LGF: The relationship between the medial branch of the lumbar posterior primary ramus and the mamillo-accessory ligament. *J Manipulative Physiol Ther.* 1991 14:189-192.
44. Olmarker K, Kiuchi S, Rydevik: anatomy and physiology of spinal nerve roots and the results of compression and irritation. In Giles LGF, Singer KP eds: *Clinical Anatomy and the Management of Low Back Pain*. Oxford Butterworth-Heinemann 1997 243-253.
45. Triano JJ, Lutges M. Subacute intermittent mechanical irritation of the sciatic nerve of mice. *J Manipulative Physiol Ther* 1980 3:75-80.
46. Sato A, Swenson R: Sympathetic nervous system responses to mechanical stress of the spinal column in rats. *J Manipulative Physiol Ther* 1984 7: 144-147.
47. Giles LGF: Paraspinal Ganglion distortion due to vertebral body osteophytosis: a cause of vertebrogenic autonomic syndromes? *J Manipulative Physiol Ther* 1992 15: 551-555.
48. Cauwenbergs P: Vertebral subluxation and the anatomic relationship of the autonomic nervous system. In Gatterman MI ed: *Foundations of Chiropractic: Subluxation* St Louis, Mosby 1995 235-266.
49. Jinkins JF: The pathoanatomic basis of somatic. Autonomic and neurogenic syndromes originating in the lumbosacral spine. In Giles LGF, Singer KP eds. *Clinical Anatomy and Management of Low Back Pain*. Oxford Butterworth -Heinemann 1991 243-253.
50. Brennan PC, Kokjohn K, Kaltinger CJ et al Enhanced phagocytic cell respiratory burst induce by spinal manipulation: potential role of substance P. *J Manipulative Physiol Ther* 1991 14; 399-408.
51. Brennan P C Review of the systemic effects of spinal manipulation. In Gatterman MI ed: *Foundations of Chiropractic: Subluxation*. St. Louis, Mosby 1995 268-278.
52. Gillette RG: Spinal cord mechanisms of referred pain and related neuroplasticity. In Gatterman MI ed.: *Foundations of Chiropractic: Subluxation*. St. Louis, Mosby 1995 280-301.

53. Christiansen J, Meyer J altered metabolic enzyme activities in fast and slow twitch muscles due to induced sciatic neuropathy in the rat. *J Manipulative Physiol Ther* 1987 10:227-231.
54. Hu JW, Yu X-M Vernon H Sessle BJ: Excitatory effects on neck and jaw muscle activity of inflammatory irritant injections into cervical paraspinal tissues. *Pain* 1993 55:243-250.
55. Adams AA, Wood J: Forces used in selected chiropractic adjustments of the low back: a preliminary study. *Research Forum* 1984 1:5-9.
56. Adams AA, Wood J Changes in force parameters with practice experience for selected low back adjustments. *Research Forum* 1985 1:40-48.
57. Cohen E, Triano JJ, McGregor M Papakyriakou M: Biomechanical performance of spinal manipulation therapy by newly trained vs. practicing providers: does experience transfer to unfamiliar procedures? *J Manipulative Physiol Ther* 1995 18:347-352.
58. Hessell BW, Herzog W Hasler EM: Experimental measurement of the force exerted during spinal manipulation using the Thompson technique. *J Manipulative Physiol Ther* 1990 13:448-453.
59. Kawchuck GN, Herzog W, Hasler EM: Forces generated during spinal manipulative therapy of the cervical spine: a pilot study. *J Manipulative Physiol Ther* 1992 15:275-278.
60. Herzog W, Conway PJ, Kawchuk GN, Zhang Y, Hasler EM: Forces exerted during spinal manipulative therapy. *Spine* 1993 18: 1206-1212.
61. Triano JJ, Shultz AB: Transmitted loads during lumbosacral SMT. *Proceedings of the International Conference on Spinal Manipulation* 1994:53-54.
62. Gudavalli MR, Cox JM, Cramer GD, Baker JA, Patwardhan AG: Intervertebral disc pressure changes during low back treatment procedures. *International Conference on Spinal Manipulation* 1998 111-113.
63. Kirstukas SJ, Backman JA: Measurement of loads during unilateral thoracic manipulation. *International Conference on Spinal Manipulation* 1998 121-123.
64. Gudavalli MR, Triano JJ, Patwardhan AG, Havey R, McGregor M: Biomechanics of the atlanto-axial joint during vertebral artery provocation test. *Adv Bioeng* 1995 29:321-322.
65. Herzog W, Kawchuck GN, Conway PJ, Zhang YT: Biomechanical studies of spinal manipulative therapy (SMT): quantifying the movements of vertebral bodies during SMT. *JCCA* 1995 38:11-24.
66. Gal JM, Herzog W, KawchuckGN, Coneay PJ, Zhang YT: Forces and relative vertebral movements during SMT to unembalmed post-rigor human cadavers: Peculiarities associated with joint cavitation. *J Manipulative Physiol Ther* 1995 18:4-9.
67. Breen AC, Aillen R, Morris A. Spine kinematics: a digital videofluoroscopic technique. *J Biomed Eng* 198911:224-228
68. Triano JJ Schultz AB: Motions of the head and thorax during neck manipulations. *J Manipulative Physiol Ther* 1994 17: 573-583.
69. Sandoz R: The significance of the manipulative crack and of other articular noises. *Ann Swiss Chirop Assoc* 1969 4-47.
70. Herzog W Zhang YT Conway PJ, Kawchuck GN: Cavitation sounds during spinal manipulative treatments. *J Manipulative Physiol Ther* 1993 16; 523-526.
71. Conway PJ, Herzog W, Zhang Y, Hasler EM, Ladly K: Forces required to cause cavitation during spinal manipulation of the thoracic spine. *Clin Biomech* 1993 16:210-214
72. Brodeur R: The audible release associated with joint manipulation. *J Manipulative Physiol Ther* 1995 18;155-64.
73. Conway PJ Herzog W, Suter E: The frequency response of cavitation caused by spinal manipulation. *Proceedings International Conference on the Spine* 1998 102-104.
74. Koes B W, Bouter LM, VanMameren H, Essers et al: Methodological quality of randomized clinical trials of treatment efficacy in low back pain. *Spine* 1995 20:228-235.
75. Anderson R, Meeker WC, Wirick BE et al: A meta-analysis of clinical trials of spinal manipulation. *J Manipulative Physiol Ther.* 1992 15: 181-194.
76. Cassidy JD, Kirkaldy-Willis WH: Manipulation. In Kirkaldy Willis WH: *Managing Low Back Pain* 2nd ed. New York, Churchill Livingstone 1988 287-296.

77. Triano JJ, McGregor M Hondras MA, Brennan PC: Manipulative therapy vs. education programs in chronic low back pain. *Spine* 1995 20: 948-955.
78. Sloop PR, Smith DS, Goldenburg E, Dore C: Manipulation for chronic neck pain. A double blind controlled study. *Spine* 1982; 7: 532-535.
79. Cassidy JD, Lopes AA, Yong-Hing: The immediate effect of manipulation versus mobilization of pain and range of motion in the Thor. 15: 570-575.
80. Koes BW: Bouter LM, Van Mameren H: et al A randomized clinical trial of manual therapy and physiotherapy for persistent back and neck complaints: sub group analysis and relationship between outcome measures. *J Manipulative Physiol Ther* 1993 16:211-219.
81. 81.Boline P, Kassak K, Bronfort G, Anderson AV: Spinal manipulation vs amyltryptoline for the treatment of chronic tension type headaches: a randomized clinical trial. *J Manipulative Physiol Ther* 1995 18: 148-154.
82. Hoyt W et al Osteopathic manipulation in the treatment of muscle-contraction headache. *J Am Osteopath Assoc.* 1979 322-325.
83. 83.Mootz RD, Dhimi MSI, Hess JA et al: Chiropractic treatment of chronic episodes of tension type headache in male subjects: a case series analysis *JCCA* 1994 38:152-159.
84. 84.Tuchin PJ: A case series of migraine changes following a manipulative therapy trial. *Australasian Chiropractic and Osteopathy* 1997 6:85-91.
85. 85.Nelson CF, Bolin P: The efficacy of spinal manipulation, amitriptyline and the combination of both therapies for the prophylaxis of migraine headaches. *J Manipulative Physiol Ther.* 1998 21:511-519.
86. 86.Vernon H: Spinal manipulation and headaches of cervical origin. *J Manipulative Physiol Ther* 1989 12:455-468.
87. 87.Whitingham W Ellis WB, Milyneux TP: the effect of manipulation (toggle recoil) for headaches with upper cervical joint dysfunction: a pilot study. *J Manipulative Physiol Ther* 1994 17: 369-375.
88. 88.Nilsson N, Christensen HW, Hartvigsen J: The effect of spinal manipulation in treatment of cervicogenic headache. *J Manipulative Physiol Ther* 1997 20:326-330.
89. Liebl NA, Butler LM: A chiropractic approach to the treatment of dysmenorrhea. *J Manipulative Physiol Ther* 1990 13:101-106.
90. Stude DE: The management of symptoms associated with premenstrual syndrome. *J Manipulative Physiol Ther* 1991 14: 209-216.
91. 91.Kokjohn K: Schmidt DM, Triano JJ, Brennan PC: The effect of spinal manipulation on pain and prostaglandin levels in women with primary dysmenorrhea. *J Manipulative Physiol Ther* 1992 15: 279-285.
92. 92.Boesler D, Warner M, Alpers Finnerty EP, Kilmore MA: Efficacy of high-velocity low amplitude manipulative technique in subjects with low back pain during menstrual cramping. *J Am Osteop Assoc* 1993 93:203-214.
93. Walsh MJ: Polus B Chandraraj S: The efficacy of chiropractic therapy on premenstrual syndrome: A case series study. *Chiro J Aust.* 1994 24:122-124.
94. Wittler M: Chiropractic approach to premenstrual syndrome (PMS). *J Chiro Research Clin Investigation.* 1992 8:26-29.
95. Klougart N, Nilsson N Jacobsen I: Infantile colic treated by chiropractors: a prospective study of 316 cases. *J Manipulative Physiol Ther* 1989 12: 281-288.
96. Deganhardt B F, Kuchera MI: Efficacy of osteopathic evaluation and manipulative treatment in reducing the morbidity of otitis media in children. *J Am Osteop Assoc* 1994 4: 673
97. Froehle RM: Ear infection: A retrospective study examining improvement from chiropractic care and analyzing for influencing factors. *J Manipulative Physiol Ther* 1996 19: 160-177.
98. Gliesen J M, Center DB, Leach RA: An evaluation of chiropractic manipulation as a treatment for hyperactivity in children. *J Manipulative Physiol Ther* 1989 12; 353-363.
99. Yates RG, Lamping DL, Abram NL, Wright C: Effects of chiropractic treatment on Blood pressure and anxiety: a randomized controlled trial. *J Manipulative Physiol Ther* 1989 12 484-488.
100. Goertz C, Mootz R: A review of conservative management strategies in the care of patients with essential hypertension *J NMS system.* 1993 1;91-108.
101. Wagnon R, Sandefur R Ratliff C: Serum aldosterone changes after specific chiropractic manipulation. *Am j Chiro Med* 1988 1;66-69.

102. Reed WR, Beavers S, Reddy SK, Kern G: Chiropractic management of primary nocturnal enuresis . J Manipulative Physiol Ther 1994 17: 596-600.
103. Kreitz BG, Aker: Nocturnal enuresis: treatment for the chiropractor. J Manipulative Physiol Ther 1994 17:465-73.
104. Killinger L Chiropractic care in the treatment of asthma Palmer j research 1995 2:74-77.
105. Bronfort G, Evans R, Kubic, P et al: The role of chiropractic treatment in chronic childhood asthma: a pilot and feasibility study for a randomized clinical trial. Proceedings of the International Conference on Spinal Manipulation. 1998 59-61.
106. Hayek R: Asthma and chiropractic. An Australian trial. (single blind cross over study) Proceedings of the International Conference on Spinal Manipulation..
107. Nielsen NH et al: Chronic asthma and chiropractic spinal manipulation: a randomized clinical trial. Clinical Experim Allergy. 1995 25:80-88.
108. Balon J, Aker PD, Crowther E, et al: A comparison of active and simulated chiropractic manipulation as adjunctive treatment for childhood asthma. N Engl J Med. 1998 339: 1013-1020.
109. Balon J, Aker PD Crowther E, et al A randomized controlled trial of chiropractic spinal manipulation in children with chronic asthma. American Thoracic Society Convention, San Francisco 1997 : poster presentation.
110. Meade TW, Dyer S, Browne W et al: Low back pain of mechanical origin: randomized comparison of chiropractic and hospital outpatient treatment. BMJ 1990 300: 349-37
111. Meade TW, Dyer S, Browne W et al: Randomized comparison of chiropractic and hospital outpatient management for low back pain: results from extended follow up. BMJ 1995 311:349-51.
112. Bronfort G: Chiropractic treatment of low back pain: a prospective survey. J Manipulative Physiol Ther 1986 9:99-113.
113. Cox J, Feller JA: Chiropractic treatment of low back pain: a multicenter descriptive analysis of presentation and outcome in 424 consecutive cases. JNMS 1994 2:178-90.
114. Chiropractic Services Pilot Program Evaluation : Washington DC: United States Department of Veterans Affairs 1990. SDR no 86-09 (Final Report).
115. Triano JJ, Hondras MA, McGrogan M: Differences in treatment history with manipulation for acute, subacute, chronic and recurrent spine pain. J Manipulative Physiol Ther 1992 15:24-30.
116. Waalen DP: Demographic and clinical characteristics of chiropractic patients: a five year study of patients treated at the Canadian Memorial Chiropractic Col. JCCA 1994 38: 75-82.
117. Carey TS, Evans A, Hadler N et al: Care seeking among individuals with chronic low back pain. Spine 1995 20:312-317.
118. Carey TS, Evans, A, Hadler N et al: Acute severe low back pain. Spine 1996 21:339-44.
119. Cherkin DC, MacCornack FA, Berg OA: Managing low back pain: a comparison of the beliefs and behaviors of family physicians and chiropractors. West j Med 1988 149:475-480.
120. Cherkin DC, MacCornack FA: Patient evaluation of low back pain care from family physicians and chiropractors. West j Med 1989 150: 351-355.
121. Sawyer CE, Kassak K: Patient satisfaction with chiropractic care. J Manipulative Physiol Ther 1993 16:25-32.
122. Coulteer I, Hurwitz EL, Armonow HU, Cassata DM, Beck JC: Chiropractic patients in a comprehensive home-based geriatric assessment, follow-up and health promotion program. Top Clin Chiro 1996 3:46-55.
123. Hawk C, Meeker W, Hansen D: The National Workshop to Develop the Chiropractic Research Agenda. J Manipulative Physiol Ther 1997 20: 147-149.
124. Chiropractic Research Agenda, International Conference on Spinal Manipulation Vancouver British Columbia. 1998.
125. The Royal College of General Practitioners, Clinical Guidelines for the Management of Acute Low Back Pain, 1997.
126. Hurwitz EL, Aker PD, et. Al.: Manipulation and mobilization of the cervical spine: a systematic review of the literature. Spine 1996 21:1746-1759.
127. Leach RA: The Chiropractic Theories 3rd ed, Williams and Wilkins, Baltimore. 1994
128. Lewit K: Manipulative Therapy in the Rehabilitation of the Motor System, London, Butterworths. 1987
129. Kunert W: Functional disorders of internal disorders due to vertebral lesions. Ciba Symposium 1965 13:85-96.

130. Grieve GP Common Vertebral Joint Problems 2nd ed. Churchill Livingstone , Edinburgh 1988.
131. Stoddard A: Manual of Osteopathic Practice 2nd ed Hutchinson, London. 1983.
132. Meeker WC, Haldeman S. Chiropractic: A Profession at the crossroads of mainstream and alternative medicine. Am Col Physic-A Soc Int Med 2002; 136:216-27.
133. Firman GJ: Goldstein MS: The Future of chiropractic: A psychosocial view. N Eng J Med. 1975; 293:639-642.
134. Coulehan JL: Chiropractic and the clinical art. Soc. Sci. Med. 1985; 21: 383-390.
135. Coulehan JL: The treatment act: An analysis of the clinical art of chiropractic. J Manipulative Physiol Ther. 1991 ;14: 5-13.
136. Lee HK, Gatterman MI: Chiropractic adjusting techniques: The rock that anchors chiropractic. In Peterson D, Wiese G: Chiropractic: An Illustrated History. St Louis MO. Mosby 1995 240-261.

Standards of Quality

1. The patient centered chiropractor acts first and foremost in the patient's interest.
2. The patient centered chiropractor approaches the patient as a whole being.
3. The patient and patient-centered chiropractor act as partners in decision making that encourages the patient to take responsibility for his/or her health.

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CHAPTER 1

PATIENT-DOCTOR RELATIONSHIP

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Section 1

INTRODUCTION

Relationships are the bedrock of all interchanges between two people, and in general, involve caring, feeling, trust, power, and a sense of purpose.¹ In a patient centered relationship the purpose is to help the patient. The helping relationship is founded on: empathy, congruence, genuineness, respect, positive regard, caring and concern for the other.¹ Chiropractors offer a patient centered form of clinical care that exhibits these characteristics.²⁻⁴ The partnership arrangement, also characteristic of patient centered care, demands a sharing of power and control between the patient and doctor.¹ The resulting alliance enhances patients' sense of control over themselves. Tools for refining patient centered care in the chiropractic consultation can influence the locus of control in the patient-chiropractor relationship and enhance the patient's sense of congruency.⁵

The shift to patient centered care is reflected in the current trend in terminology, referring to the patient-doctor relationship instead of the doctor-patient relationship.^{1, 6-9} Studies have found significantly greater patient satisfaction with chiropractic care over other practitioners treating similar conditions.^{2, 10, 11} The patient-doctor relationship plays an important part in patient satisfaction.¹

Section 2

PATIENT'S RIGHTS AND RESPONSIBILITIES

Awareness of patients' rights has been heightened with the rise in health care consumerism.^{1, 12} An increase in patient participation in the patient-doctor encounter has evened the power relationship with patients demanding the right to become more involved in their own health care decisions.^{1, 12} This has led to more patient autonomy, a more egalitarian relationship, and active participation by patients in making decisions about their health care. The conventional model where the doctor "always knows best" no longer goes unchallenged.¹ Relinquishing power to patients includes acknowledging a patient's bill of rights.

Patient's Bill of Rights

A patient and/or his/her legal representative has the right to:

- receive informed consent regarding procedures, risks and alternatives, and receive answers to questions with respect to treatment;¹³⁻¹⁵
- refuse treatment and accept the potential consequences of that choice after thorough explanation;^{13,15}
- expect reasonable safety insofar as the health care environment is concerned;¹⁵
- be interviewed and examined in surroundings that permit reasonable visual and auditory privacy;¹³⁻¹⁵
- have another person present during examination and/or treatment;¹⁵
- expect that all communications and records pertaining to their care should be treated as confidential;¹³⁻¹⁵
- receive complete, current information concerning diagnosis, treatment, and prognosis in terms reasonably understood;¹³⁻¹⁵
- know the identity and professional status of the individual providing service to them and know who has the primary responsibility for coordinating their care;¹³⁻¹⁵
- expect reasonable continuity of care;^{13,15}
- be fully advised of and accept or refuse to participate in any research project and/or O.B.C.E. approved investigational procedure(s);^{13,15}
- receive and examine an explanation of charges for services rendered;^{13,15}
- receive considerate and respectful care;^{13,14}
- expect not to be denied treatment solely on the basis of race, color, religion or sexual preference.¹⁵

Patient's Responsibilities

A patient and/or his/her legal representative has the responsibility to:

- be honest and forthright with the doctor and office staff and to provide accurate and complete information about present complaints, past illnesses, accidents, hospitalizations, medications and any other information related to his/her health; ^{14,15}
- report to the doctor in a timely manner any new incident, trauma or changes in his/her health condition; ^{15*}
- acknowledge and consider instructions provided by the doctor and/or office staff; ^{14*}
- request clarification about any aspect of his/her care not fully comprehended; ^{14,15*}
- keep scheduled appointments or give adequate notice of delay or cancellation; ^{14*}
- treat doctors and office staff with respect and courtesy. ¹⁴

* Considering the above items, lack of cooperation may cause endangerment to the patient's health and/or impaired results of care. Chiropractors have the right to select their cases and patients. It is permissible for the doctor to discontinue treatment of a patient when the patient fails to cooperate in an agreed upon plan of management. ¹⁶

Section 3

INFORMED CONSENT

Informed consent is the issue pertaining to a patient's right to make a decision about treatment based on adequate foreknowledge or understanding of that treatment and its anticipated outcome.¹⁷⁻²⁴ It is the process of giving patients information needed to make educated decisions concerning their treatment.^{17,19, 25,26} Informed consent serves as an opening for dialogue with the patients and involves them in their care.²⁷ It is the process of effectively communicating with patients in terms they understand, allowing them the opportunity to ask questions.

One of the goals of these guidelines is to inform practitioners about the ethical issues and legal precedents within which they must work. The basic principle of consent is that competent persons have the right to choose what will be done to them. It is the responsibility of the physician to inform the patient, in non-technical terms, of anticipated practices and procedures and to receive the patient's informed consent prior to examination and therapy procedures.¹⁹ When applicable, the physician should also explain reasonable alternative treatments.^{19, 26}

Informed consent can be viewed as an opportunity to establish trust and rapport and to collaborate with patients in the decision-making process. Through informed consent, the chiropractor can strengthen a person's commitment to treatment by promoting understanding of what can be accomplished.²⁵

Informed consent is an important risk management tool.²³ By adding the element of trust and respect for the patient, an atmosphere of joint decision making is created. It gives the practitioner a chance to educate patients about the value of chiropractic and how it may benefit them.

To gain informed consent, Oregon health care practitioners are required to utilize a Procedures, Alternatives, Risks and Questions (PARQ) Conference.²⁸ In this PARQ conference the physician shall explain the following:

- (a) in general terms the procedure or treatment to be undertaken;
- (b) that there may be alternative procedures or methods of treatment; and
- (c) that there are risks, if any, to the procedure or treatment.

After giving the explanation specified above, the physician shall ask the patient if the patient wants a more detailed explanation. If the patient requests further explanation, the physician shall disclose to the patient in substantial detail the procedure, the viable alternatives, and the material risks, unless to do so would be materially detrimental. In determining that further explanation would be materially detrimental, the physician shall give due consideration to the standards of practice of reasonable chiropractic practitioners in the same or a similar community under the same or similar circumstances.²⁸

The essence of informed consent is communication between the patient and doctor, whether written or oral.²⁹ This responsibility should be seen as an ethical, as well as a legal, obligation.²⁶ Therefore, **patient-doctor discussion is the key.**^{12,19-21, 30,31-33} The doctor must be prepared to expand the explanation, if necessary, and the information should be tailored to the patient and the procedure or treatment.

Suggestions for Documenting Informed Consent

Most authorities recommend that informed consent be documented.^{20, 22, 23,34,35} The following methods are offered as options for charting informed consent. However, the practitioner is not limited to these specific suggestions.

1. Patients can be given standardized forms^{17,26,36} which they sign. However, practitioners should not rely exclusively on those forms and must communicate directly with the patients.^{29, 34} The use of a written consent form is at the discretion of the individual practitioner in the State of Oregon.^{16,28} If a written form is used, it must be signed by the patients and included in their record.³⁴
2. The acronym PARQ can be written in the patient's chart indicating that the physician has explained the procedures (**P**), viable alternatives (**A**), material risks (**R**), if any, and asked if the patient has any questions (**Q**). If the patient requests further information, the physician can underline the **PARQ** chart notation to reflect the patient's request and that the physician provided more detailed information.³⁷

It is important to note that consent to have one physician perform a procedure is not consent for any other physician unless the patient agrees to substitute care. The practitioner may make a written entry into the patient's record, or, if a written form is used, the practitioner may wish to include a sentence to address this issue.

There are situations in which the method for obtaining informed consent may need to be modified. For example, each parent of minor children (under 18) has the authority and responsibility to consent to health care for his/her minor children unable to consent for themselves. If the parents are divorced, the noncustodial parent may authorize the physician's treatment in the absence of the custodial parent. In the case of minor parents who cannot consent for either their own care or that of their children, *consent must come from a third party such as a parent, grandparent or legal guardian.*

Section 4

DISCLOSURE AND CONFIDENTIALITY OF RECORDS

"The chiropractic physician shall preserve a patient's medical records from disclosure and will release them only on a patient's written consent stating to whom the records are being released or as required by State or Federal law".³⁸

Confidentiality is an ethical and legal responsibility and is also necessary if practitioners expect individuals to be straightforward and honest. Patients must be confident that information will remain private and secure from public scrutiny. This confidence forms the basis for the principle that all patient-doctor communications are privileged and confidential.^{19,39-43} Practitioners must not disclose whether an individual is, or has been, a patient. This includes disclosing information to the immediate family of the patient, with the exception of a parent or guardian of a minor or person legally declared incompetent.¹⁹ The practitioner is responsible for observing professional and legal requirements of confidentiality, as well as ensuring these requirements are met by any employee involved in the preparation, organization, filing or other handling of patient records.³⁹

Ultimately, patients have the right to have any information pertaining to their health kept confidential and not made available to others without authorization.^{19,38-45} This information remains privileged even after the patient dies.^{19, 41, 43} Even though an individual pays for professional services, they do not own the resulting records.¹⁹ With few exceptions, e.g. federally assisted drug or alcohol abuse programs, patients have the right to copy,^{41,42} inspect,^{41,42} correct, amend, authorize or restrict access,^{19,40-42} be notified of intended disclosures^{19,40-42} and pursue breach of duty remedies with respect to their personal health records.⁴²

There are few exceptions to the rules of disclosure. However, the following situations allow disclosure without permission of the patient:

- response to certain court orders;
- conformity with statutory reporting law, e.g. child,⁴⁵ elderly abuse;
- communicable disease reporting, e.g. TB;
- injuries allegedly resulting from a criminal act, e.g. knife or gunshot wounds;
- cases where an individual threatens harm to themselves and/or others with a reasonable probability they will carry out the threat.⁴⁰⁻⁴³

In the cases of communicable disease where the patient refuses to inform or allow someone else to inform an endangered third party, or when there is a threat of physical violence where a third party may be in danger, the duty for disclosure to both public officials and the third party may exist.^{41, 42}

The State of Oregon has developed a statute encouraging health care providers to adopt voluntary guidelines that will give health care recipients access to their medical records in addition to preserving them from unnecessary disclosure. This statute recommends utilizing a written release authorization form. (See Appendix A)

If, in the professional judgement of a physician, disclosure of a medical record or part of a record would be injurious to a patient, the provider may withhold that record or provide an accurate and representative summary of the information contained in the record. In addition, a health care provider may withhold another provider's record in their possession even after receiving a written release authorization. In either of these situations, the health care provider must disclose

the author and date of the withheld record(s) and/or summary(s), or declare the record provided to be a summary. "A patient may not maintain an action for damages against a health care provider for disclosures made by the health care provider in good faith reliance on a properly executed written release authorization..."⁴⁴

With respect to workers' compensation claims, signed forms 801, 827, 829, and 2837 (Release of Information) give medical providers the authority and responsibility to release relevant medical records to the insurer, the insurer's representative, or the Director of the Department of Consumer and Business Services.⁴⁶

In order to protect the patient's right to privacy, the health care provider must have further specific consent for admitting a non-essential person (e.g. student intern) where privacy may be compromised or when taking pictures for clinical or professional purposes. Like other forms of consent, this should be documented.¹⁹

If information is going to be electronically transferred, a confidentiality statement should be utilized as a cover sheet to preserve confidentiality.^{40, 41, 45} For example,

PLEASE NOTE: The information contained in this transmission is confidential in nature. The information is to be used for its intended purpose only and is to be destroyed after the stated need has been fulfilled. Please deliver IMMEDIATELY to the individual indicated above. If you have received the transmission in error, please notify us immediately by telephone and destroy the transmitted documents.

The health care provider may even want to include in their release of record document a check box that gives the patient the choice to not have their records transmitted electronically as the confidentiality of these systems is somewhat less reliable. The healthcare provider should maintain records of any electronic transmissions and request the receiver to sign and return attached receipts when the data has been received.^{40, 45} The increasing reliance on electronic storage and transmission of health record data requires that the provider take all reasonable precautions to ensure that confidentiality is maintained.⁴¹⁻⁴³

It is the patients' responsibility to be aware of their insurance company's policy with respect to releasing medical records; i.e. who is allowed access to their private health records. In order for the healthcare provider to submit a standard health insurance claim form to an insurance carrier, the patient must "...authorize the release of any medical or other information necessary to process this claim."⁴⁷

Other areas may compromise confidentiality including sign-in sheets, patient files, door/wall hanging file holders, "thank you for referral" cards, etc. Health care providers should establish policies and procedures that ensure reasonable protection of the patients' right to confidentiality in addition to acting as role models by demonstrating their commitment to patient privacy and confidentiality.^{40, 41, 43, 45}

Section 5

DOMESTIC VIOLENCE

Domestic violence is one of the major, serious public health problems affecting families in America and globally.⁴⁸⁻⁵¹ Domestic violence, child abuse and elder abuse are all included in the broader category of family violence.⁴⁹ Most definitions of domestic violence (a.k.a. intimate partner abuse (IPA), intimate partner violence (IPV)) include the following components:

1. ongoing pattern of intentional violent or assaultive or coercive behaviors or tactics.^{48, 51-58}
2. purposeful tactics or behaviors directed at achieving and maintaining power, compliance or control over the victim,^{51,52,57} thereby denying their individual and civil rights.⁵⁶
3. may include any or all of the following:

Physical abuse:⁴⁸⁻⁵⁷

- injuries of a non-accidental or unexplained nature including shaking, slapping, hitting, kicking, punching, choking, biting, throwing, use of conventional and household objects as weapons;⁵²
- injuries commonly targeted to proximal areas so they remain concealed;⁵²
- denial of medical attention, physical needs (food, water, shelter, sleep), access or use of contraceptives or other safe sex techniques;⁵²
- restraint or not allowing victim to leave their room or home;⁵²
- murder.^{52,54-57}

Sexual abuse:^{48-53,56,57}

- rape;⁵²
- making sexual jokes or comments intended to humiliate or demean;⁵²
- forcing any person to watch pornography or others having sexual contact, or participating in prostitution or pornography.⁵²

Emotional or psychological abuse:^{48,50-54,57}

- social isolation or deprivation;^{48, 52, 53, 57}
- verbal abuse or intimidation and threats;^{48,52,53,56,57}
- control by isolation from family and friends;^{52-54,57}
- techniques of coercion or brainwashing designed to use children against a partner; e.g. threatening to take or hurt the children, using children to continue contact through custody or visitation.⁵²

Economic coercion or control:^{48,51,52,54,57}

- in any type of relationship: adult, adolescent, current heterosexual, homosexual including former dating, marriage, and cohabitating.^{48,52,53,58}

Domestic violence is a gender-neutral term and universal problem, which cuts across all racial, socioeconomic, national, religious and ethnic boundaries.^{48,49, 54,57} The overwhelming majority of victims, 90-95%, are women;^{48,49,57} however, expert opinion and initial studies suggest domestic violence among lesbians gay, bisexual and transgender individuals may be comparable to domestic violence perpetrated against heterosexual women.⁵³ There is no standardization of what constitutes a violent act. This results in conflicting estimates of the number of women and men affected by "violence"⁵⁴. There is paucity of data about domestic violence against men.

Statistics

The following statistics help to illustrate the pervasiveness of violence against women:

- estimates of incidents of violence to women range from 1-12 million/year⁴⁸ but the most commonly reported incidence rate is 2-4 million/year; ^{48,51, 54,57}
- prevalence ranges from 20-54% of women experiencing violence in a relationship or lifetime; ^{48,52-54,56,57}
- battering is the single greatest cause of injury to women; ⁴⁸
- 30-75% of women killed in the U.S. are murdered by a domestic partner; ^{48,55}
- 1 in 10 women are in a violent relationship at any given time; ⁴⁸
- 75% of spousal assaults occur at the time of separation or divorce; ⁵⁵
- violence tends to be repetitive and averages six violent episodes/year; ⁴⁹
- 4-24% of pregnant women are physically assaulted; ^{48, 51, 53, 57}
- abuse of women and children occurs concurrently an estimated 30-70% of the time; ^{54,57}

While these statistics are useful to illustrate the magnitude of the problem, they are only estimates. Many cases of domestic violence are unreported or undetected so the true incidence is unknown. ^{48-50,54}

The toll of domestic violence is enormous.^{49,51} It is estimated that 1.8 billion dollars per year are spent directly on health care for victims.⁵¹ In addition to the healthcare cost, there is a high societal cost.⁴⁹ Boys who are reared in violent homes have an increased risk of becoming abusers⁵¹ and girls who witness or experience violence have an increased risk of becoming victims.^{48,51} Children who live in violent homes have higher rates of learning difficulties, decreased academic performance, increased behavioral problems and are more likely to be violent adults.⁵⁷

Chiropractors have the opportunity to play an important role in shaping societal values by naming the disease, domestic violence.⁵⁶ This is a primary responsibility and may allow the survivor to begin seeing his/her situation differently, giving them the opportunity to start taking control of their lives.⁵⁶ The public may come to understand that domestic violence is unacceptable behavior when physicians make it clear that it's important to ask whether an intimate or formerly intimate partner caused injuries.⁵⁶ If the root cause of an incomplete diagnosis, prescription for medication, recurrence of injury, or stress related injuries is domestic violence, the practitioner has the opportunity to protect the patient from escalating risk by addressing this issue.⁵⁶ If the practitioner recognizes and helps a victim with "minor" signs or symptoms of domestic violence, a serious or even fatal episode could be prevented.⁵⁶

For practice tips for identifying and treating the abused patient see Appendix B

Section 6

CHILD AND ELDER ABUSE

Child Abuse

Child abuse and neglect is a problem⁵⁹⁻⁶¹ of "epidemic proportions"⁶² that affected approximately 20,000 Oregon children in 1997 and 1998.⁶² The victim of child abuse is an unmarried person, under the age of 18, who has been non-accidentally physically or mentally injured, negligently treated or maltreated, sexually abused or exploited, or who dies as a result of abuse or neglect.⁶²

Chiropractors observe and treat children on a regular basis. A chiropractor, having reasonable cause to believe any child with whom the chiropractor comes in contact has suffered abuse or any person with whom the chiropractor comes in contact has abused a child, is required by Oregon Law⁶³ to report⁶⁴ orally "by telephone or otherwise to the local office of the State Office for Services to Children and Families (SCF), to the designee of the State Office for Services to Children and Families or to a law enforcement agency within the county where the person making the report is located at the time of the contact." Any report made is subject to confidentiality⁶⁵ and the person making the report may not be sued for making a report in good faith⁶⁶.

Abuse can be classified into four basic categories: ⁶²

- physical abuse;
- neglect;
- mental injury or emotional maltreatment;
- sexual abuse.

ORS 419B.005 defines child abuse as:

"Any assault, as defined in ORS chapter 163, of a child and any physical injury to a child which has been caused by other than accidental means, including any injury which appears to be at variance with the explanation given of the injury." This does not include reasonable discipline unless the discipline results in assault or any of the following conditions:

- "Any mental injury to a child, which shall include only observable and substantial impairment of the child's mental or psychological ability to function caused by cruelty to the child, with due regard to the culture of the child;
- "Rape of a child, which includes but is not limited to rape, sodomy, unlawful sexual penetration and incest, as those acts are defined in ORS chapter 163;
- "Sexual abuse, as defined by ORS chapter 163;
- "Sexual exploitation;⁶⁷
- "Negligent treatment or maltreatment of a child, including but not limited to the failure to provide adequate food, clothing, shelter or medical care that is likely to endanger the health or welfare of the child;
- "Threatened harm to a child, which means subjecting a child to a substantial risk of harm to the child's health or welfare;
- "Buying or selling a person under 18 years of age as described in ORS 163.537."

Elder Abuse (persons 65-years of age or older)

Abuse in its various forms affects our society from children to the elderly. It is estimated that approximately 2.5 million older people are abused each year; however, only about 10% of the cases are reported. Elderly victims of abuse "often have low self-esteem, blame themselves for the abuse, and do not want to admit their vulnerabilities or betray their families," and are usually abused by those with whom they live.⁶⁸ Neglect of, or ridicule toward, an elderly person can frequently be an indicator of elder abuse.

Comparatively, the definitions of abuse for older people are very similar to those for children. As with child abuse, chiropractors have a legal and ethical obligation to report any suspected elder abuse⁶⁹ with confidentiality "to the local office of the Senior and Disabled Services Division or to a law enforcement agency within the county where the person making the report is located at the time of contact."⁷⁰ They may not be sued for such reporting.⁷¹

Section 7

BOUNDARY ISSUES IN THE PATIENT-DOCTOR RELATIONSHIP

Across time and culture there has been recognition of the exceptional power given to physicians by patients and the potential for misuse of that power. A chiropractor, as a fiduciary, provides help and care for the patient.⁷² The patient is protected from abuses of power by the ethics and character of the chiropractor and the prescribed boundaries and roles that define professional behavior.

Boundaries define the expected psychological, physical and social distance between patients and practitioners. They are derived from ethical treatise, cultural morality and jurisprudence.⁷³ Boundaries form protection for the patient so that professional care occurs safely within the unique form of social intimacy of the patient-doctor relationship. Specific to this relationship, “The health and welfare of the patient shall always be the first priority of Chiropractic physicians.”¹⁶

Unprofessional conduct by a chiropractic physician, includes, but is not limited to: “Engaging in any conduct or verbal behavior with or towards a patient that may be reasonably interpreted by the patient as sexual, seductive or demeaning;”⁷⁴ proof of actual injury need not be established.”⁷⁴

Patients who are in pain or who are ill are vulnerable to psychological regression. Transferential dynamics are common in clinical encounters where patients are dependent and physically and emotionally more vulnerable. It is common for patients to be emotionally and/or physically attracted to professionals who care for them. When alerted, physicians should take extra steps to define or clarify the professional relationship. “The chiropractor is the one who must recognize and set the boundaries between the care and compassion appropriate to the chiropractic treatment and the emotional responses that may lead to sexual misconduct.”⁷⁵ The power differential inherent in the patient–doctor relationship makes true consent to sexual contact by the patient impossible.^{72,76}

With the exception of pre-existing consensual relationships, it is clearly unethical to have sexual contact or a romantic relationship with a patient concurrent with the patient-doctor relationship.^{70,76-91} There is a range of opinions with respect to the ability of the patient-doctor relationship to change after care has ended. Some suggest a sexual relationship may never be appropriate⁷⁰, while others indicate an interim period ranging from three months to one year between termination and initiation of a personal intimate relationship.^{77,81}

Even those authorities who indicate that sexual or romantic relationships with former patients may be ethical, prohibit the physician from the following:

- using or exploiting trust, knowledge, or influence of emotions derived from the previous professional relationship;
- using privileged information to meet their personal or sexual needs; and
- abusing authority or power derived from the previous professional relationship.^{74,86}

Where there may be a question as to the status of the patient, i.e. current or former, some licensing boards have chosen to adopt more subjective criteria to determine if sexual misconduct

has occurred. Following are some of the areas of consideration likely to be evaluated by a licensing board to determine the current status of the patient:

- evidence of termination procedures;^{73,74}
- circumstances of cessation or termination;^{74,92}
- time passage since therapy termination;^{74,92}
- nature and duration of therapy;^{73,74,92}
- former client's personal history and/or current mental status;⁹²
- statements and/or actions made by the physician during the course of care suggesting or inviting the possibility of a post termination relationship;⁹²
- likelihood of adverse impact on the person and/or others;⁹²
- transfer of patient's care to another physician;⁷⁴
- the nature of the patient's chiropractic problem;⁷⁴
- extent to which the patient has confided personal and/or private information to the chiropractor;⁷⁴
- degree of emotional dependence on the chiropractor;⁷⁴
- extent of chiropractor's knowledge about the patient;⁷⁴
- any other relevant information.⁷³

Consequences of sexual misconduct for patients of health care professionals have been documented to include:

- distrust and anger toward physicians;
- delays in seeking health care;
- increased depression, shame, guilt;
- psychosomatic symptoms;
- post-traumatic stress disorder (panic attacks, flashbacks, extreme guilt and self-destructive feelings).^{81,93}

Consequences of sexual misconduct extend beyond the patient to potentially affect the patient's family, the doctor's family, the doctor's staff, other patients, the community and the profession.⁸¹ Consequences of sexual misconduct for the chiropractor may include Board sanctions such as license suspension or revocation, probation, chaperone requirements and mandated counseling. Additionally, civil suits or criminal prosecution, extortion or retaliation are possible consequences of unprofessional conduct.

See Appendix C for strategies that may prevent boundary violations and/or allegations of sexual misconduct.

Section 8

THE PATIENT-DOCTOR RELATIONSHIP AND INDEPENDENT EXAMINATIONS

Independent and second opinion examinations are isolated chiropractic evaluations of an individual's health performed by a physician not involved in that person's care.^{94,95} When performed by a chiropractic physician, these may be referred to as IMEs (independent medical examinations) or ICEs (independent chiropractic examinations). All independent examinations performed by a chiropractor to determine the need for chiropractic care shall include a functional chiropractic analysis.⁹⁶ Some combination of the following of the PARTS exam constitutes a functional chiropractic analysis:

- P** Location, quality, and intensity of pain or tenderness produced by palpation and pressure over specific structures and soft tissues;
- A** Asymmetry of sectional or segmental components identified by static palpation;
- R** The decrease or loss of specific movements (active, passive, and accessory);
- T** Tone, texture, and temperature change in specific soft tissues identified through palpation;
- S** Use of special tests or procedures.⁹⁷

In the context of independent examinations the use of an investigational procedure is considered inappropriate.

These types of evaluations may be ordered by treating physicians, employers, patients and their attorneys, insurers, disability management companies and managed care organizations, workers compensation boards, and other entities that make determinations about disability and impairment.⁹⁵ An independent examination may be performed at various stages of an injury or illness and is generally utilized to clarify health and/or job issues.⁹⁵

At the outset of the examination, prior to gathering health information, the examining physician should ensure to the extent possible that the patient understands the ethical obligations of the physician to perform an impartial evaluation. The examiner also explains the differences between the role of independent examiner and the traditional fiduciary role of the physician. The examiner should explain who has requested the examination.

In an independent examination, the patient-doctor relationship is limited because the examiner does not monitor the patient's health over time, provide treatment or fulfill many duties traditionally performed by physicians.⁹⁴ Despite the limited relationship, important health information, diagnosis and treatment recommendations shall be made available to the patient, treating doctor, and patient's legal counsel or guardian via the independent report.^{98,99} Upon request, a copy of the independent report shall be made available to the patient, the treating doctor, and/or the patient's legal guardian.^{98,99}

Section 9

TERMINATION OF THE PATIENT-DOCTOR RELATIONSHIP

Once the patient-doctor relationship has been established, it may be terminated by either party.

Patient Termination

The most common way for patients to end the relationship is their recovery from the condition for which they were receiving chiropractic care.¹⁰⁰ Another way the patient may terminate the relationship is to discharge the physician at any time.¹⁰⁰ If at the time of termination by the patient, it is the opinion of the treating physician that the condition requires further care, it is suggested that the physician notify the patient. This should be documented by the physician.

Physician Termination

Physicians may terminate the patient-doctor relationship at their discretion, but must not abandon the patient. The patient must be given reasonable notice,¹⁶ preferably in writing. By sending the notice "return receipt requested" the physician will have the assurance that the patient was notified. The patient must also be given reasonable time to locate another physician. The courts have held that once a physician has agreed to treat a patient a physician cannot cease his treatment except, first with the consent of the patient, or secondly upon giving the patient time and notice so that he may employ another doctor or thirdly when the condition of the patient is such that medical treatment is no longer required.¹⁰⁰

Abandonment

Abandonment has been defined as "the unilateral severance by the physician of the physician-patient relationship" without reasonable notice, at a time when there is still the necessity of continuing medical attention.¹⁰⁰ Abandonment involves intent on the part of the physician to improperly terminate the patient-doctor relationship.¹⁰⁰ Examples of abandonment include:

- the physician fails to provide adequate withdrawal notice to the patient;
- the physician fails to see a patient within a clinically indicated timeframe;
- the physician withdraws from a patient case without making arrangements for continued care for lack of payment or any other reason.

Physician Substitution/Referral

Physicians are entitled to reasonable time away from their practices as long as arrangements are made for a competent, licensed substitute. Notice must be given to the patient of the substitution, as the patient may prefer to consult with a doctor other than the substitute.¹⁰⁰ If notice is not given and the patient's condition suffers an adverse effect the physician may be held to have abandoned the patient.¹⁰⁰ If the substitute is an "employee" of the physician, standard rules of vicarious liability may apply. If the substitute is unqualified or incompetent the physician may also be liable for the substitute's negligence. In multi-physician practices where each physician sees the others' patients on a rotating basis, none of the physicians can be held to have abandoned a patient if another member of the group or partnership has seen that patient.¹⁰⁰ When a physician refers a patient to a second physician, the referring physician cannot be held liable for abandonment as long as due care is used in selecting the second physician.¹⁰⁰ This referral should be documented by the referring physician

Physicians have the right to make reasonable limitations on their practice.¹⁰⁰ Physicians are not legally obligated to treat any patient beyond the chosen limitations of their practice. In such circumstances, referral to another physician does not constitute abandonment.¹⁰⁰

Section 10

PATIENT-DOCTOR RELATIONSHIP STANDARDS

1. Informed Consent

The patient has the right to informed consent regarding procedures, risks and alternatives, and answers to questions with respect to treatment, in terms that they can be reasonably expected to understand. In order to obtain the informed consent of a patient, the chiropractic physician shall explain the following:

- (a) In general terms the procedure or treatment to be undertaken;
- (b) That there may be alternative procedures or methods of treatment, if any; and
- (c) That there are risks, if any, to the procedure or treatment.²⁸ (Legal Type 1)

2. Patient Confidentiality

The patient has the right to expect that all communications and records pertaining to their care will be treated as confidential.^{19,39,40-43,45} The chiropractor shall preserve a patient's medical records from disclosure and will release specific records only on a patient's written consent stating to whom the records are being released or as required by State or Federal law.³⁸ (Legal Type 1)

3. Abandonment

The patient has the right to continuity of care once the doctor has agreed to treat the patient. The chiropractor may terminate the patient-doctor relationship only when the patient has been given reasonable notice.¹⁶ (Legal Type 1)

4. Patient-Doctor Boundaries

With the exception of pre-existing consensual sexual relationships, it is clearly unethical to have sexual contact or a romantic relationship with a patient concurrent with the patient-doctor relationship. Chiropractors shall not engage in any conduct or verbal behavior with or towards a patient that may be reasonably interpreted by the patient as sexual, seductive or demeaning.^{72,73,77-90} (Legal Type 1)

5. Independent Medical Examinations

All independent and second opinion examinations performed by a chiropractor to determine the need for chiropractic care shall include a functional chiropractic analysis.⁹⁶ A copy of the independent report shall be made available, upon request, to the patient, the patient's attorney and the treating doctor.⁹⁹ All independent and second opinion examiners have an ethical obligation to perform an impartial examination. (Legal Type 1)

6. Child and Elder Abuse Reporting

Chiropractors must report child abuse and elder abuse to the appropriate officials.^{63,69} (Legal Type 1)

REFERENCES

1. Stewart M, Brown JB, Weston WW, McWhinney I, McWilliam CL, Freeman TR. Patient-centered medicine: transforming the clinical method. London: Sage Publications, 1995.
2. Coulehan JL. Chiropractic and the clinical art. *Soc Sci Med* 1985;21(4):383-90.
3. Phillips RB, Mootz RD. Contemporary chiropractic philosophy. In: Haldeman S, ed. *Principles and practice of chiropractic*. 2nd ed. Norwalk, CT: Appleton and Lange, 1992:45.
4. Gatterman MI. A patient-centered paradigm: a model for chiropractic education and research. *J Altern Complement Med* 1995;1(4):371-86.
5. Jamison JR. Tools for refining patient-centered care: a consideration of LOC and SOC in the chiropractic consultation. *Chiro J Aust* 1996;26:118-24.
6. Boon H, Stewart M. Patient-physician communication assessment instruments: 1986 to 1996 in review. *Patient Educ Couns* 1998;35(3):161-76.
7. Virshup BB, Oppenberg AA, Coleman MM. Strategic risk management: reducing malpractice claims through more effective patient-doctor communication. *Am J Med Qual* 1999;14(4):153-9.
8. Wee CC, McCarthy EP, Davis RB, Phillips RS. The patient-physician relationship: physician counseling about exercise. *JAMA* 1999;282(16):1583-8.
9. Petersen DM. Report of my findings: your password to the future (Editorial). *Dynamic Chiropractic* 1999;17(22):3.
10. Cherkin DC, MacCornack FA. Patient evaluations of low back pain care from family physicians and chiropractors. *West J Med* 1989;150(3):351-5.
11. Carey TS, Garrett J, Jackman A, et al. The outcomes and costs of care for acute low back pain among patients seen by primary care practitioners, chiropractors, and orthopedic surgeons. *N Engl J Med* 1995;333(14):913-7.
12. Beisecker AE. Patient power in doctor-patient communication: what do we know? *Health Commun* 1990;2(2):105-22.
13. The American Hospital Association. A patient's bill of rights 1992.
14. ChiroNet policy statement. "Patient rights" and "Patient responsibilities." Portland Oregon. 2002.
15. ICA code of ethics: principle 1E: patient's bill of rights within the health care setting International Chiropractic Association, 1985.
16. Oregon Administrative Rule 811-035-0005 Duties and obligations of Chiropractic physicians to their patients.
17. Grant KD. Informed consent: Medical-legal update for the practitioner on recent judicial opinions applying state laws. *Am Surg* 1992;58(2):146-52.
18. Kent C, Boone WR, Rondberg TA. Clinical practice guideline number 1: vertebral subluxation in chiropractic practice. Chandler, AZ: Council on Chiropractic Practice 1998:95-8.
19. Schafer RC. Chiropractic physician's guide: clinical malpractice. West Des Moines, IA: National Chiropractic Mutual Insurance Company 1983;4-7.
20. Chapman-Smith D, ed. Cervical adjustment. *The chiropractic report* 1999;13(4).
21. Theisler CW. Informed consent: an Australian case study (letter to the editor). *J Manipulative Physiol Ther* 1999;22(2):119.
22. Jamison JR. Informed consent: an Australian case study. *J Manipulative Physiol Ther* 1998;21(5):348-55.
23. Campbell L, Ladenheim CJ, Sherman R, Sportelli L. Informed consent: a search for protection. *Topics in Clinical Chiropractic* 1994;1(3):55-63.
24. Audi R, ed. *The Cambridge dictionary of philosophy: informed consent*. Cambridge: Cambridge University Press, 1995:378.
25. Jensen PS, Josephson AM, Frey J. Informed consent as a framework for treatment: ethical and therapeutic considerations. *Am J Psychother* 1989;43(3):378-86.
26. Vear HJ, ed. *Chiropractic standards of practice and quality of care*. Gaithersburg, MD: Aspen Publishers, 1992:134-5.
27. Epstein RM, Campbell TL, Cohen-Cole SA, McWhinney IR, Smilkstein G. Perspectives on patient-doctor communication. *J Fam Pract* 1993;37(4):377-88.
28. Oregon Revised Statute 677.097 Procedure to obtain informed consent of patient.
29. Colman W. Informed consent: what your patients don't know can hurt you. *The Psychiatric Resident*. Jan/Feb 1994:23-8.
30. Roter DL, Hall JA. Physicians' interviewing styles and medical information obtained from patients. *J Gen Intern Med* 1987;2(5):325-9.
31. Quill TE, Brody H. Physician recommendations and patient autonomy: finding a balance between physician power and patient choice. *Ann Intern Med* 1996;125(9):763-9.
32. Cherkin D, Deyo RA, Berg AO, Bergman JJ, Lishner DM. Evaluation of a physician education intervention to improve primary care for low-back pain I. Impact on physicians. *Spine* 1991;16(10):1168-72.
33. Smith RC, Hoppe RB. The patient's story: integrating the patient- and physician-centered approaches to

- interviewing. *Ann Intern Med* 1991;115(6):470-7.
34. OUM Progress Report. Informed consent: your patient's rights. Bellevue, WA: OUM and Associates 1998;11(3):1-8.
35. Hartley MA. The law and patient consent: its relevance to chiropractors and osteopaths. *J Aust Chiro Org* 1996;5(1):8-11.
36. Steinecke R. Informed consent. *J Can Chiro Assoc* 1996;40(1):43-6.
37. Kailin DC. Acupuncture risk management: the essential practice standards and regulatory compliance. Corvallis OR: CMS Press, 1997:107.
38. Oregon Administrative Rule 811-015-0006 Disclosure of records.
39. Haldeman S, Chapman-Smith D, Petersen DM, eds. Guidelines for chiropractic quality assurance and practice parameters: Proceedings of the Mercy Center Consensus Conference. Gaithersburg, MD: Aspen Publishers, 1993:89-90.
40. American Academy of Pediatrics. Safeguards needed in transfer of patient data: American Academy of Pediatrics Task Force on Medical Informatics, Section on Computers and Other Technologies, Committee on Practice and Ambulatory Medicine. *Pediatrics* 1996;98(5):984-6.
41. Knopp RK, Satterlee PA. Ethical issues in emergency medicine: confidentiality in the emergency department. *Emerg Med Clin North Am* 1999;17(2):385-96.
42. Cassidy SO, Sepulveda MJ. Health information privacy reform. *J Occup Environ Med* 1995;37(5):605-14.
43. Rutberg MP. Medical-legal issues facing neurologists: medical records confidentiality. *Neurol Clin* 1999;17(2):307-13.
44. Oregon Revised Statute 192.525, 1997. State policy concerning medical records; disclosure following written release.
45. Chilton L, Berger JE, Melinkovich P, et al. American Academy of Pediatrics. Pediatric Practice Action Group and Task Force on Medical Informatics: Privacy protection of health information: patient rights and pediatrician responsibilities. *Pediatrics* 1999;104(4):973-7.
46. Oregon Department of Consumer and Business Services: Bulletin No. 281 (Rev.), Apr 1999.
47. Health Insurance Claim Form, HCFA-1500.
48. Olsen EA. Identifying and responding to the battered woman. *JNMS* 1996;4(2):45-51.
49. U.S. Preventive Services Task Force. Guidelines from guide to clinical preventive services. Section I. Screening. Part I. Mental disorders and substance abuse. Screening for family violence. 2nd ed. Williams & Wilkins, 1996.
50. Haile-Mariam T, Smith J. Domestic violence against women in the international community. *Emerg Med Clin North Am* 1999;17(3):617-30.
51. Salber PR, Taliaferro E. Domestic violence. In: Rosen, ed. Emergency medicine: concepts and clinical practice. 4th ed. Mosby-Year Book, Inc.1998: 2908-21.
52. Armatta J, Erde K, Frisch P, et al. Recognizing abuse: health care provider's guide to identifying and treating domestic violence. Oregon Medical Association, Oregon Association of Hospitals and Health Systems, Professionals in Partnership, Mar 1996.
53. Alpert E, Bleiberg MS, Campbell JC, et al, advisory committee. Preventing domestic violence: clinical guidelines on routine screening. The Family Violence Prevention Fund, Oct 1999.
54. Haywood YC, Haile-Mariam T. Violence against women. *Emerg Med Clin North Am* 1999;17(3):603-15.
55. Resnick PJ, Scott CL. Legal issues in treating perpetrators and victims of violence. *Psychiatr Clin North Am* 1997;20(2):473-87.
56. Abbott J. Injuries and illnesses of domestic violence. *Ann Emerg Med* 1997;29(6):781-5.
57. El-Bayoumi G, Borum ML, Haywood Y. Domestic violence in women. *Med Clin North Am* 1998;82(2):391-401.
58. Stringham P. Domestic violence. *Primary Care* 1999;26(2):373-84.
59. Freitag R, Lazoritz S, Kini N. Psychosocial aspects of child abuse for primary care pediatricians. *Pediat Clin North Am* 1998;45(2):391-402.
60. Kocher MS, Kasser JR. Orthopaedic aspects of child abuse. *J AM Acad Orthop Surg* 2000;8(1):10-20.
61. Bethea, L. Primary prevention of child abuse. *AM Fam Physician* 1999;56(6):1577-1585, 1591-92.
62. State Office for Services to Children and Families, Child Protective Services Section. Recognizing and reporting child abuse and neglect: an explanation of Oregon's mandatory reporting law. Salem, OR: Oregon Department of Human Resources, rev. 10/99.
63. Oregon Revised Statute 419B.010 Duty of officials to report child abuse; exceptions; penalty.
64. Oregon Revised Statute 419B.015 Report form and content; notice to law enforcement agencies and local office of State Office for Services to Children and Families.
65. Oregon Revised Statute 419B035 Confidentiality of records; when available to others.
66. Oregon Revised Statute 419B.025 Immunity of person making report in good faith.
67. Oregon Revised Statute 419B.005 Definitions.
68. Kleinschmidt KC. Elder abuse: a review. *Ann Emerg Med* 1997;30(4):463-72.
69. Oregon Revised Statute 124.060 Duty of officials to report.

70. Oregon Revised Statute 124.065 Method of reporting; content; notice to law enforcement agency and to division.
71. Oregon Revised Statute 124.075 Immunity of person making report in good faith; identity confidentiality.
72. Stahl MJ, Foreman SM. Sexual misconduct: ethical, clinical and legal ramifications and the chiropractic profession. National Chiropractic Mutual Insurance Company 1997.
73. Linklater D, MacDougall S. Boundary issues: what do they mean for family physicians? *Can Fam Physician* 1993;39:2569-73.
74. Oregon Administrative Rule 811-035-0015 Unprofessional conduct in the chiropractic profession
75. State of Washington, Department of Health. Sexual misconduct statement and policy of the chiropractic disciplinary board, 1993.
76. Shiel RC. Promoting effective boundaries in doctor-patient relationships. *Chiropractic Technique* 1996;8(2):88-92.
77. Colorado Revised Statute 12-33-117(1)(z),(aa).
78. Australian Medical Association 1995; Sexual conduct between doctors and their patients.
79. Arkansas State Board of Chiropractic Examiners. Rules and Regulations. C.2.(p)(i).
80. College of Chiropractors of Alberta. Policy on sexual abuse/impropriety; Mar/Apr 1993.
81. Robinson GE, Stewart DE. A curriculum on physician-patient sexual misconduct and teacher-learner mistreatment. Part 1: content *Can Med Assoc J* 1996;154(5):643-9.
82. McCullough LB, Chervenak FA, Coverdale JH. Ethically justified guidelines for defining sexual boundaries between obstetrician-gynecologists and their patients. *Am J Obstet Gynecol* 1996;175(2):496-500.
83. Twemlow SW. Exploitation of patients: themes in the psychopathology of their therapists. *Am J Psychother* 1997;51(3):357-75.
84. Kagle JD, Giebelhausen PN. Dual relationships and professional boundaries. *Soc Work* 1994;39(2):213-20.
85. Blackshaw SL, Patterson PGR. The prevention of sexual exploitation of patients: educational issues. *Can J Psychiatry* 1992;37:350-3.
86. Overlock ME, Gonzales RJ. Crossing a patient's sexual boundaries. *Tenn Med* 1996;89(11):403-4.
87. Foote W, Rovics C. Licensing boards and sexual misconduct. Oregon Attorney General's Public Law Conference, 1999.
88. Enbom JA, Thomas CD. Evaluation of sexual misconduct complaints: the Oregon Board of Medical Examiners, 1991 to 1995. *Am J Obstet Gynecol* 1997;176(6):1340-8.
89. Cullen RM, Northwood BR. Medical discipline and sexual activity between doctors and patients. *N Z Med J* 1995;108:481-3.
90. Council on Ethical and Judicial Affairs, American Medical Association. Sexual misconduct in the practice of medicine. *JAMA* 1991;266(19):2741-5.
91. Redleaf A, Baird SA. Behind closed doors: gender, sexuality, and touch in the doctor/patient relationship. Westport, CT: Auburn House, 1998:131-5.
92. Washington Assurance Commission 246-807-311 Sexual misconduct
93. Kluft RP. The physician as perpetrator of abuse. *Primary Care* 1993;20(2):459-80.
94. AMA policy statement 5-10.03: Patient-physician relationships in the context of work related and independent medical examinations. Dec, 1999
95. Peterson KW, Babitsky S, Beller TA, et al. The American Board of Independent Medical Examiners. *J Occup Environ Med* 1997;39(6):509-14.
96. Bergmann TF, Peterson DH, Lawrence DJ. Chiropractic technique New York, NY. Churchill Livingstone, 1993:211.
97. Oregon Administrative Rule 811-010-0093 Guide to policy and practice questions: independent medical examinations.
98. Oregon Administrative Rule 811-010-0005 Definitions.
99. Oregon Administrative Rule 811-015-0006 Disclosure of records.
100. Holder AR. Engle v. Clarke, 346 SW 2d 13, KY 1961.100. The action of abandonment in medical malpractice litigation, 36 Tulane Law Rev, 1962.
101. Epstein RS, Simon RI. The exploitation index: An early warning indicator of boundary violations in psychotherapy. *Bulletin of the Menninger Clinic* 1990;54:450-65.

APPENDIX A

AUTHORIZATION TO DISCLOSE MEDICAL RECORDS

Oregon Revised Statute 192.525, 1997

This authorization must be written, dated and signed by the patient or by a person authorized by law to give authorization.

I authorize _____ (name of hospital/health care provider) to release a copy of the medical information for _____ (name of patient) to _____ (name and address of recipient).

The information will be used on my behalf for the following purpose(s):

By initialing the spaces below, I specifically authorize the release of the following medical records, if such records exist:

- ___ All hospital records (including nursing records and progress notes)
- ___ Transcribed hospital reports
- ___ Medical records needed for continuity of care
- ___ Most recent five year history
- ___ Laboratory reports
- ___ Pathology reports
- ___ Diagnostic imaging reports
- ___ Clinician office chart notes
- ___ Dental records
- ___ Physical therapy records
- ___ Emergency and urgency care records
- ___ Billing statements
- ___ Other

___ Please send the entire medical record (all information) to the above named recipient. The recipient understands this record may be voluminous and agrees to pay all reasonable charges associated with providing this record.

- ___ *HIV/AIDS-related records
- ___ *Mental health information
- ___ *Genetic testing information

*Must be initialed to be included in other documents.

___ **Drug/alcohol diagnosis, treatment or referral information:

**Federal Regulation, 42 CFR Part 2, requires a description of how much and what kind of information is to be disclosed.

___ This authorization is limited to the following treatment:

___ This authorization is limited to the following time period:

___ This authorization is limited to a worker's compensation claim for injuries of _____ (date).

This authorization may be revoked at any time. The only exception is when action has been taken in reliance on the authorization. Unless revoked earlier, this consent will expire 180 days from the date of signing or shall remain in effect for the period reasonably needed to complete the request.

(Date)

(Signature of patient)

(Date)

(Signature of person authorized by law)

APPENDIX B

PRACTICE TIPS FOR IDENTIFYING AND TREATING THE ABUSED PATIENT

DOMESTIC VIOLENCE

Victim Barriers to Terminating or Disclosing Abusive Relationships

There are many reasons why victims don't report and/or terminate abusive relationships. Such barriers may include the following:

- shame, humiliation, embarrassment; ⁴⁸⁻⁵¹
- psychological repression, poor self-esteem/self-image; ^{48,50,52}
- fear of reprisal, retribution, repercussions, e.g. threats to kill or harm children, family, friends, etc.; ^{48, 49, 51-54}
- fear of abandonment, ⁴⁹ poverty/economic concerns ^{48,50,52,54} loneliness, ⁵² the unknown; ⁵²
- fear of not being believed; ⁵²
- legal consequences; ^{49,50,52}
- religious traditions; ^{48,50,52}
- cultural: social, family, marital expectations; ^{48,50-52}
- feel protective of partner; ⁵¹
- thinks the doctor does not know or care about or can help with domestic violence; ⁵¹
- thinks the doctor is too busy; ⁵¹
- alcohol or drug problems; ⁴⁹
- language barriers; ⁵⁰

Physician Barriers To Screening For/Identifying Domestic Violence

Health care providers identify several reasons why they are reluctant to ask patients about domestic violence. Such barriers to screening/identifying domestic violence may include the following:

- lack of knowledge and training; ^{48,51,54} unprepared to respond; ^{48,51}
- because of the clinical presentation, patients may appear to be neurotic or hypochondriacs; ⁴⁸
- discomfort due to own feelings and reactions to a disclosure of abuse; ⁴⁸
- misconceptions such as abuse is rare, ⁴⁸ private, ^{48,51} the battered victim's fault, ^{48,51}
- opening up a "can of worms" or "Pandora's box;" ^{48,51,54}
- fear of offending the patient; ^{49,51,54,57}
- inability to "fix" abusive relationships; ^{49,51}
- time constraints/lack of time to deal with the problem; ^{49,51,54,57}
- personal bias against women in international community, ⁵⁰ racial prejudice; ^{50,54}
- sexism; ^{50,54}
- frustration with outcome, don't think it will help and "she'll just go back to him;" ^{51,57}
- physicians' beliefs or values about abuse; ⁵⁴
- loss of control or feelings of powerlessness; ⁵⁴
- belief that a victim can leave if he/she just wants to; ⁵¹
- knowing the assailant and not believing he is capable of abuse. ⁵¹

Patterns of Abuse

There is no single model which can describe all domestic violence patterns. ⁴⁸ However, it is useful to consider the following models to conceptualize the abuse process in women.

One model describes a cycle of violence in phases where phase one begins with a minor battering/assault which gradually increases tension in the relationship. The victim may try to decrease the tension but is largely unsuccessful. ⁴⁸ Phase two involves a discharge of building tension resulting in an acute battering incident which may be met with disbelief or denial and is dismissed by the victim as an isolated incident. Subsequent episodes are met with shock, rationalization, self blame, denial and repression. ⁴⁸ Phase three is often referred to as the "honeymoon phase" ⁴⁸ where the abuser expresses remorse, exhibits attentiveness, reaffirms love and promises it will never happen again. ^{48,57} This is done mostly out of fear of being caught. ⁴⁸ There is not always a honeymoon phase. ⁴⁸

Another model highlights the roles of violence and withdrawal where some lesser degree of violence creates emotional withdrawal in the attacked partner. The abuser may be met with withdrawal the next time upset, needy or in want of support. This in turn provokes a more violent attack, which is followed by further withdrawal and/or fear. The escalating cycle of neediness is met with increasing withdrawal until the violence becomes severe.⁵⁸

In addition to the physical violence, emotional abuse always accompanies and typically precedes physical violence.⁴⁸ This cycle of violence is repetitive, escalates in severity and frequency^{48,49,57,58} and is used to gain compliance or control over the victim.⁵¹

Profile of the Abuser

Battering and abuse are learned behaviors that result from being personally abused or witnessing abuse.^{48,51} Abusers may be characterized by any or all of the following:

- extreme jealousy and possessiveness;⁴⁸
- inefficient coping skills;⁴⁸
- thinking they are unique and don't have to follow rules;⁴⁸
- justifying behavior with excuses blaming others for causing their behavior;⁴⁸
- viewing others as holding them back from being successful;⁴⁸
- minimizing abuse as part of avoiding responsibility for violent actions;⁴⁸
- having trouble experiencing close, satisfying relationships with others;⁴⁸
- substituting drama and excitement for closeness;⁴⁸
- being secretive, closed minded, self righteous;⁴⁸
- seeking to gain power and control;^{48,54,57}
- fragmentation (Dr. Jekyll and Mr. Hyde) using a public face that is childlike, dependent, insecure, charming, affectionate, seductive or manipulative;⁴⁸
- alcohol use or abuse involved^{48,49,52,54-57} but not established as causal.^{48,52}

Women at Increased Risk for Domestic Violence

There is no specific highly predictive profile of women at increased risk for domestic violence; however, following are some generalizations about vulnerabilities:

- witness or experience family violence as a child or adolescent;^{48,49,51,57} however, the majority did not grow up in abusive homes;⁴⁸
- under 35 years of age;^{49,54,57}
- refugee, migrant^{50,54} living in rural or remote areas,⁵⁰ homebound;⁵⁰
- conflicting evidence about minorities being more vulnerable;^{50,57}
- lower socioeconomic status^{50,54,57} or education;⁴⁹
- pregnancy;⁵⁷
- mental illness, physical disabilities;⁵⁴
- unmarried;⁴⁹
- unmarried couple living together;⁵⁸
- wives in marriages where their education or occupation level is higher than their spouse;⁵¹
- mixed marriages (religion or race);⁵¹
- history of alcohol abuse by male partner;⁵⁴
- recently separated or divorced.⁵⁷

Presentation

The majority of domestic violence presentations are not "injuries," but are seen for non-traumatic diagnoses.^{48,51,54} Chiropractors should be aware that chronic pain^{51,52,56,57} or back pain itself⁴⁸ may be the result of domestic violence. Other clinical findings that may suggest need for further investigation include the following:

1. Injuries

- explanation for injuries does not fit injuries observed;^{48,49,51,56}
- multiple injuries in various stages of repair;^{48,51,52}
- assaultive trauma, most commonly head, face, neck and areas covered by clothing; mandibular fractures; facial fractures; trunk trauma; blows to abdomen or other areas; other blunt trauma or injuries suggestive of defensive posturing like forearm fractures;^{49,51,52,56,58}
- "accident prone" history.^{51,52}

2. Pain

- chronic pain; ^{51,52,56,57}
- back pain; ⁴⁸
- chest pain; ^{48,51,52,57}
- pain from diffuse trauma without visible evidence. ⁵²

3. Somatic Complaints

- headaches; ^{48,51,52,57}
- choking sensation; ⁴⁸
- hyperventilation; ^{48,57}
- gastrointestinal symptoms; ^{48,51,52,57}
- sexual dysfunction; ⁵²
- neurologic concerns, syncope, ⁵⁷ paresthesias, ⁵¹ dizziness; ^{51,52}
- palpitations; ^{51,52,57}
- chronic non-specific medical complaints often presumed to be psychosomatic; ^{48,51,57}
- sleep disturbance, e.g. insomnia; ^{48,51,52,57}
- fatigue, decreased energy, difficulty concentrating; ^{51,52}
- dyspnea; ^{51,52}
- upper respiratory tract infections, bronchitis; ^{54,56}
- poor control of diabetes, hypertension, heart disease. ⁵¹

4. Obstetric, Gynecologic Problems

- miscarriages; ^{48,49,52,57}
- injured pregnant woman ^{49,51,52,57} or fetus; ^{51,57}
- register late ^{49,52,57} or no prenatal care; ⁵¹
- pre-term labor; ^{49,51,52}
- low birth weight infants; ^{49,57}
- spontaneous abortions; ^{51,52}
- frequent urinary tract infections or vaginitis; ⁵²
- dyspareunia; ⁵²
- pelvic pain; ^{48,51,52}
- injuries to breasts, abdomen or genitals; ⁵²
- substance abuse, poor nutrition and/or inadequate weight gain during pregnancy. ⁵²

5. Emotional and Behavioral or Psychological Sequelae of Violence

- depression; ^{48,49,51-53,57}
- suicide attempts; ^{48,49,51,52,56,58}
- anxiety; ^{48,51,52,57}
- mental illness; ⁴⁸
- inability to cope; ⁵²
- nervous behavior, lack of eye contact, worrying about staying too long in office, frequent comments that she has to check with her partner, comments that partner is jealous, financial dependence, shy, frightened, embarrassed, noncompliant, evasive, passive, cries; ⁴⁸
- poor self-esteem, social isolation; ^{48,52}
- hovering (batterer accompanies victim to monitor what is said); ⁴⁸
- post-traumatic stress reactions/disorder; ^{49,52,57,58}
- panic disorders; ^{51,52}
- eating disorders; ^{51,52,57}
- drugs and alcohol abuse. ^{48,49,51-53,56-58}

6. Other

- more likely to be prescribed analgesics, minor tranquilizers ^{48,52,57} and antidepressants; ⁴⁸
- multiple visits ⁵⁶ or frequent visits without physiologic abnormality; ⁵²
- long term disability from injuries; ⁵⁸
- homelessness or welfare. ⁵⁸

Screening and Identification

Physicians routinely screen for problems less prevalent than domestic violence, and yet routine screening for domestic violence is rarely practiced.^{48,49,53} This is especially true in the primary care setting where it is estimated that less than 10% of primary care physicians routinely screen for domestic violence during a regular office visit.⁵³ Battery is so prevalent that physicians in an entry-level health care system have an ethical obligation to consider abuse as a possibility in their evaluation of female patients.^{48,52} Screening is simply asking the patient a few direct questions. The goal of screening is not for the physician to “fix” the problem but to identify the abuse and provide appropriate education, support, and referrals, and to acknowledge and validate the situation as real and dangerous.^{48,52} Before initiating any discussions about domestic violence, the physician must put the patient in a position to disclose this information safely and confidentially (without partner and/or children present).^{48,51,54-57} The FAMILY VIOLENCE PREVENTION FUND recommends screening begin as early as age 14.⁵³ It is recommended that all female patients are screened whether signs or symptoms are present or not and whether abuse is suspected or not.

Battered women/victims favor routine questions about domestic violence and expect their physicians to initiate discussions about it.^{48,49} While many find it difficult to volunteer the information, most women are willing to discuss issues about violence if specifically asked. Questions should be direct, sensitive, empathetic, nonjudgmental and asked in a confidential setting.^{48-50,52,57} It is recommended that direct questions about abuse be included in the routine history^{49,52,57} as no one can be excluded from screening.⁵⁶ This is because the prevalence is so high,^{49,54,56} the prevalence of undetected cases is high,^{48,49,57} and there is no, or low, positive predictive presentations for the presence of domestic violence.^{48,52,54,57} In addition, screening for abuse should be considered for each new complaint or when the patient has a new intimate partner.⁵³

Phrasing Questions

An easy way to introduce the topic is a statement such as “Because violence is so common, I’ve begun to ask about it routinely” or “I’ve begun to ask all my patients about it.”^{52,53} This may then be followed by one of the following or similar questions:

- “Are you in a relationship with a person who physically hurts or threatens you?”⁵³
- “Have you been hit, kicked, punched or otherwise hurt by someone in the past year?”^{52,53,58} If so, by whom?”⁵⁴
- “At anytime has your partner or anyone at home hit, hurt or frightened you?”⁵³

Patient Denies Abuse or Does Not Want To Discuss The Topic

When patients’ deny abuse or are reluctant to discuss the topic, they should not be badgered.^{48,54} Providing a list of local programs presents a less threatening resource than face to face confrontation while still providing support for the patient.^{52,54} It is appropriate, however, to make further inquiries with more specific questions when the patient answers “no” or will not discuss the topic if there are signs and/or symptoms strongly indicating abuse.⁵² Some examples of this follow:

- “It looks as though someone may have hurt you. Could you tell me what happened?”⁵²
- “Sometimes when people come for healthcare with physical symptoms like yours, we find that there may be trouble at home. We are concerned that someone is hurting or abusing you. Is this happening?”⁵²
- “Sometimes when people feel the way you do, it’s because they may have been hurt or abused at home. Is this happening to you?”⁵²

Patient Acknowledges Abuse or Wants To Discuss the Topic

When the patient acknowledges abuse or wants to discuss the topic, it is important to listen non-judgmentally^{51,52,54} and assure the patient that the disclosure is confidential.^{48,53} In addition, validation^{48,52,54,57} of their position with any of the following statements provides further support:

- “No one deserves to be hurt or threatened with violence.” (The most important and easily provided intervention is this simple message.)^{48,54}
- “You are not to blame for the behavior of the perpetrator.”⁵⁴
- “You are not alone.”⁵²
- “You aren’t crazy.”⁵²
- “What happened to you is wrong.”⁵²
- “Help is available.”⁵²
- “I have treated others with this problem and am comfortable dealing with it.”⁵²

It is important to educate the patient^{48,49,54,57} about the escalating cycle of abuse (nature and course)^{48,49,57} which not only produces serious medical problems^{48,57} but is also a criminal act^{48,54} for which there are protective service agencies and legal assistance, e.g. civil protection orders/restraining orders, criminal prosecution, civil litigation, etc.^{49-52,54,55,57}

Legible, accurate, detailed and complete documentation by the physician is invaluable for legal purposes.^{51,52,54} This may provide the only evidence that abuse has taken place⁵¹ and improves the likelihood of successful prosecution.⁵⁴ Good records also frequently substitute for personal appearance by the physician in a legal setting.⁵⁷ It may be reasonable to establish a “confidential” file set for domestic violence cases in order to further limit access and protect the confidentiality of the patient. Along with the medical information, the file should include the arrival date and time, name, address, phone number of anyone with the victim and the address where the incident occurred.⁵² It is appropriate to begin with an all inclusive medical, trauma and relevant social history,⁵² in addition to a history of the incident using the patient’s own words^{48,51,52,54} with modifiers such as “the patient states...”^{48,51} when possible. A list of complaints and symptoms^{52,55} should be obtained and a complete physical examination including neurological examination, radiographic evaluation, and rape assessment, if appropriate,⁵² should be performed. If any special services aren’t available in the physician’s office, referral to an appropriate facility for documentation is indicated. (See Appendix D) Body diagrams/maps^{48,49,54} may be useful for documenting a detailed description of the injuries including extent,⁴⁸ resolution/acuity,^{48,52} measurements/size,^{48,52} type, number, and location.⁵² Results of laboratory testing, diagnostic imaging or other diagnostic procedures should be included in the chart. The physician should document whether the injuries are consistent with the patient’s explanation.⁵²

If possible, photographs should also be included because they are particularly valuable as evidence.⁵⁴ Prior to taking photographs, written informed consent should be obtained^{48,52,58} in addition to having a female chaperone present.⁴⁸ If available, a digital camera has the greatest versatility for documenting visible injuries. Two views of each injury should be taken, including a measuring device^{51,52} and at least one picture with the patient’s face for identification.^{51,52} The photographs should be marked with the following information: name of patient, photographer, witnesses,^{51,52} time,^{48,52} place,⁴⁸ chart/record number,⁵¹ and date and signature of the photographer.^{48,58} The photographs should be placed in a sealed envelope with the patient’s name and social security number and put in a safe place.⁴⁸ If a standard camera is used, label the films and keep secure until developed⁵¹ at which time 2-3 copies should be made.

If the police are involved, the investigating officer and any action taken should be documented if possible.⁵² The police should only be called with the patient’s documented consent; however, there are some exceptions where reporting is mandatory, which include the following:

- If there is evidence of injury by gunshot, knife or other deadly weapon.^{51,55,57,58}
- Child abuse, elder abuse or neglect.^{62,69}
- Where there is a duty to protect a potential third party victim from danger.^{48,51,52,55} According to the *Tarasoff* case of 1976, if it is determined the patient presents a serious danger of violence to another, the health care provider is obliged to use reasonable care to protect the intended victim against such danger via notification of the intended victim, notification of the police or taking whatever steps reasonably necessary under the circumstances. Sixteen states have adopted Tarasoff limiting statutes, which only require reporting when there is an explicit threat made.⁵⁵ “In Oregon, the duty to warn is **not** clear. In the case of possible domestic violence, the physician, **upon advice of legal counsel**, should err on the side of caution and warn the at-risk spouse or partner.”⁵²

It is very important to include an assessment of the patient’s danger and fear.^{48,51,52,54,57,58} To evaluate the patient’s level and immediacy of danger, it may be helpful to ask some further questions,⁴⁸ as the most critical components of assessment are the patient’s level of fear and appraisal of immediate and future safety.⁵² Following are some questions that may provide further insight to the patient’s position:

- “Are you in immediate danger?” “What do you think will happen when you go home?”^{48,54} (This is one of the most important questions: “Is it safe to go home?”⁵¹)
- “Is another violent attack imminent?”⁴⁸
- “How frequent and severe are the attacks?”^{48,51} “Are they escalating?”^{51,52}
- “Do they have a firearm or deadly weapon?”^{48,51,52,54}
- “Is there a history of violent behavior outside the home⁵¹ or history of violent acts or threats using a weapon?”^{51,58}
- “Have they threatened to kill you^{48,51,52} or you them?”^{48,51}
- “Is there drug or alcohol use?”^{48,51,58} as this makes behavior less predictable.⁴⁸

- “Have there been threats to children?”^{48,52,54,58}
- “Are you, or a partner, threatening suicide and if so, is there a suicide plan?” If so, the situation is urgent.^{48,51,52}
- “Are there forced unwanted types of sex or refusing to use birth control?”⁵³
- “Is there humiliation, swearing, name calling, mental instability, obsession with victim,^{51,58} drug/alcohol use or abuse?”⁵⁸
- “Are there threats to injure self or patient,⁵² reporting to immigration or stalking?”⁵⁸
- “Is there isolation which includes controlling access to friends and family and limiting outside involvement?”^{51,53,58}
- “Has there been destructive behavior such as destroying patient’s property, injuring pets of patient or child?”⁵⁸
- “Does the abusive partner control all the money?”^{51,58}

Appropriate treatment for the patient’s injuries should be provided⁵² as well as appropriate referrals for support. (See Appendix D) In addition, it is important to discuss alternatives in a safe place,^{51,56,57} giving the patient an opportunity to decrease the sense of isolation and lack of power.⁵⁷ The patient may or may not be in immediate danger and may or may not want access to a shelter. Based on these criteria, additional decision-making and appropriate action may proceed.

If the patient is in immediate danger, it should be determined if there are family or friends to stay with⁵⁰⁻⁵² or if immediate access to a shelter^{51,52,57} or police contact is wanted.^{52,54} An opportunity should also be given to use a private phone to assist with any/all of the above.⁵²

If there is no immediate danger or the patient doesn’t want immediate access to a shelter, the chiropractor may offer written information about shelters and other community resources^{48-52,54,55,57} or instructions how to find this information in the phone book.⁴⁸ Shelters and affiliated agency referrals should be made carefully and only to those dedicated to assisting battered women.⁴⁸ Affiliated agencies and community resources may include the following: children’s services, counseling, legal and employment services⁵⁴ and law enforcement.^{50,51} With respect to legal needs, possibilities are criminal prosecution, civil litigation,^{52,57} civil protection/restraining orders,^{51,52, 57} temporary custody, and mandatory payment of rent or mortgage.⁵⁴ It is important to remember that written information may be dangerous for the patient to possess.^{48,52} The patient should not be forced to take written information. The number of a local hotline or other information may be most safely given on a prescription blank or appointment card.⁵²

The victim should be assisted in developing a safety plan^{48,50-52,54,57,58} with which they can prepare for future situations as well as make judgments about the safety of their current situation. This should be an ongoing process where questions such as “Is it safe to go home?”^{48,51,54} can help the victim to regularly assess their safety status. Identification of potentially dangerous situations and appropriate responses increase the preparation and safety when or if the risk of violence increases.^{48,50} Options should include planning for immediate relocation to a shelter⁵⁷ and/or seeking shelter and financial help from family and friends.⁵⁰⁻⁵² If possible, three options should be included for emergencies where shelters may be full, family and friends are out of town, etc. Victims should be given information directly and/or made aware of how to access available resource numbers for assistance.^{48-52,54,55,57} A packed overnight bag⁵⁷ or “flight kit” which may be an unused suitcase placed in a well-hidden area⁵² should include as many of the following items as possible: enough money to get started, clothing, medicine, address book, car/house keys, valuables, books, children’s toys, papers (social security card, health insurance information, birth certificates, driver’s license, restraining order, etc.).⁵⁸

In the case where no apparent emergent situation exists and the patient is returning home, a follow up appointment should be scheduled.⁴⁸

Despite the limited and imperfect options for detecting and intervening in domestic violence situations, the benefits are substantial for families in which the cycle of abuse is interrupted.⁴⁹ Patients should not leave the health care facility without knowing that battering is a crime and there is help in the judicial system.⁵⁴ It would be useful for the physician to be familiar with, or help develop, a network with physicians, and community referral resources (shelters, legal services, law enforcement, district attorney’s office, etc.) as this can be extremely effective in developing a coordinated response to meet the complex needs of battered women.⁵¹

Educational Materials for the Health Care Providers

Chiropractors can increase public awareness about domestic violence,^{48,57} show willingness to discuss the topic,⁴⁸ and help women understand the problem⁵⁰ by having pamphlets, posters, etc. in the office. This is an important form of intervention and prevention.⁵⁷ There should be materials from community resources relating to domestic violence in the waiting room, examination room, female restrooms and other strategic locations.^{49,51,57} It is also

important to support culturally sensitive publications in different languages for women in the international community as it is more difficult for them due to cultural, religious, social, family, legal and immigration reasons.⁵⁰

Child Abuse

The various forms of abuse have potential physical and behavioral indicators.⁶²

(A) Physical abuse, possible physical indicators;

- bruises and welts on the body;
- bruises and welts reflecting the shape of an object used (electrical chord, belt buckle);
- various types of burns (cigarette, rope, etc.);
- laceration;
- fractures.

Physical abuse, possible behavioral indicators:

- wary of adult contacts;
- apprehensive when other children cry;
- behavioral extremes;
- frightened of parents;
- afraid to go home.

(B) Neglect, possible physical indicators:

- consistent hunger, poor hygiene, inappropriate dress;
- consistent lack of supervision;
- unattended physical and/or emotional problems or medical needs.

Neglect, possible behavioral indicators:

- begging, stealing food;
- extended stays at school;
- poor school performance;
- fatigue;
- alcohol or drug abuse;
- delinquency.

(C) Mental injury or emotional maltreatment, possible physical indicators:

- failure to grow;
- speech or sleep disorders;
- forced to dress in "opposite sex" clothing.

Mental injury or emotional maltreatment, possible behavioral indicators:

- behavior extremes: aggression or withdrawal;
- habit disorders (sucking, biting, rocking);
- attempted suicide;
- conduct disorders (antisocial, runaway, destructive behavior);
- emotionally needy.

(D) Sexual abuse, possible physical indicators:

- difficulty in walking or sitting;
- pain or itching in the genital area;
- bruises, bleeding or infection in external genital area;
- venereal disease;
- pregnancy.

Sexual abuse, possible behavioral indicators:

- withdrawal, fantasy or infantile behavior;
- poor peer relationships;
- delinquent or runaway;
- reports sexual assault (children seldom lie about sexual abuse);
- refer also to behavioral indicators of mental injury or emotional maltreatment.

Elder Abuse

Observations suggestive of elder maltreatment include: ⁶⁸

(A) General

- absence of caregiver or abandonment;
- poor supervision;
- recent conflicts or crises;
- medication problems (duplications or unusual dosages);
- recurrent healthcare admissions or visits;
- delay in seeking care;
- unexplained injuries;
- inconsistent histories between patient and caregiver.

(B) Patient

- fearful of caregiver.

(C) Patient or caregiver

- depressed;
- reluctant to answer questions.

Physical indicators of elder abuse:⁶⁸

(A) Physical abuse

- unexplained bruises, wounds, burns, or other injuries;
- rope or restraint marks on wrists and/or ankles.

(B) Psychological abuse

- habit disorder (sucking, rocking);
- neurotic disorders (antisocial, borderline).

(C) Neglect

- dehydration or malnutrition;
- poor hygiene;
- inappropriate dress;
- unattended physical or medical needs.

APPENDIX C

STRATEGIES THAT MAY PREVENT BOUNDARY VIOLATIONS AND/OR ALLEGATIONS OF SEXUAL MISCONDUCT

A. Office Procedures

- provisions for chaperones as needed;
- provisions for patient modesty (privacy when disrobing, draping, etc);
- patient bill of rights;
- staff communication;
- staff availability near treatment rooms;
- consent to treat minors;
- documentation of incidents;
- follow-up/response to complaints;
- termination or referral of patients.

B. Staff Education

- sexual harassment policy;
- expectations regarding communication and behavior in the office;
- not discussing intimate subjects, personal problems or lives with patients;
- confidentiality;
- socializing with patients.

C. Self Assessment Tools to Analyze Risk

- Risk factor analysis (See Appendix E) ⁹¹
- The Exploitation Index: An early warning indicator of boundary violations in psychotherapy. (See Appendix F) ¹⁰¹

D. Access to Mentors or Second Opinions

Doctors are often isolated in practice. An experienced colleague or counselor can provide insight, and help with difficult and/or sensitive issues that arise in practice.

E. Patient Education/Orientation

- chaperone option offered to patient;
- query patients regarding their concerns;
- pamphlets, videotapes, report of findings, PARQ conference (see Section 3);
- clinic procedure regarding disrobing, gowning, and draping.

F. Identification of High Risk Situations for the Chiropractor

- attraction to a patient;
- personal relationship problems;
- times of emotional distress;
- substance abuse;
- burn-out.

G. Recognition of High Risk Patient Behaviors

- inappropriate gifts, cards or correspondence;
- inappropriate “personal” comments and questions;
- sexual innuendo and humor;
- seductive clothing or behavior;
- seeking inappropriate extended visits and/or care.

APPENDIX D

DOMESTIC VIOLENCE RESOURCES

NATIONWIDE DOMESTIC VIOLENCE 24-HOUR TOLL-FREE HOTLINE: 800-799-SAFE
TDD number for the hearing impaired: 800-787-3224 (non-English translators available)

ASHLAND

- Dunn House 541-779-4357

ASTORIA

- Clatsop County Women's Crisis Service 503-325-5735

BAKER CITY

- May Day, Inc. 541-523-4134

BEND

- Central Oregon Battering and Rape Alliance 541-389-7021 / 800-356-2369

BURNS

- Harney Helping Organization (HHOPE) 541-573-7176

COOS BAY

- Coos County Women's Crisis Center 800-448-8125

CORVALLIS

- Center Against Rape & Domestic Violence 800-927-0197

ENTERPRISE

- Safe Harbors 541-426-6565

EUGENE

- Family Shelter Network 541-689-7156
- Sexual Assault Support Services 541-343-7277 / 800-788-4727
- Womenspace 800-281-2800

FLORENCE

- Siuslaw Area Women's Center 541-997-2816

GRANTS PASS

- Women's Crisis Support Team 541-474-1400 / 800-750-9278

GRESHAM

- Gresham Police Domestic Violence Unit 503-618-2394

HILLSBORO

- Domestic Violence Resource Center 503-469-8620

HOOD RIVER

- Project Helping Hands Against Violence 541-386-6603

KLAMATH FALLS

- Klamath Crisis Center 800-452-3669

LAGRANDE

- Shelter from the Storm 541-963-9261

LAKEVIEW

- Crisis Intervention Center 800-338-7590

LINCOLN CITY

- Women's Violence Intervention Project 541-994-5959

MILL CITY

- Canyon Crisis Service 503-897-2327

MILWAUKIE

- Clackamas Women's Services 503-654-2288

MCMINNVILLE

- Henderson House 503-472-1503

ONTARIO

- Project Dove 541-889-2000

PENDLETON

- Domestic Violence Services 800-833-1161

PORTLAND

- La Linea de Crisis Para La Mujer 503-232-4448 / 800-556-2834
- Men's Resource Center and Women's Agenda Counseling 503-235-3433
- Multnomah County Mental Health Crisis Line 503-215-7082
- Portland Police Domestic Violence Reduction Unit 503-823-0961
- Portland Women's Crisis Line 503-235-5333
- Raphael House Of Portland 503-222-6222
- Salvation Army West Women's and Children's Shelter 503-224-7718
- Volunteers Of America Family Center 503-232-6562
- Yolanda House 503-977-7930
- Bradley-Angle House 503-281-2442
- Council For Prostitution Alternatives 503-282-1082

ROSEBURG

- Battered Person's Advocacy 800-464-6543

SALEM

- Mid-Valley Women's Crisis Service 503-399-7722

ST. HELENS

- Columbia County Women's Resource Center 503-397-6161

THE DALLES

- Haven From Domestic Violence 541-298-4789

TILLAMOOK

- Women's Crisis Center 800-992-1679

UMPQUA

- Lower Umpqua Victims' Services Day: 541-271-0261
Eve: 541-271-2109

VANCOUVER:

- YWCA Safechoice 360-695-0501

UPDATED 12/02

APPENDIX E

An Excerpt of Behind Closed Doors Gender, Sexuality, and Touch in the Doctor/Patient Relationship Angelica Redleaf with Susan A Baird

SEXUAL MISCONDUCT RISK FACTOR ANALYSIS

PURPOSE: The Risk Factor Analysis (RFA) is a tool that can be used to quickly evaluate your current risk level for sexual misconduct.

This questionnaire was created by Ben Benjamin, Ph.D., and Angelica Redleaf, D.C.; some portions are adapted from the article “Are You In Trouble With A Client?” by Estelle Disch, Ph.D., which appeared in *Massage Therapy Journal*, Summer 1992. Ben Benjamin is the director of the Muscular Therapy Institute in Cambridge, Mass. Estelle Disch has practiced for more than 20 years as a clinical sociologist and psychotherapist in Boston, Mass., and is the co-director of BASTA! (Boston Associates to Stop Therapy Abuse).

What is the Risk Factor Analysis?

The RFA asks very specific questions. Some are about stress you may be experiencing in your life or in your practice. Others are about attractions to patients, interactions with patients, and attitudes towards patients. The questions are based on typical kinds of doctor behaviors and attitudes.

The RFA is meant for you to keep to yourself. It can be taken again from time to time – for example, every six months – to give you a quick idea of your risk level. It can be used independently of the Practice Analysis, which includes more general questions about doctor and staff behavior and attitudes.

How does the RFA Differ from the Doctor Self-Analysis?

The RFA and the Doctor Self-Evaluation Questionnaire (DSE) both ask the practitioner to self-evaluate his or her level of risk. The DSE asks general questions about your behaviors, attitudes, skills, and attributes, and about your staff’s behaviors, skills, and attitudes. The RFA asks very specific questions that are designed to give you a quick idea of the level of risk you are incurring by practicing the way that you do.

By comparing your responses to both questionnaires, (see page 158) you will be able to gain a very clear picture of what *you think* about yourself as a practitioner, and of what *you think* about your staff. This information is a good start, but neither of these self-evaluations can see past your own blind spots.

The rest of the Practice Analysis will either confirm, challenge, or illuminate your ideas about yourself as a practitioner, and about your practice as a whole.

Instructions

Place a check-mark next to the number (1, 2, or 3) of each statement that applies to you. When you have completed the questionnaire, add up all of the numbers that are the same – i.e. add up all the number 1s on a page and write that number at the bottom of each sheet, then do the same for all the 2s and 3s on each sheet. Add up the totals for each number on the last page in the space provided. Directions for assessing your RFA numbers are on the next page.

At the end of the self-scoring section, there are guidelines for comparing your RFA results with the results of the Doctor Self-Evaluation and the rest of the Practice Analysis.

RISK FACTOR ANALYSIS QUESTIONNAIRE

1	I want this patient to like me.
1	I like it when my patients find me attractive. I keep this to myself.
2	Sometimes I schedule the patients that I really like last so that I can spend more time with them.
2	I am surprised by how much I anticipate this patient's visit.
2	I think about this patient frequently.
1	I have not been in a relationship in a long time.
1	I feel lonely much of the time, unless I'm working.
2	With certain patients I have trouble asking to be paid.
1	I talk about my personal life to my patients.
2	I find myself working weekends to accommodate a few patients I like.
1	Some of my patients rely on me a lot.
2	I feel as if I am under tremendous pressure.
1	I like it when my patients look up to me.
2	I feel like I have very little to give lately.
2	My relationship with my significant other(s) isn't meeting my needs.
3	I've sometimes touched patients in inappropriate ways.
3	I've had sex with patients.
3	I've had sex with patients in the office.
2	I dress particularly well when I know one or more of my patients has an appointment that day.
1	I fantasize about what it would be like to have sex with some of my patients.
2	I'm not charging one or more of the patients to whom I'm attracted.
2	I have some of my patients take off more of their clothes than they really need to remove.
2	I sometimes sneak looks as patients are undressing.
2	I believe it's okay to date my patients.
2	I sometimes tell dirty jokes to my patients.
2	I like doing treatments in those areas of patient's bodies that are close to their erogenous zones.
2	I compliment patients when I think they look nice.
1	This patient feels more like a friend.
2	I often tell my personal problems to one or more of my patients.
2	I feel sexually aroused by one or more of my patients.
3	I'm waiting to dismiss this patient so that we can become romantically involved.
2	To be honest, I think that good-by hugs last too long with one or more of my patients.
2	Appointments with one or more of my patients last longer than with others.
2	I tend to accept gifts or favors from this patient without examining why a gift was given.

Totals for this page:

1 _____ 2 _____ 3 _____

1	I feel totally comfortable socializing with patients.
1	I have a barter arrangement with one or more of my patients that is sometimes a source of tension.
3	I have had sexual contact with one or more of my patients.
2	I have attended professional or social events at which I knew that this patient would be present.
2	This patient often invites me to social events and I don't feel comfortable saying either yes or no.
2	Sometimes when I'm working on this patient, I feel like the contact is sexualized for myself and maybe for the patient.
2	There's something I like about being alone in the office with this patient when no one else is around.
2	I am tempted to lock the door when working with this patient.
3	This patient is very seductive and I don't always know how to handle it.
2	I have invited this patient to public or social events.
1	I find myself cajoling, teasing, joking a lot with this patient.
3	I allow this patient to comfort me.
3	Sometimes I feel like I'm in over my head with this patient.
2	I feel overly protective of this patient.
3	I sometimes have a drink or use some recreational drug with this patient.
3	I am doing more for this patient than I would for any other patient.
2	I find it difficult to keep from talking about this patient with other people who are close to me.
2	I find myself saying a lot about myself with this patient – telling stories, engaging in peer-like conversation.
3	If I were to list patients with whom I could envision myself in a sexual relationship, this patient would be on the list.
3	I call this patient a lot and go out of my way to meet with him/her in locations convenient to him/her.
2	This patient has spent time at my home.
3	I often tell my personal problems to this patient.
3	I enjoy exercising my power over some of my patients.
3	I'm going through a crisis at this point in my life.
2	Sometimes I'm afraid I might burn out.
3	I need someone to take care of <i>me</i> .
3	If a patient consents to sex, it's okay.

Totals for this page:

1 _____ 2 _____ 3 _____

Totals for both pages:

1 _____ 2 _____ 3 _____

If you have checked off even one number 3: You are at risk. Know that you are a ticking time bomb who could potentially hurt yourself, your patient(s) and your profession! You would be very wise to get help from a therapist, consultant or significant other. You also should consider getting training in this area. Ignoring your high risk or attempting to get through this by yourself might be very unwise.

If you have checked off more than three number 2s: You have the potential for problems. The more number 2s you check off, the more your risk factor increases. You could use some help in getting yourself on track concerning professional boundaries.

If you checked off more than five number 1s: You may be overstepping your professional boundaries. You might not be in danger of overstepping them sexually, but you still could find yourself losing your effectiveness as a health provider. Be aware of your attitudes about patients, yourself, and your practice.

During times of stress and personal loss, we are more likely to overstep our professional boundaries. There are training sessions available that address the questions of boundaries and sexual misconduct, and there are therapists, mentors, friends, and colleagues who could help you at such times. Your risk is greatest when you attempt to go through such a transition all by yourself.

Redleaf A, Baird SA. Behind closed doors: gender, sexuality, and touch in the doctor/patient relationship. Westport, CT: Auburn House, 1998: 131-135.

APPENDIX F

THE EXPLOITATION INDEX

The Exploitation Index: Rate yourself according to the frequency that the following statements reflect your behavior, thoughts, or feelings with regard to any particular patients you have seen in psychotherapy within the past 2 years, by placing a check in the appropriate box. Approximate frequency as follows:

Rarely = about once a year or less Sometimes = about once every 3 months Often = once a month or more

Please give your immediate, "off the cuff" responses:	Never	Rarely (Yearly)	Sometimes (Quarterly)	Often (Monthly)
1. Do you do any of the following for your family members or social acquaintances: prescribing medication, making diagnoses, offering psychodynamic explanation for their behaviors?				
2. Are you gratified by a sense of power when you are able to control a patient's activity through advice, medication, or behavioral restraint? (e.g. hospitalization, seclusion)				
3. Do you find the chronic silence or tardiness of a patient a satisfying way of getting paid for doing nothing?				
4. Do you accept gifts or bequests from patients?				
5. Have you engaged in a personal relationship with patients after treatment was terminated?				
6. Do you touch your patients (exclude handshake)?				
7. Do you ever use information learned from patients, such as business tips or political information, for you own financial or career gain?				
8. Do you feel that you can obtain personal gratification by helping to develop your patient's great potential for fame or unusual achievement?				
9. Do you feel a sense of excitement or longing when you think of a patient or anticipate her/his visit?				
10. Do you make exceptions for your patients, such as providing special scheduling or reducing fees, because you find the patient attractive, appealing or impressive?				
11. Do you ask your patient to do personal favors for you? (e.g. get you lunch, mail a letter)				
12. Do you and your patients address each other on a first-name basis?				
13. Do you undertake business deals with patients?				
14. Do you take great pride in the fact that such an attractive, wealthy, powerful, or important patient is seeking your help?				
15. Have you accepted for treatment a person with whom you have had social involvement or whom you know to be in your social or family sphere?				
16. When your patient has been seductive with you, do you experience this as a gratifying sign of your own sex appeal?				

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Please give your immediate, “off the cuff” responses:	Never	Rarely (Yearly)	Sometimes (Quarterly)	Often (Monthly)
17. Do you disclose sensational aspects of your patient’s life to others? (even when you are protecting the patient’s identity)				
18. Do you accept a medium of exchange other than money for your services? (e.g. work on your office or home, trading of professional services)				
19. Do you find yourself comparing the gratifying qualities you observe in a patient with the less gratifying qualities in you spouse or significant other? (e.g. thinking: “Where have you been all my life?”)				
20. Do you feel that your patient’s problems would be immeasurably helped if only he/she had a positive romantic involvement with you?				
21. Do you make exceptions in the conduct of treatment because you feel sorry for your patient, or because you believe that he/she is in such distress or so disturbed that you have no other choice?				
22. Do you recommend treatment procedures or referrals that you do not believe to be necessarily in your patient’s best interest, but that may instead be to your direct or indirect financial benefit?				
23. Have you accepted for treatment individuals known to be referred by a current or former patient?				
24. Do you make exceptions for your patient because you are afraid she/he will otherwise become extremely angry or self-destructive?				
25. Do you take pleasure in romantic daydreams about a patient?				
26. Do you fail to deal with the following patient behavior(s): paying the fee late, missing appointments on short notice and refusing to pay for the time (as agreed), seeking to extend the length of sessions?				
27. Do you tell patients personal things about yourself in order to impress them?				
28. Do you find yourself trying to influence your patients to support political causes or positions in which you have a personal interest?				
29. Do you seek social contact with patients outside of clinically scheduled visits?				
30. Do you find it painfully difficult to agree to a patient’s desire to cut down on the frequency of therapy, or to work on termination?				
31. Do you find yourself talking about your own personal problems with a patient and expecting her/him to be sympathetic to you?				
32. Do you join in any activity with a patient that may serve to deceive a third party? (e.g. insurance company)				

Scoring Key: Never = 0, Rarely = 1, Sometimes = 2, Often = 3.

A total of 27 or greater, scores in the highest 10% of a sample of 532 psychiatrists.

* Epstein, R.S. and Simon, R.I. “The Exploitation Index: An Early Warning Indicator of Boundary Violations in Psychotherapy”

* Epstein, R.S. Simon, R.I., and Kay, G.G. “Assessing Boundary Violations in Psychotherapy: Survey Results with The Exploitation Index.” Bulletin of the Menninger Clinic 56:150-166, 1992.

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Educational Manual for Evidence-Based Chiropractic

Chapter 2 Diagnostic Imaging

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DIAGNOSTIC IMAGING

INTRODUCTION

The fundamental purpose of diagnostic imaging is to provide information to assist in the development of a diagnosis or otherwise impact the treatment plan. It is the responsibility of the chiropractic physician to keep abreast of advancements in diagnostic imaging. The chiropractic physician must make imaging decisions based on what is best for the patient.¹ This chapter presents current knowledge regarding the utilization of diagnostic imaging in the assessment of chiropractic patients.

APPROPRIATE UTILIZATION OF RADIOGRAPHIC STUDIES

While diagnostic-imaging procedures may be vital to diagnosis and case management, the decision to utilize any diagnostic imaging procedure should be based on a demonstrated need (i.e. clinical necessity) following an adequate case history and physical examination.²

Once radiographs have been obtained, it is required³ that a report of the findings be recorded and placed in the patient's permanent record. It is the responsibility of the clinician to ensure that all radiographs are evaluated for pathologic and biomechanical information. All radiographic reports will include the patient's name, age, sex, date of examination and report, and area of study and views. A narrative of radiographic findings, and impressions should be included.

The following discussion is designed to assist in the plain film radiographic decision-making process. The guidelines are divided into categories as shown in Table 1. These categories include: clinical indicators, structural and functional abnormalities, other indicators, and inappropriate use of x-rays. All relevant clinical and historical information needs to be considered.⁴⁻³⁹ The practitioner's clinical judgment will be the basis for determining whether to take radiographs or not.⁴⁰

CLINICAL INDICATIONS

Table 1: Guidelines for Chiropractic Utilization of Radiographic Studies

- History of malignancy (with unexplained new symptoms)^{4,5,6,7,11,12, 17, 19, 29}
- Significant trauma, recent trauma, repetitive trauma with significant clinical findings^{4,5,6,7,12,13,14,15,16,17,18, 19}
- Old trauma in the area of complaint³
- Suspected fractures^{5,10,18}
- Clinically significant neurologic signs and symptoms^{4,5,6,7,13,14,15,16,19,29}
- Unexplained weight loss^{4,5,6,7,14,17,19, 29}
- Unrelenting night pain^{6, 17, 35}
- Pain unrelieved by recumbency^{6,7,29, 38}
- Suspicion or history of inflammatory arthritis with change in symptoms^{4,5,11,13,14,31}
- Known or suspected bone density loss^{6,7,12}
- Palpable mass⁵

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- Substance abuse^{4,5,7,14}
- Prolonged corticosteroid use^{4,5,7,14,17}
- Fever of unknown origin (>100° F)^{4,5,7,14,17}
- Suspected infection^{5,6,7,11,29}
- Abnormal laboratory finding (Erythrocyte Sedimentation Rate [ESR], White Blood Cell Count [WBC], etc.)^{5,6,7,11,17}
- Recent surgery or invasive procedure related to chief complaint^{5, 17}
- Failure to improve without prior radiography^{4,5,6,14,17}
- Patients over 50 years of age are at greater risk of having significant pathologies^{4,5,7,12,14,17,19,29,32}

Identification of Structural or Functional Abnormalities

- Scoliosis or deformity^{5,17,20,21,30}
- Congenital anomaly^{5,13,27}
- Surgical history at area of chief complaint^{5,6,17,22}
- Postural abnormalities^{17,}
- Hyper/hypomobility^{23,24,36}
- Aberrant motion³²

Other Indicators

- Suspected physical abuse²⁸
- Environmental exposure to toxic or infectious agents¹⁷
- Recent immigration or foreign travel¹⁷
- Medicolegal implications when combined with clinical indicators^{4,17,25}

Inappropriate use of x-rays

- Pregnancy - unless the patient's symptoms are of such significance that failure to x-ray would result in a substantial health risk to the mother^{8,9}
- Financial gain^{4, 17, 33}
- Patient education^{4, 17}
- Routine (habitual) screening procedure^{4, 17, 26, 33}
- Research without sanctioned review-board approval³⁴
- Unnecessary duplication of services
- Routine pre-employment screening¹⁷
- Inadequate equipment to produce a diagnostic radiograph^{3,5,10,17}
- Routine discharge radiographs^{17,33}
- Non-licensed operator^{3, 17}

IMAGING MODALITIES

There are a number of imaging modalities available to the chiropractic physician to utilize in the diagnostic work-up and treatment of patients. The following will be a discussion of those modalities including plain film radiography, tomography, fluoroscopy, videofluoroscopy, computed tomography (CT), magnetic resonance (MR) imaging, radionuclide imaging (bone scan), myelography, DEXA, PET, and ultrasound.

Unless specifically indicated, this Educational Manual constitutes practice recommendations and not administrative rules.

Plain Film Radiography

The use of plain film radiography in the chiropractic profession began in 1910.³⁶ It was initially used as a research tool and later as the imaging modality of choice for diagnosis of pathology as well as evaluation of postural and biomechanical integrities of the spinal column and pelvis. Use has expanded to include the appendicular skeleton.

Plain films offer the doctor insight into pathology, indications and contraindications for chiropractic adjustment, as well as postural and biomechanical alterations.⁵ The risk of exposure to ionizing radiation mandates that a thorough history and examination be performed prior to the decision to utilize these procedures.

AP and lateral radiographs of the skeleton are the most common imaging procedure used in the chiropractic office. Additional views to the minimum diagnostic series include oblique views, angulated spot views, and dynamic stress studies. Oblique projections are essential in evaluating the facet joints of the cervical and lumbar spine as well as the intervertebral foramina (IVF) in the cervical spine. In the appendicular skeleton, oblique projections more fully demonstrate complex anatomy. Angulated projections are helpful in confirming or denying the presence of osseous versus soft tissue lesions. The sacroiliac joints are more clearly demonstrated on the angulated projection than on any other study.³⁷ Dynamic stress views include flexion/extension and lateral bending of the cervical and lumbar spine. These studies reveal information related to the end range of motion.³⁸ Stress radiography is also utilized to evaluate injured joints of the appendicular skeleton.

Soft Tissue Radiography

Soft tissue radiographs, chest and abdomen, are also utilized by the chiropractic physician. These types of studies may require specialized equipment i.e. film, screens, and grids to produce high quality radiographs. As with all radiographic procedures it is essential to obtain the highest quality radiographs when performing these procedures. Radiographs of soft tissues are strictly taken to evaluate for pathology. Poor quality radiographs reduce the likelihood that abnormalities will be identified.

In addition to plain film radiography of the abdomen, contrast studies of the digestive tract, barium swallow and enema, may be utilized by the chiropractic physician. Specialized equipment, i.e. fluoroscope, is needed to insure proper exposure and to produce superior quality radiographs. The images of the procedure must be videotaped. Initial evaluation of these procedures should be done in real time. Special training and experience are required to perform and interpret contrast studies.

Minimal Diagnostic Radiographic Series

It is accepted within the healthcare community that a minimum series of diagnostic radiographs are needed to evaluate each region of interest. As a general rule two views 90° to each other should be obtained. Some areas require additional views as an essential part of the minimal diagnostic series. The following tables represent the accepted standards.

Table 2: Minimum Standard Views for the Axial Skeleton, Chest, and Abdomen

AREA	AP	LATERAL	OBLIQUE	APOM	PA	ANGULATED
CERVICAL ³⁹	X	X		X		
THORACIC ⁴⁰	X	X				
*LUMBAR ⁴¹	X	X				
PELVIS	X					
SACRUM/COCCYX	X	X				
STERNUM		X	X			
CLAVICLE	X					X
RIBS	X		X			
†SKULL	PA Caldwell	X				
CHEST (Full Inspiration) ⁴²		LEFT			UPRIGHT	
ABDOMEN	X					

*Lumbar spots may be needed, dependent upon the ability to visualize the L5-S1 region. Lateral spot or AP angulated spot radiographs should be considered after evaluation of the AP and lateral.

†To rule out pathology plain radiographs of the skull should only be taken as part of a study that includes computed tomography or MRI.⁴³

Table 3: Minimum Standard Views for the Extremities**

AREA	VIEWS
ACROMIOCLAVICULAR JOINT ⁴⁴	Bilateral AP
SHOULDER	Internal and external rotation
ELBOW	AP and Lateral
WRIST	Dorsopalmar, dorsal oblique, and lateral
HAND	Dorsopalmar, dorsal oblique, and lateral
FINGERS	Dorsopalmar, dorsal oblique, and lateral
HIP	AP and frog leg lateral
KNEE	AP and lateral
PATELLA	AP, lateral, and sunrise
ANKLE	AP, medial oblique, and lateral
CALCANEUS	Axial and lateral
FOOT	AP, medial oblique, and lateral
TOES	AP, medial oblique, and lateral
LONG BONES	AP and lateral
TEMPOROMANDIBULAR JOINT	Lateral (TM joint is better evaluated with advanced imaging – MRI)

**Complete extremity series are dependent upon patient presentation and findings on initial radiographs.

NEUROMUSCULOSKELETAL SPECIAL IMAGING PROCEDURES

The choice of an appropriate imaging modality is a case specific process. A given patient may have specific needs or limitations that affect choices. The exact nature and degree of the pathology suspected affects imaging choices. These factors and the continuing development of imaging protocols make consultation with a radiologist valuable. The information provided here is intended as a general guide.^{15,46-58}

Magnetic Resonance Imaging

Magnetic resonance imaging (MRI) is a valuable diagnostic tool in neuromusculoskeletal imaging. Sectional images can be obtained through all body areas in axial (transverse), sagittal and coronal planes, or at oblique angles for smaller anatomical areas. No ionizing radiation is produced with MRI and risks to appropriately chosen patients have not been identified. Patients with pacemakers, some aneurysm clips, metallic foreign bodies, and other ferromagnetic artifacts are not appropriate candidates for MRI.

In general, MRI images tissues based on their hydrogen atom content, reflecting total quantity and molecular bonds. Therefore, both free and intracellular water, and fat produce the majority of the MRI "signal" which creates the image. MRI is an excellent procedure for imaging soft tissues of the body including the brain, spinal cord and cerebrospinal fluid, intervertebral discs, articular cartilage, muscles, tendons, ligaments, menisci, and most organs. MRI does not image cortical and trabecular bone though changes in the surrounding marrow can be diagnostic for many osseous pathologies.⁵¹

MRI is rarely used as the initial imaging procedure. In many cases, MRI will provide additional information after evaluation of plain film radiographs. MRI may be used as the initial study in cases of significant or rapidly progressing neurologic changes, especially those that indicate central nervous system (CNS) pathology. MRI is also useful as a follow-up imaging procedure after surgical treatment for IVD herniation and neoplasm.⁵¹

Computed Tomography

Computed tomography (CT) combines the imaging physics of plain film x-ray with the advantages of sectional imaging. Like plain film, CT produces its images through the interaction of x-ray photons with the tissues of the body, and is quite valuable in imaging osseous structures.¹⁵ CT also carries the same consideration of the potential harmful effects of ionizing radiation. The radiation dose should be kept as low as possible without losing diagnostic information and the risk-benefit ratio carefully weighed. Pathologies containing calcium densities may also be evaluated with CT. Some soft tissues, particularly of the chest and abdomen are best imaged with CT due to limitations of MRI in those areas.

Previously known as the CAT (computed axial tomography) scan, it is important to remember that primary or direct images are obtained in the axial plane. Sagittal and coronal reconstructions can be formed with the data obtained in the axial plane, but some extrapolation is done by the computer with a resultant loss of detail. Three-dimensional CT offers limited diagnostic information and is used primarily as a surgical planning tool.

Computed tomography is used extensively, with and without intravenous contrast agents, for chest and abdomen examinations. It is superior to MRI in most scenarios for the chest and abdomen since the motion artifacts produced by heart contractions and bowel peristalsis may interfere with the acquisition of MR images. Plain film radiographs, as scout films, will often be used for preliminary examination of the chest and abdomen before CT imaging.

CT provides detailed evaluation of fractures. This is particularly useful in unusually shaped bones or areas difficult to image with plain film such as the pelvis, craniovertebral junction, posterior elements of the spine, and ankle. Computed tomography may be combined with arthrography when the differential list includes cartilaginous and bony abnormalities or when MRI is inconclusive, such as some cases of glenoid labrum tear. CT evaluation in the musculoskeletal system typically follows radiographic examination.

Computed tomography is also used extensively, though less than MRI, in evaluation of the spine, spinal canal, and intervertebral discs. CT is superior to MRI in detailing significant osseous changes, but MRI is usually more valuable in evaluating the impact on neurologic structures. Myelography can improve the ability of CT to evaluate neurologic structures, especially the thecal sac. In some cases, both procedures will be used to reach an accurate diagnosis and provide information for surgical planning. In cases where MRI is not available or not appropriate, CT, with or without myelography, is typically the imaging procedure of choice.⁵¹

CT is also used to evaluate head trauma injuries where fracture and acute intracranial bleed are suspected

Radionuclide Imaging

Radionuclide imaging of bone (bone scan) involves the intravenous administration of a radionuclide tagged to a phosphate analog, which is incorporated in the hydroxyapatite crystal of bone. Gamma rays emitted by the radionuclide are then detected quantitatively to produce an image. The image produced reflects blood flow and areas of increased bone production. Bone scan is much more sensitive than plain film for detecting osseous abnormalities but is distinctly nonspecific and would not be used as the only imaging procedure. A bone scan is typically used when the presence or the location of osseous pathology is questioned. Since almost all pathologies of bone lead to some reactive bone growth, bone scan may be applicable in a wide variety of suspected pathologies. It is most commonly used in the detection of radiographically occult stress fractures, neoplasms, and infection. It is used extensively in the evaluation of skeletal metastasis since the entire skeleton can be imaged at once.^{15,51}

Single photon emission computerized tomography (SPECT) is a very useful method for displaying multiple planes of radionuclide activity. SPECT is especially useful to identify small areas of osseous pathology, particularly in the spine.

Radionuclide scans are also available for many organs. These scans may allow some degree of visualization to evaluate the size and location of organs. They are most useful in their ability to indicate the functional quality of the tissue in question.

Diagnostic Ultrasound

Diagnostic ultrasound (US) is an imaging procedure that relies on the reflection or transmission of sound waves by body tissues for producing images. The added capabilities of Doppler ultrasound allows for the quantification of flow rates in given structures, like arteries. Among the most significant advantages of US are availability, low cost, noninvasiveness, and lack of known harmful effects. This procedure is used frequently in abdominal imaging where it is capable of determining organ size, organ masses, and in distinguishing between cystic, solid, and complex masses. It is typically the first imaging procedure chosen for thyroid abnormalities and can provide useful information in breast imaging. Diagnostic ultrasound is also increasing in use for musculoskeletal imaging and it is capable of detecting tears or hypertrophy in some of the commonly injured and more superficial soft tissue structures. Superficial masses may also be initially evaluated by ultrasound.

The large quantity of cartilage relative to bone in the pediatric skeleton, especially the very young, lends itself to evaluation by ultrasound. Diagnostic ultrasound of the adult spine is controversial due to a lack of consensus on normal versus abnormal findings.⁵¹

Videofluoroscopy

Videofluoroscopy (VF) is a modality that enables clinicians to view dynamic, real-time imaging of anatomy and function. VF is also a diagnostic test that can reliably record dynamic function of joints and their range of motion.^{[1], [2], [3], [4], [5]} The role of VF has been well established in interventional radiology and in the evaluation of neuromusculoskeletal, gastrointestinal, myelographic, and other studies requiring the injection of contrast material.

VF like other advanced imaging modalities is not typically utilized as an initial imaging procedure. It may be used as a follow-up to demonstrate abnormal joint mobility that is suspected clinically but not adequately substantiated by other diagnostic studies.^{[6], [7], [8]} The value of VF, by comparison to static imaging modalities, is its ability to visualize the entire range and character of joint motion.^{[3], [4], [6], [9], [10], [11]} The ability of VF to absolutely define segmental range of motion and the therapeutic significance of direct visualization of spinal dynamic function needs further investigation.^[5]

Practitioners utilizing VF must document clinical justification and be cognizant of its contraindications, and limitations.^{[12], [13], [14], [15], [16]} Specialized training is needed to adequately interpret the images acquired. Operators of this equipment must be knowledgeable in the basic concepts of radiobiology and fluoroscopy systems.^[4]

PATHOLOGY	PLAIN FILM	COMPUTED TOMOGRAPHY	MRI	RADIONUCLIDE STUDY	ULTRASOUND	CLINICAL CONSIDERATIONS
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Table 4: Comparison of Imaging Procedures

PATHOLOGY	PLAIN FILM	COMPUTED TOMOGRAPHY	MRI	RADIONUCLIDE STUDY	ULTRASOUND	CLINICAL CONSIDERATIONS
Muscle or tendon injury of extremities	Minimal use: May identify secondary effects, such as subluxation, gross disruption of Achilles' and quadriceps tendons.	No routine use; may add info regarding associated osseous structures	Ideal imaging in most cases	No routine use	Best imaging choice in some cases, particularly where structure is superficial (rotator cuff, Achilles' tendon, quadriceps tendon, many muscles)	Imaging often not required; most useful in evaluating for suspected instability and the need for surgery
Ligamentous injury of extremities	May identify secondary effects such as subluxation stress studies may be diagnostic	No routine use; may add info regarding associated osseous structures	Ideal imaging in most cases	No routine use	Limited, specific applications	Imaging often not required; most useful in evaluating for instability and need for surgery
Fibrocartilage injury	Offers little or no diagnostic information	Offers little or no diagnostic information	Imaging of choice in most cases	No routine use	No routine use	Arthroscopy may be the most appropriate procedure
Muscle, tendon or ligament injury of spine ¹⁵	May identify secondary effects such as subluxation, especially on stress studies.	No routine use; May add info regarding associated osseous structures	No routine use; gross soft tissue disruptions may be appreciated	No routine use	Limited specific applications	

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PATHOLOGY	PLAIN FILM	COMPUTED TOMOGRAPHY	MRI	RADIONUCLIDE STUDY	ULTRASOUND	CLINICAL CONSIDERATIONS
IVD pathology (excluding routine degenerative change) ^{15,46-48}	Limited information; may be used to rule out other diagnoses	Provides some imaging of disc , herniations; addition of myelography provides some information of effect on adjacent neural structures	Best imaging choice, provides anatomical and physiological information and the effect on adjacent neural structures without added contrast	No routine use	No routine use	Incidental bulges and herniations may have no clinical significance. Discogram may be useful to identify symptomatic annular tears.
Stenosis: central canal, lateral recess, intervertebral foramen ^{59,50}	Limited value in evaluating presence or extent of stenosis; often first imaging choice to evaluate gross osseous changes	Excellent for determining and quantifying osseous and some soft tissue causes of stenosis; addition of myelography allows evaluation of effect on neural structures	Often imaging of choice due to less invasive nature, lower risks. Excellent for determining soft tissue causes of stenosis and for determining effect on neural structures; less useful in evaluating osseous impact	No routine use	No routine use	
Post-surgical spine, new or increased symptoms ¹⁵	Appropriate for initial evaluation; stress views may be useful in evaluating fusion	May be useful in evaluating osseous abnormalities; surgical changes may make interpretation difficult	Appropriate for evaluating effect on neurologic structures; with contrast can identify scar tissue	May be useful in detecting pseudoarthrosis	No routine use	

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PATHOLOGY	PLAIN FILM	COMPUTED TOMOGRAPHY	MRI	RADIONUCLIDE STUDY	ULTRASOUND	CLINICAL CONSIDERATIONS
Fracture, acute, extremity (1)	Initial imaging of choice; often only imaging required	Useful for complex fractures, areas of complex anatomy (elbow, ankle, etc.); appropriate for evaluation of intra-articular extent of fracture	Excellent for identifying bone contusions and subtle fractures may be used following CT to determine effect on neurologic structures	Useful when clinical suspicion of fracture is high and radiographs are negative or inconclusive	No routine use	
Fracture, acute, spine ^{7,51}	Initial imaging of choice; may require follow-up with CT or MRI	Excellent for evaluating spinal fracture; appropriate when suspicion of spinal fracture is high and radiographs are negative or inconclusive; sagittal and coronal reconstructions may be helpful; useful in areas of complex anatomy (craniocervical and pelvis, etc.)	Appropriate for spinal injury with positive neurologic findings; Excellent for evaluating effect on neural structures; offers little fracture detail; can differentiate simple compression fracture from pathologic fracture	May be used when clinical suspicion of fracture is high and radiographs are negative; SPECT imaging may be required	No routine use	

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PATHOLOGY	PLAIN FILM	COMPUTED TOMOGRAPHY	MRI	RADIONUCLIDE STUDY	ULTRASOUND	CLINICAL CONSIDERATIONS
Fracture, stress ⁴⁹	Initial imaging of choice; many will be radiographically occult, especially in early stages	May be used to determine extent; not usually required; may be useful for pars interarticularis	Sensitive to early changes; may be difficult to differentiate stress fracture from other pathologies	Appropriate for detection of radiographically occult, clinically suspected stress fracture; may require SPECT imaging, especially in the spine and other areas of complex osseous anatomy	No routine use	
Dislocation	Most appropriate initial imaging	Useful if radiographic findings questionable; may be used for additional detail, especially to detect associated fracture	May be useful in detailing associated soft tissue injuries and/or effect on adjacent neurovascular structures	No routine use	No routine use	
Articular cartilage pathology ⁵²	Depicts general cartilage loss; may show calcinosis secondary to crystal deposition; not effective for focal defects	No routine use	Diagnostic in most cases; intra-articular contrast (MRI-arthrogram) may improve sensitivity	No routine use	No routine use	

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PATHOLOGY	PLAIN FILM	COMPUTED TOMOGRAPHY	MRI	RADIONUCLIDE STUDY	ULTRASOUND	CLINICAL CONSIDERATIONS
Suspected intra-articular body	Most appropriate initial imaging; may not provide information with uncalcified, unossified cartilagenous bodies	With arthrography, can provide diagnostic information	Can provide diagnostic information; excellent for osteochondritis dessicans ¹⁵	No routine use	No routine use	Arthroscopy preferred if clinical suspicion is high
Congenital malformation ¹⁵	Initial imaging of choice	May provide detail in complex osseous malformation	May provide valuable information regarding associated soft tissue or neural abnormalities	No routine use	No routine use	
Biomechanical aberration	Appropriate for initial imaging; stress views may be required; fluoroscopy may add information	May be useful as follow-up to radiographically identified abnormalities	May be useful; stress studies may be useful	No routine use	No routine use	
Degenerative joint disease ^{53,54}	Imaging of choice	Rarely provides additional information; some complex or surgical cases may benefit	May be useful in evaluating some complications, such as stenosis	Can identify sites of involvement, but very non-specific	No routine use	

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PATHOLOGY	PLAIN FILM	COMPUTED TOMOGRAPHY	MRI	RADIONUCLIDE STUDY	ULTRASOUND	CLINICAL CONSIDERATIONS
Inflammatory arthritis ^{55,56}	Imaging of choice	Rarely provides additional information	Can detect some changes earlier than plain film	No routine use	No routine use	
Crystal deposition disease ^{57,58}	Imaging of choice	More sensitive to calcium deposition, but rarely provides additional information	Can detect articular cartilage involvement	No routine use	No routine use	
Infection ^{7,15}	Initial imaging of choice; radiographic latent period from several days to several weeks	May be useful as follow-up to radiographically identified abnormalities	Very sensitive; no significant latent period; useful in radiographically occult cases and to determine extent of involvement	Much more sensitive than plain film; non-specific; useful in cases of high clinical suspicion and negative radiographs	No routine use	
Neoplasm, osseous ⁷	Initial imaging of choice	May be useful as follow-up to radiographically identified abnormalities or in areas of complex anatomy	Very sensitive; may provide useful histologic information; useful in radiographically occult cases and to determine extent of involvement. Procedure of choice for multiple myeloma	Much more sensitive than plain film; non-specific; useful in cases of high clinical suspicion and negative radiographs, and to determine the extent of skeletal metastasis		Metastasis evaluation requires very specific Metastasis evaluation requires very specific protocols based on a number of patient variables

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PATHOLOGY	PLAIN FILM	COMPUTED TOMOGRAPHY	MRI	RADIONUCLIDE STUDY	ULTRASOUND	CLINICAL CONSIDERATIONS
Neoplasm, soft tissue ⁵⁹	Initial imaging of choice, but frequently non-diagnostic; use soft-tissue technique	Useful in evaluating tumors containing fat, calcium or bone; useful in determining osseous involvement	Most appropriate imaging	No routine use	May be useful in determining some tumor characteristics and effect on adjacent structures	P.E.T. useful for detecting breast, colon and brain neoplasms
Avascular necrosis	Initial imaging of choice; significant radiographic latent period	No routine use	Most appropriate in cases of high clinical suspicion and negative radiographs; demonstrates extent of involvement ¹⁵	Sensitive, but not specific; appropriate in cases of high clinical suspicion and negative radiographs	No routine use	
Metabolic disease	Secondary skeletal changes may be identified and monitored	Not likely to add significant information	Some complications, changes may be identified	May provide information regarding sites of skeletal involvement	No routine use	
Head injury	Not likely to provide significant information	Imaging of choice in suspected skull fracture; provides significant information regarding acute brain trauma	Provides significant information regarding brain trauma; CT may be more appropriate in early stages	No routine use	No routine use	

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PATHOLOGY	PLAIN FILM	COMPUTED TOMOGRAPHY	MRI	RADIONUCLIDE STUDY	ULTRASOUND	CLINICAL CONSIDERATIONS
Chronic sinus disease	Appropriate for initial evaluation; not as sensitive or specific as CT	Most appropriate imaging; initial imaging in most cases	May be used as follow-up to CT findings in unusual cases	No routine use	No routine use	
GI disease	Abdomen plain film does not provide adequate information in most scenarios; used as initial evaluation for suspected acute obstruction or perforation; barium studies may be diagnostic	Provides best imaging of many organs; frequently used with addition of barium	Useful for evaluation of some organs; presence of gas and intestinal motility often provides for poor imaging	Scans for specific organs can be useful	Frequently used in evaluation of abdominal disease; especially useful for solid organs and cystic abnormalities	
GU disease	Frequently used as initial study, but usually requires additional imaging; addition of contrast often required	Often provides best imaging; usually includes contrast agent	Frequently useful; may not provide adequate imaging of some areas	No routine use	Frequently used for evaluation of kidney and bladder disease	

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IMAGING OF BIOMECHANICAL ABNORMALITIES

Chiropractic radiographic analysis that includes appropriate views, when combined with clinical findings, is intended to provide a better understanding of the patient's condition⁶⁰. High quality radiographic images are essential to rule out pathology and evaluate structural alignment⁶¹. When radiographs are part of a biomechanical analysis it is paramount to evaluate images for pathologies that may weaken bony architecture, requiring modification of therapy^{62,63}. Biomechanical analysis is used to determine misalignment, postural and motion abnormalities, and to guide manipulation.

Many radiographic lines, angles, and measurements have been demonstrated to be reliable indicators of postural and biomechanical abnormalities.^{32,37}

Spinal Radiographic Analysis

Most chiropractic methods of radiographic analysis have stressed the importance of assessing the patient in the upright, weight-bearing position. This allows for both full spine and regional postural evaluation. Specific consideration is given to the identification of abnormal spinal curves, that may compromise efficient biomechanical function. Studies that evaluate the reliability, validity and clinical relevance of radiographic line drawing have produced conflicting evidence.^{32,37}

Reliability

Reliability is the repeatability of a measurement and indicates consistency and precision when a procedure is done by different examiners and at multiple times.¹⁴ Factors that influence the reliability of spinal radiographic analysis include: anatomic variants, positioning of patient and x-ray equipment. In addition to these and other potential sources of systematic error, random measurement error adversely affects the reliability of measurement methods. While inter-examiner reliability of the actual marking of x-rays has been demonstrated⁶⁴⁻⁶⁸, the reliability of the entire procedure has not been established.¹⁴ Reliability does not establish the clinical relevance or validity of measurement procedures.

Validity and Clinical Efficacy

Validity refers to how accurately an assessment procedure measures, identifies or predicts the true state of the patient.⁶⁹ While construct validity (a measure of the theoretical concept of x-ray line marking) has been evaluated,⁶⁸ the predictive validity (the clinical relevance of x-ray line marking, i.e. can it identify current spine problems, predict future occurrences, or measure resolution) has not been established through well-designed clinical trials.⁷⁰ Predictive validity is crucial; it is far more relevant than construct validity or reliability tests in establishing the clinical efficacy of assessment procedures

Functional Radiographic Analysis

Functional radiographs are practical tools for the evaluation of spinal segmental motion. Since Hviid⁷¹ in 1963, chiropractors including Sandoz,⁷² Anderson,⁷³ Conley,⁷⁴ West,⁷³ Grice⁷⁵ and Henderson⁷⁶ have advocated cervical templating techniques to determine hypomobility, hypermobility and instability of spinal motion segments. Functional radiographs may be used to evaluate the segmental range of motion by comparing the neutral position to the end range of movement in either the sagittal or coronal planes. Medical investigators, including Penning⁷⁷ and Dvorak,³⁸ have established normative values for gross segmental flexion and extension without reference to the neutral lateral view. However, clinical information may be lost when the information from the neutral position is not included in the assessment.

The key to accurately evaluating motion on functional spinal radiographs is precise standards of patient positioning.⁶⁰ Meticulous attention to the details of positioning cannot be overemphasized if the information obtained from the resultant radiographs is to be considered a reliable assessment of that particular patient's function.⁷⁸ Functional radiographic studies have traditionally been performed with active movement by the patient. Dvorak et al³⁸ emphasized the value of obtaining functional radiographic studies of the cervical spine both actively and passively. While they claim that many more hypermobile segments are discovered on the passive stress studies³⁸ the application of force at the end of active range of motion risks injury to the patient. These systems of functional radiographic analysis may be of clinical value to the doctor of chiropractic who provides spinal manipulation/adjustments to specific levels of segmental dysfunction.³² The reliability³⁸ and clinical validation⁷⁹ of cervical flexion extension studies have been demonstrated.

Full Spine Radiography

Depending on history and clinical findings, the need for full spine radiography is based on the clinical judgment of the doctor. The choice of sectional or full spine views is dependent on clinical necessity and the ability to produce diagnostic quality radiographs. AP/PA full spine radiographs are used for evaluation of pathology and biomechanical analysis. Single exposure, lateral full spine radiographs are not recommended.⁶³

The use of full spine radiographs is of value when clinical findings indicate the involvement of multiple spinal levels.⁶³ Taylor³² has noted the following circumstances in which the PA full spine radiograph may be preferred over sectional radiographs:

- cases in which clinical examination disclosed the need for radiography of several spinal sections;
- cases in which severe postural distortions are evident, scoliosis evaluation after clinical assessment;
- cases in which a mechanical problem in one spinal area adversely affects other regions;
- to specifically evaluate complex biomechanical or postural disorders of the spine and pelvis under weight bearing conditions.³²

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Full spine radiographs can be considered to be of diagnostic quality⁸⁰ with less radiation exposure to the patient compared to sectionals of the multiple levels involved. This requires appropriate technology and technique with careful attention to exposure factors, film speed, and shielding.^{78,81,82} The evaluation of suspected pathology may require sectional or spot views to attain better detail.⁶³ Analysis of full spine radiographs has been used to identify biomechanical faults, chiropractic subluxations and joint dysfunction.. There is a variety of line marking systems used to evaluate radiographs. The validity and reliability of the full spine analytical systems has been studied with mixed results.^{63,83,84,85}

PATIENT SAFETY

Patient safety in diagnostic imaging encompasses a range of activities performed before, during and after the actual imaging exam. The primary goal of these efforts is to provide the most clinically significant information with the lowest possible risk and cost to the patient.^{86,87,88} The following key areas should be addressed: patient education and informed consent (PARQ), patient comfort, selection criteria, radiation safety, image quality control, facilities maintenance and record keeping.

Patient Education and Informed Consent (PARQ)

The chiropractic physician should explain the diagnostic imaging procedures and follow up, the time and cost involved, risks and contraindications, and patient preparatory procedures. This should be done regardless of whether the treating physician will perform the imaging or order it from another facility. (See patient/doctor relationship chapter)

Patient Comfort

A clean, safe, comfortable environment should be provided for waiting, changing garments, securing personal items, and performing the imaging procedure. The privacy of the patient should be guarded during preparation for and execution of the exam, as well as with the storage of radiographs and reports.

Radiation Safety

The most important aspect of patient safety is to minimize the radiation dose to the patient. There is no known safe dose of ionizing radiation. Even the smallest dose can produce genetic damage. Diagnostic imaging doses do not typically produce clinical manifestations. The benefit to the patient must outweigh the risk.⁸⁸⁻⁹² As Low As Reasonably Achievable (ALARA): Efforts should be made in all areas of the imaging procedure to provide the lowest possible dose to the patient without compromising image quality.⁹⁰

Patient Selection Criteria

The planned diagnostic imaging procedures must supply significant clinical information that cannot be otherwise determined. If the diagnosis, treatment or prognosis will not likely change based on imaging findings, the imaging is not appropriate. Every exposure, including post-treatment exposures and scanograms, must have clinical justification with adequate documentation consistent with the patient's case history.⁹³

Chiropractic physicians are responsible for ordering necessary and appropriate imaging studies. More than one study may be indicated to fully evaluate a patient. Pre-existing x-ray studies should be accessed if possible. These may be repeated if timely access is not feasible, they are of poor quality or are not clinically relevant. Consultation with a radiologist may be helpful in determining which studies are most appropriate for a case.

Image Quality Control

Assurance of image quality and low patient dose is dependent on many equipment and procedure factors. Attention is required in the setup and maintenance of equipment as well as during the imaging procedures.^{86,87,89,94}

The following factors are listed as a guide for evaluating and monitoring plain film quality as it relates to patient safety. These should be considered to assure the highest possible film quality and lowest possible patient dose.

Equipment

- Tables and film holders: stable, level, and plumb
- Control arm / tube holder: stable, locking mechanism for maintaining appropriate angle, markings for consistent and reproducible source image distance (SID)
- Collimation: accurate, centered, apparent on three sides
- X-ray tube and exposure controls: calibrated, current exposure charts
- Film/screen combinations: as fast as possible while maintaining adequate detail, screens clean and without defects, cassettes marked and without defects
- Markers: adequate to identify patient, anatomy, special procedures, proper placement
- Filters and shields: devices for reducing dose to sensitive tissues such as eye, thyroid gland, breast, and gonads should be available for frequently performed studies
- Processor: chemicals should be changed at prescribed intervals, processing temperature and speed consistently monitored

- Darkroom: film storage and handling should be safe from fogging factors

Technique

- Technique charts: current and appropriate to the equipment; charts used consistently, factors recorded
- Positioning: standard and consistent positioning; options in positioning that may reduce dose employed (PA for full-spine; anode-heel effect).^{95,96} minimum diagnostic series to assure complete evaluation
- Patient prep: gown as appropriate, remove jewelry, dentures, other artifacts as appropriate
- Repeat films rates: monitored to identify problems

Facilities Maintenance

Equipment such as a floating tabletop, movable wall bucky, and the locking tube arm mechanism should be stable. Storage of chemicals should not pose a hazard to patients.

Facilities should allow for adequate performance of chosen procedures. Room size should accommodate the longer source-image distance (SID) required of projections such as the lateral cervical spine and PA and lateral chest. A horizontal surface should be available to accommodate certain extremity studies, lumbar imaging on larger patients, and patients with difficulty remaining immobile.² Referral may be necessary when facilities will not accommodate for special patient needs. Appropriate shielding should be utilized. Extremity and chest radiographs require specific film/screen combinations. Additional materials such as supports, weights and compression bands should be available. The patient should be referred to an appropriate facility if available equipment is not adequate to perform a chosen study.

Test and evaluation procedures are recommended at given intervals.^{93,96} (See Appendix A.)

Record Keeping

Following production and processing of radiographs, films should be checked for proper identification. (See Appendix B.) A written report should be generated that includes identifying information, the study performed, pertinent findings and a clinical impression. Optimally one copy of this should be kept with the films in addition to a copy that should be placed in the patient's file. Films should be stored in an area that provides for patient privacy and has physically appropriate conditions to protect film quality.⁸⁶

References

1. Haldeman S, Chapman-Smith, Peterson D. Guidelines for Chiropractic Quality Assurance and Practice Parameters: Proceedings of the Mercy Center Consensus Conference. Gaithersburg MD: Aspen; 1993: 13.
2. Oregon Chiropractic Practices and Utilization Guidelines Vol. 1 Common neuromusculoskeletal conditions. OBCE 1991.
3. Oregon Administrative Rules Chapter 811-030-0030-2-C-k.
4. Taylor JAM, Resnick D: Imaging decisions in the management of low back pain. In: Advances in Chiropractic. Mosby; 1994;1: 1-28.
5. Mootz RD, Hoffman LE, Hansen DT. Optimizing clinical use of radiography and minimizing radiation exposure in chiropractic practice. Topics in Clinical Chiropractic 1997; 4(1): 34-44.
6. Simmons ED, Guyer RD, Graham-Smith A, Herzog R. Contemporary concepts in spine care radiographic assessment for patients with low back pain. Spine 1995; 20(16): 1839-1841.
7. Staiger TO, Paauw DS, Deyo RA, Jarvik JG. Imaging studies for acute low back pain when and when not to order. Postgraduate Medicine 1999; 105(4): 161-172.
8. Curry TS, Dowdey JE, Murry RC. Christensen's Physics of Diagnostic Imaging. 4th ed. Lea & Febiger; 1990.
9. Guebert GM, Pirtle OL, Yochum TR. Essentials of Diagnostic Imaging. Mosby; 1995.
10. Oregon Administrative Rules. 1995; OAR 333-106-010 through 130.
11. Roland M, van Tulder M. Should radiologists change the way they report plain radiography of the spine? The Lancet July 18, 1998; 352: 229-230.
12. Scavone, JG, Latshaw RF, Rohrer GV. Use of Lumbar Spine Films. JAMA 1981; 246(10): 1105-8.
13. Miller JS, Craw MM. Diagnostic imaging of the cervical spine following whiplash-induced injury. Topics in Clinical Chiropractic. 1997; 4(1): 26-33.
14. Haas M, Taylor AM, Gillette RG. The routine use of radiographic displacement analysis: A dissent. JMPT. May 1999; 22(4): 258.
15. McLean ID. Choices in diagnostic imaging: A quick reference. Topics in Diagnostic Radiology and Advanced Imaging. Fall 1999; 8-9.
16. Kewalramani LS, Orth MS, Krauss JF. Cervical spine injuries resulting from collision sports. Paraplegia. 1981; 19: 303-312.
17. Rowe L. Imaging of mechanical and degenerative syndromes of the lumbar spine. Clinical Anatomy Management of Low Back Pain; P.276.

18. Mann, DC. Spine fractures in children and adolescents. *Spine*. 1990; 4(1): 25.
19. Deyo RA, Diehl AK. Lumbar spine films in primary care: current use and effects of selective ordering criteria. *Journal General Internal Medicine*. 1:20-25, 1986.
20. El-Sayyad MM. Comparison of roentgenography and Moire topography for qualifying spinal curvature. *Physical Therapy*. 1985; 66(7): 1078-1082.
21. Aaron A, Weinstein D, Thickman D, Eilert R. Comparison of orthoroentgenography and computed tomography in the measurement of limb-length discrepancy. *The Journal of Bone and Joint Surgery*, 1986; 74A(6): 897-901.
22. Kirkaldy-Willis WH, Farfan HF. Instability of the lumbar spine. *Clinical Orthopaedics and Related Research*. 1981; 165: 110-123.
23. Fisk JD. Imaging of the VSC. *The Chiropractic Journal*. 1995.
24. Wood J, Wagner NO. A review of methods for radiographic analysis of cervical sagittal motion. *Chiropractic Technique*. 1992; 4(3): 83-86.
25. Schultz GD, Bassano JM. Is radiography appropriate for detecting subluxations? *Top Clinical Chiropractic*. 1997; 4(1): 1-8.
26. Shaw A, Vigano-Omini M, Houlgrave R, Garent T. Critical analysis of four articles on the clinical usefulness of flexion-extension radiographs of the cervical spine. WSCC Roentgenometrics Class. 1999.
27. Pueschel SM, Scola FH. Atlanoaxial instability in individuals with down syndrome: Epidemiologic, radiographic and clinical studies. *Pediatrics*. 1987; 80(4): 555-559.
28. Cullen JC. Spinal lesions in battered babies. *Journal of Bone and Joint Surgery*. 1975; 57-B(3): 454-456.
29. Perillo M, Hannan M, Lemberg D. Advanced diagnostic imaging of adults with neck or low back pain: A seed algorithm. *Top Clinical Chiropractic*. 1997; 4(1): 9-14.
30. Calliet, R. Scoliosis diagnosis and management. FA Davis. 1975; p. 53-4. Back Letter. 15((9): 97, 100, 2000.
31. Sandman TD, Sandman KB. Rheumatoid arthritis of the cervical spine: Examination prior to chiropractic manipulative therapy. *Journal of Manipulative and Physiological Therapeutics*. March 1981; 4(1): 19-20.
32. Taylor, JAM. The role of radiography in evaluating subluxation. In: Gatterman, MI, *Foundations for Chiropractic: Subluxation*. St. Louis: Mosby; 1995. p. 68-86.
33. Sherman, R. Chiropractic x-ray rationale. *Journal of the CCA*. 1986, 30(1): 33-35.
34. Thomas M. Chiropractic research and the IRB. *J Chirop* 1987; 6:60-63.

35. Woll PJ, Rankin EM. Persistent back pain due to malignant lymphadenopathy. *Ann Rheum Dis* 1987; 46:681-683.
36. Peterson C, Gatterman MI, Wei T. Chiropractic radiography. In. Gatterman MI, Chiropractic Management of Spine Related Disorders. Baltimore: Williams & Wilkins; 1990. p. 90-110.
37. Yochum TR, Rowe LJ. *Essentials of Skeletal Radiology*. 2nd ed. Baltimore: Williams & Wilkins; 1996.
38. Dvorak J, Froehlich D, Penning L, Baumgartner H, Panjabi MM. Functional radiographic diagnosis of the cervical spine: flexion/extension. *Spine* 1988; 13:748-755.
39. American College of Radiology Standards, Diagnostic Radiology. ACR standard for the performance of radiography of the cervical spine in children and adults. 1999.
40. American College of Radiology Standards, Diagnostic Radiology. ACR standard for the performance of radiography of the thoracic spine. 2000.
41. American College of Radiology Standards, Diagnostic Radiology. ACR standard for the performance of radiography of the lumbosacral spine. 2000.
42. American College of Radiology Standards, Diagnostic Radiology. ACR standard for the performance of pediatric and adult chest radiography. 1997.
43. Resnick D. *Diagnosis of bone and joint disorders*. 3rd ed. Philadelphia: W.B. Saunders Company; 1995. p. 2562-63.
44. Bossart PJ, Joyce SM, Manste BJ, Packer SM. Lack of efficacy of 'weighted' radiographs in diagnosing acute acromioclavicular separation. *Annals of Emergency Medicine* 17(1):20-24, 1988
45. Yap JLL, Curl LA, Kvitne RS, McFarland EG. The value of weighted views of the acromioclavicular joint. Results of a survey. *American Journal of Sports Medicine* 27(6):806-809, 1999.
46. Albeck MJ, Hilden J, Kjaer L, Holtas S, Praestholm J, Henriksen O, Gjerris F. A controlled comparison of myelography, computed tomography, and magnetic resonance imaging in clinically suspected lumbar disc herniation. *Spine* 1995;20(4):443-48.
47. Herzog RJ. The radiologic assessment for a lumbar disc herniation. *Spine* 1996;21(24S):19S-38S.
48. Van de Kelft E, van Vyve M. Diagnostic imaging algorithm for cervical soft disc herniation. *Acta chir belg* 1995; 95:152-156.
49. Kaiser JA, Holland BA. Using imaging studies in the diagnosis of low back pain. *Journal of Musculoskeletal Medicine* 1995; July:20-35.
50. Postacchini F. Surgical management of lumbar spinal stenosis. *Spine* 1999; 24(10):1043-51.

51. Taylor JAM, Resnick D. Imaging decisions in the management of low back pain. Mosby-Year Book, Inc.; *Advances in Chiropractic* 1994; Vol. 1:1-28.
52. Bohndorf K. Imaging of acute injuries of the articular surfaces (chondral, osteochondral and subchondral fractures). *Skeletal Radiology* 1999; 28:545-560.
53. Fumiere E, Sintzoff S, Baleriaux D, Matos C. Facet joints disease. 1997; 80:192-195.
54. Preidler KW, Brossmann J, Resnick D. Osteoarthritis. *Seminars in Roentgenology* 1996; 31(3):208-219.
55. Keat A. Spondyloarthropathies. *British Medical Journal* 1995; 310 (May):1321-1324.
56. Rubin DA. The radiology of early arthritis. *Seminars in Roentgenology* 1996; 31(3):185-197.
57. Calcium pyrophosphate dihydrate crystal deposition disease: imaging perspectives. *Current Problems in Diagnostic Radiology* 2000; November/December:210-229.
58. Rui DS, Martel W. Radiologic manifestations of the crystal-related arthropathies. *Seminars in Roentgenology* 1996; 31(3):229-238.
59. Randall RL, Mann JA, Johnston JO. Orthopedic soft-tissue tumors: Concepts for the primary care physician. *Primary Care* 1996; 23(2):241-261.
60. Howe JW: Facts and fallacies, myths and misconceptions in spinography. *J Clin Chiro Archives*, ed. 2. Winter, 34-35, 1972.
61. Peterson CK. The Nonmanipulable Subluxation. In: Gatterman MI, ed. *Foundations of Chiropractic Subluxation*. St. Louis: Mosby; 1995.
62. Gatterman MI, Standards of practice relative to complications of and contraindications to spinal manipulative therapy. *J Can Chir Assoc* 1991; 35:232-6.
63. Taylor JAM. Full-spine radiography: a review. *J Manipulative Physiol Ther* 1993; 16:460-74.
64. Plaughter G, Cremata EE, Phillips RB. A Retrospective Consecutive Case Analysis of Pretreatment and Comparative Static Radiological Parameters following Chiropractic Adjustments. *JMPT* 1990; 13:498-506.
65. Owen EF. Line Drawing Analyses of Static Cervical X-ray used in Chiropractic. *JMPT* 1992; 15:442-9.
66. Plaughter G, Hendricks AH, Doble RW, et al. The Reliability of Patient Positioning for Evaluating Static Radiologic Parameters of the Human Pelvis. *JMPT* 1993; 16:517-22.
67. Harrison DE, Harrison DD, Cailliet R, et al. Cobb Method or Harrison Posterior Tangent Method: Which is Better for Lateral Cervical Analysis? *Spine* 2000; 25:2072-8.
68. Harrison DE, Holland B, Harrison DD, et al. Further Reliability Analysis of the Harrison Radiographic Line-Drawing Methods: Crossed ICCs for Lateral Posterior Tangents and

Modified Risser-Ferguson Method on AP Views. JMPT 2002; 25:93-8.

69. Hulley SB, Cummings SR, Browner WS, et al. Designing Clinical Research: An Epidemiologic Approach. 2nd ed. 2001 Philadelphia: Lippincott Williams & Wilkins. p. 43.
70. Gore DR. Roentgenographic Findings in the Cervical Spine in Asymptomatic Persons: A Ten-Year Follow-up. Spine 2001; 26:2463-6 and Spine 2002; 27:1249-50.
71. Hviid H. Functional radiography of the cervical spine. Ann Swiss Chiro Assoc 3:37-65, 1963
72. Sandoz R. Newer trends in the pathogenesis of spinal disorders. Ann Swiss Chiro Assoc. 5:112, 1971.
73. Swartz JB. Cervical templating. Digest of Chiro Economics March/April 1984.
74. Conley RW. Stress evaluation of cervical mechanics. J Clin Chiro 3:46-62, 1974
75. Grice AS. Preliminary evaluation of fifty sagittal motion radiographic examinations J CCA 21(1):33, 1977.
76. Henderson DJ Dorman TM. Functional roentgenometric evaluation of the cervical spine in the sagittal plane. J Manipulative Physiol Ther 8:219-27 1985.
77. Penning L. Normative movements of the cervical spine. AJR 130:317-26 1978.
78. Peterson C. Chiropractic Radiography. In. Gatterman MI: Chiropractic Management of Spine Related Disorders, Williams & Wilkins, Baltimore 1990.
79. Dvorak J, Panjabi MM, Grob D, Novotny JE, Antinnes JA. Clinical validation of functional flexion/extension radiographs of the cervical spine. Spine 1993; 18:120-7.
80. Phillips RB. An evaluation of chiropractic x-rays by the diplomate members of the American Chiropractic Board of Roentgenology. ACA J Chiro 1980: 14:S80-S88
81. Hardman LA, Henderson DJ. Comparative dosimetric evaluation of current techniques in chiropractic full-spine and sectional radiography. Manipulative Physiol Ther 1981; 25:141-145
82. Hildebrandt RW. Chiropractic spinography. 2nd ed. Baltimore; Williams & Wilkins, 1985.
83. Plaughner G, Hendricks AH. The inter- and intraexaminer reliability of the Gonstead pelvic marking system. J Manipulative Physiol Ther 1991; 14:503-508.
84. Plaughner G, Hendricks AH, Doble RW, Araghi HJ, Bachman TR, Hoffart VM. The effects of patient positioning on radiographically evaluated static configurations of the pelvis. Proceedings of the 1991 Conference on Spinal Manipulation, VA 1991.
85. Harrison DD, Harrison DE, Troyanovich SJ, Hansen DJ. The anterior-posterior full-spine view : the worst radiographic view for determination of mechanics of the spine.

86. Guebert GM, Pirtle OC, Yochum TR: Essentials of Diagnostic Imaging, Mosby, St. Louis 1995.
87. Cullinan AM, Cullinan JE: Producing Quality Radiographs, J.B. Lippincott Company, Philadelphia 1994.
88. Williams JR, Catling MK: An investigation of x-ray equipment factors influencing patient dose in radiography. The British Journal of Radiology 71(1998), 1192-1198.
89. Quality Assurance for Diagnostic Imaging, NCRP Report #99; National Council on Radiation Protection and Measurements, Bethesda, MD; 1990.
90. Johnston DA, Brennan PC: Reference dose levels for patients undergoing common diagnostic x-ray examinations in Irish hospitals. British Journal of Radiology 73(2000): 396-402.
91. Rommens C, Rinegeard C, Hubert P: Exposure of red bone marrow to ionising radiation from natural and medical sources in France. J Radiol. Prot 21 (2001) 209-219.
92. Clarke RH: Conflicting scientific views on the health risks of low-level ionising radiation. J Radiol Prot 18 (September 1998) 159-160.
93. Oregon Administrative Rule 811-030-0030(2)(d) X-ray Departments, Equipment and Procedures.
94. Guidelines for Establishing Radiographic Quality Assurance and Quality Control Programs, State of California, Department of Health Services, Radiologic Health Branch; Sacramento, CA; 1st revision 1994.
95. Fung KKL, Gilboy WB: "Anode heel effect" on patient dose in lumbar spine radiography. British Journal of Radiology 73(2000): 531-536.
96. Nicholson RA, Thornton A, Sukumar VP: Awareness by radiology staff of the difference in radiation risk from two opposing lateral lumbar spine examinations. (correspondence), The British Journal of Radiology, 72(1999),221.
97. Continuous Quality Assurance and Quality Control Program Radiology Department, Western States Chiropractic College, Portland, OR,(in development)
98. Oregon Administrative Rule 811-030-0030(2)(f) X-ray Departments, Equipment and Procedures

Videofluoroscopy Bibliography

1. Reistman CA, et al., Changes in segmental intervertebral motion adjacent to cervical arthrodesis: A prospective study. *Spine*, 2004. 29(11): p. E221-E226.
2. Lee S, et al., Development and validation of a new technique for assessing lumbar spine motion. *Spine*, 2002. 27(8): p. E215-E220.
3. Takayanagia K, et al., Using cineradiography for continuous dynamic-motion analysis of the lumbar spine. *Spine*, 2001. 26(17): p. 1858-65.
4. Humphreys K, Breen A, and S. D, Incremental lumbar spine motion in the coronal plane: An observer variation study using digital videofluoroscopy. *Euro J Chiropractic*, 1990. 238: p. 56-62.
5. Croft AC, et al., Videofluoroscopy in cervical spine trauma: an interpreter reliability study. *J Manipulative Physiol Ther*, 1994. 17(1): p. 20-24.
6. Hino, H., et al., Dynamic motion analysis of normal and unstable cervical spines using cineradiography. An in vivo study. *Spine*, 1999. 24(2): p. 163-8.
7. Jones MD, Cineradiographic studies of abnormalities of the higher cervical spine. *Arch Surg*, 1967(94): p. 206-13.
8. Woesner ME and M. MG, The evaluation of cervical spine motion below C2: A comparison of cineroentgenographic methods. *Amer J Roentg, Rad Ther, and Nuclear Med*, 1972. 115(1): p. 148-154.
9. Yoshimoto H, et al., Kinematic evaluation of atlantoaxial joint instability: An in vivo cineradiographic investigation. *Spine*, 2001. 14(1): p. 21-31.
10. van Mameren, H., et al., Cervical spine motion in the sagittal plane. II. Position of segmental averaged instantaneous centers of rotation--a cineradiographic study. *Spine*, 1992. 17(5): p. 467-74.
11. Dvorak J, et al., In vivo flexion/extension of the normal cervical spine. *J Orthopaedic Research*, 1991. 9(6): p. 828-34.
12. Bell GD, Skeletal applications of videofluoroscopy. *J Manipulative Physiol Ther*, 1990. 13(7): p. 396-405.
13. OBCE, OAR Clinical Justification, in 811-015-0010. 2005.
14. OBCE, OAR Scope of Radiography in the Chiropractic Practice, in 811-030-0020. 2005.
15. OBCE, OAR X-ray Departments, Equipment and Procedures, in 811-030-0030. 2005.
16. Protocol for the use of Spinal Videofluoroscopy, American Chiropractic Association, American Chiropractic College of Radiology and Council on Diagnostic Imaging, 2003

APPENDIX A

Imaging Test/Evaluation Procedures⁹⁷

The following test/evaluation procedures are recommended at the given intervals:

Daily (before use)

- Warm up processor (prescribed time)
- Check developer temperature
- Fill rinse tank
- Clean cross-over rollers
- Run and check "clean-up" film
- Warm up x-ray tube
- Visually inspect darkroom

Daily (end of use)

- Turn off processor
- Offset processor cover
- Drain rinse tank

Monthly

- Inspect film and chemical storage areas
- Inspect darkroom
- Check accuracy of built-in processor thermometer

Quarterly

- Evaluate retake rate, reasons
- Clean intensifying screens
- Inspect screens and cassettes

Semi-annually

- Test darkroom for light leaks
- Evaluate film fog from safelight
- Check film fixer retention
- Check collimator light field to radiation field
- Evaluate intensifying screen/film contact

Unless specifically indicated, this Educational Manual constitutes practice recommendations and not administrative rules.

- Sensitometry-densitometry

Annually (Most performed by service engineer)

- Check/calibrate kVp accuracy
- Check mAs reproducibility
- Check radiation dose reproducibility
- Evaluate filtration
- Check SID accuracy
- Check x-ray beam perpendicularity, bucky centering
- Evaluate focal spot size
- Check grid uniformity and alignment
- Check phototimer reproducibility
- Check exposure timer accuracy

Modified from: Guidelines for Establishing Radiographic Quality Assurance and Quality Control Programs," State of California; Continuous Quality Assurance and Quality Control Program.

APPENDIX B

Legal Requirements for taking X-rays in the State of Oregon⁹⁸

The following changes were made to Chapter 811 administrative rules in November 2004 by the Oregon Board of Chiropractic Examiners. (New language is underlined, deleted language is struck through.)

Supervision

811-030-0011 Staff employees of a Doctor of Chiropractic may be directed to take X-rays of a patient if they are in possession of a permit issued by the State Board of Radiologic Technology, but this permit is limited only to the taking of X-rays. (ORS 684.155)

Scope of Radiography in the Chiropractic Practice

811-030-0020 (1) The radiographic diagnostic aspect of Chiropractic practice shall include all standard radiographic procedures that do not conflict with ORS 684.025.

(2) All radiographs shall be of diagnostic quality. Radiographic films are subject to review by the Board to determine quality. Poor quality radiographs may result in disciplinary action.

(3) X-ray is not to be used for therapeutic purposes.

(4) Fluoroscopy shall not be used as a substitute for an initial radiographic study and shall be used only with documented clinical justification. In order for anyone to operate a fluoroscopy unit they must be properly trained and they must have written documentation that shows that these requirements are met. (OAR 333-106-045)

(5) Use of radio-opaque substances for diagnostic X-ray, other than by mouth or rectum, is not permitted.

(6) Pregnant females shall not be radiographed unless the patient's symptoms are of such significance that the proper treatment of the patient might be jeopardized without the use of such radiographs.

(7) All critical parts, i.e. fetus, eyes, thyroid gland, breasts and gonads, beyond the area of primary examination shall be shielded. (684.155)

X-ray Departments, Equipment and Procedures

811-030-0030 (1) All X-ray departments, equipment and **procedures including fluoroscopy** shall be in compliance with the current rules and regulations of the Oregon State Health Division Radiation Control Section, including but not limited to, the physical design of the department, occupational exposure, collimation, shielding and exposure charts ~~and fluoroscopy~~.

(2) In addition:

(a) The patient shall be an adequate candidate for the radiographic or fluoroscopic procedure employed;

(b) The radiographic field shall be restricted to the area of clinical interest;

(c) Specialized views shall be used any time the area of clinical interest is not clearly visualized on a standard film;

(d) Every exposure, including post-treatment exposures, and scanograms, shall have clinical justification with adequate documentation consistent with the patient's case history;

(e) The operator shall maintain a record on each exposure of each patient containing the

patient's name, the date, the operator's name or initials, the type of exposure and the radiation factors of time, mA, kVp and target film distance, including those exposures resulting in the necessity of repeat exposure for better diagnostic information such as patient motion or poor technical factors. **For computerized and automated systems the recording of technique factors is not necessary as long as the equipment is calibrated and maintained. OAR 333-106-045 requires the facility to determine the typical patient exposure for their most common radiographic examinations, i.e. technique chart.**

(f) Each film shall be properly identified by date of exposure, location of X-ray department, patient's name and number, patient's age, right or left marker and postural position marker; and **indication of the position of the patient;**

(g) The patient with tremors must be immobilized;

(h) The radiographs of a patient with an antalgic posture may be taken in an upright position only if the patient is adequately supported and immobilized to insure diagnostic quality. Otherwise, the recumbent position shall be used;

(i) Upright or postural views shall not be used for any patient whose size exceeds the capacity of the X-ray equipment. Penetration must be adequate on all films;

~~(j) Full Spine (14 x 36 inch) radiographs:~~ ~~(A)~~ Sectional views shall be taken in preference to a single 14 x 36 inch film if the patient's size or height prevents diagnostic quality on a single 14 x 36 inch film;

~~(B)~~ **(k)** If two exposures are made on a single film, the area of exposure shall be critically collimated to avoid double exposure of the overlapping area;

~~(C)~~ **(l)** All views shall employ graduated filtration or adequate devices to attenuate the primary beam for the purpose of reducing unnecessary radiation and to improve film quality. Split screens, gradient or graded screens, paper light barriers inside the cassette, or any other attenuating device in the beam between the patient and the film shall not be permitted, other than the grid controlling scattered radiation.

~~(k)~~ **(m)** A record of radiographic findings on every set of radiographs reviewed shall be included in the patient's permanent file;

~~(l)~~ **(n)** Radiographs shall be kept and available for review for a minimum of seven years or until a minor becomes 18 years of age, whichever is longer. (ORS 441.059, 684.025, 684.150)

STANDARDS

In addition to the legal requirements for taking x-rays in the State of Oregon, the following standards shall apply:

1. The chiropractic physician must make imaging decisions based on a demonstrated need (clinical necessity) and what is best for the patient.
2. Efforts should be made in all areas of the imaging procedure to provide the least possible dose to the patient without compromising image quality.⁹⁰
3. Standard views for a minimum series of diagnostic radiographs are needed to evaluate each region of interest. As a general rule two views 90° to each other should be obtained. Some areas require additional views as an essential part of the minimal diagnostic series.
4. When radiographs are part of a biomechanical analysis it is paramount to evaluate images for pathologies that may weaken bony architecture, requiring modification of therapy
5. The choice of sectional or full spine views is dependant on clinical necessity and the ability to produce diagnostic quality radiographs.
6. Chiropractic Physicians are responsible for ordering necessary and appropriate imaging studies. Relevant pre-existing x-ray studies should be accessed, if possible.

EMEBC – Chapter 3

RECORD KEEPING

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Steering Committee: Current members (as of 6-3-05) Drs. David Day-Chair, Thomas Dobson, Kathleen Galligan, John Colwell, Michael Vissers and Meridel Gatterman.

Delphi Panel: A total of 152 chiropractic physicians participated in the Delphi review, broken down into two groups. Group 1 was doctors who have participated in previous Delphi reviews (88 respondents). This includes six external reviewers. Group 2 was identified from the Oregon Chiropractic Physicians Survey conducted by the OBCE in March 2005 (64) responses.

Section 1

INTRODUCTION

The importance of keeping complete and accurate records cannot be overemphasized. Documentation of patient care is often as important as the rendition of care itself”^[1] Proper record keeping is the documentation of the patient-doctor interaction. This record should be constructed so that it may be understood by others necessary to support a patient’s health and reimbursement needs.

As a critical component of our health care delivery system, the accumulation of essential information, known as a patient record, serves many purposes, including:

- It provides a historical accounting of the patient’s health concerns and treatments. While the actual record belongs to the provider, the information contained within the record belongs to the patient.^[1]^[3]
- Record keeping should facilitate and maintain communication between health care professionals. “...clinicians must ensure that their documentation of a patient’s health status is understood by others on the health care team.”⁴ Each health care provider having access to that record has the same duty to record patient information and ensure that it is safeguarded.^[1, 2, 4, 5]
- Quality record keeping allows a physician or reader to follow the conditions presented by the patient through the evolution of a diagnosis and treatment plan and the patient’s response to the treatment.^[5] The quality of the patient record may be considered a reflection of the quality of patient care.^[1, 5]
- In the context of medico-legal concerns the record serves as the legal instrument to provide “*substantive evidence on whether care rendered met the legal standard of care.*”^[1] “... the courts side with whatever the patient has said ... ‘If it’s not in the chart, from a legal standpoint, either the procedure didn’t happen or the comment wasn’t made’.”^[6]
- The patient record documents the services provided allowing the physician to be properly reimbursed.^[1, 2, 4, 5] “It is often the quality of the documentation, rather than the condition of the patient, that determines the amount of care deemed medically necessary by the insurance company or auditors.”^[7]
- The record should include documentation of informed consent. Any limitations as requested by the patient should also be noted.^[1]
- Patient records have also been used to evaluate physicians for the purposes of teaching, research, and to provide data for public health needs.^[4, 5]
- The information in the record constitutes the foundation for writing accurate reports to health care providers, 3rd-party-payors, attorneys or any other interested parties.^[1, 4]

As many health care systems grow, mature, and interrelate on an ever-increasing basis, the health care record becomes more and more important. “Ultimately, good record keeping is a necessity. It is important to everyone: patient, doctor and staff.”^[2] Each physician has an ethical, as well as legal, duty ^[1] to construct these records in such a manner as to be accurate, legible, complete and organized. ^[1, 3, 4, 6] Finding ways and methods that allow for the most complete compilation of this essential data in a simple and easy manner is a frequent challenge.

There are numerous forms and methods of record keeping available, including standard formats and other organizational systems used throughout healthcare fields.^[1] Each doctor may standardize files in the way best suited to each particular practice. SOAP format is recommended.^[7] “Good decisions are often the result of accurate and complete facts being retrievable from a patient record.” ^[7, 8]

Section 2

RECORD KEEPING

“Each patient shall have exclusive records which shall be sufficiently detailed and legible as to allow any other chiropractic physician to understand the nature of that patient’s case and to be able to follow up with the care of that patient if necessary.”

“It will be considered unprofessional conduct not to keep complete and accurate records on all patients, including but not limited to case histories, examinations, diagnostic and therapeutic services, treatment plan, instructions in home treatment and supplements, work status information and referral recommendations.” Oregon Administrative Rule 811-015-0005(1)

INTERNAL DOCUMENTATION

Patient record

Information contained in the patient file is the foundation of the patient’s permanent record. Each page in the patient file shall contain the patient’s name and/or ID number ^[1] The following additional information shall also be included in the patient file/s:

- Patient identification/pertinent demographic information ^[4, 9-11]
- Patient/case history ^[4, 9-11]
- Examination findings ^[4, 9, 10]
- Imaging, laboratory and special study findings ^[4, 9-11]
- Diagnoses ^[4, 9-11]
- Treatment plan ^[4, 9, 10]
- Chart notes ^[4, 9-11]
- Insurance and billing information ^[4, 9, 10]
- Consent documentation ^[4, 9, 10]
- Reports and other correspondence ^[4, 9, 10]
- Referring physicians ^[4, 9, 10, 12]

Often, the patient record is stored in a folder. The folder itself may also become part of the record if the practitioner writes patient data on the folder, such as personal information, treatment plan, diagnoses, etc.;^[4] however, care should be taken to comply with patient privacy laws (e.g. HIPAA). Outdated portions of the patient record may be removed and stored in an archive file. If this is done, a note should be kept in the active file identifying the location of those records. ^[4, 9, 10]

Doctor/clinic identification

Basic information identifying the practitioner and/or clinic should appear on each page of documentation. ^[4, 9, 10] This information should include:

- Practitioner’s name and professional degree ^[4, 10]
- Facility name (if different) ^[4, 10]
- Street address and mailing address (if different) ^[4, 10]

- Telephone numbers [4, 10]

Patient identification

The record shall clearly identify each patient. [1, 5, 6] This information is often obtained by using preprinted forms that are completed by the patient and *may* include the following:

- Name (prior/other names) [4, 10]
- Date of birth, age [4, 10]
- Gender [4, 10]
- Occupation/employer [4, 10]
- Marital status/spouse's name, occupation [4, 10]
- Name(s) of dependents [4, 10]
- Race [4, 10]
- Address, telephone numbers (home and work) [4, 10]
- Social security number [4, 10]
- Case/file number (when applicable) [4, 10]
- Name of consenting parent or guardian (when applicable) [4, 10]
- Letter of guardianship (when applicable) [4, 10]
- Radiograph/lab identification [4, 10]
- Emergency contact name/number [4, 10]
- Photographs

Patient case history

A detailed case history is an important part of the patient record as it is the foundation of the clinical database for that patient. [4, 10] This information should include an adequate description of the patient's perception of their history. [4, 10] History questionnaires, drawings and other information completed by the patient should be included in the patient record. [4, 10]

Elements of the patient history may include the following:

- Presenting or chief complaint [4, 9, 10]
- Date or time of onset of symptoms [4, 9, 10]
- Description of accident or injury (if applicable) [4, 9]
- Past and present health history [4, 9, 10]
- Family and social history [4, 9, 10]
- Systems review (as appropriate) [4, 9, 10]
- Past and present therapeutic and diagnostic procedures [4, 9, 10]
- Signature of person eliciting history [4, 10]

Examination findings

The results of all examination procedures performed, ordered or requisitioned must be recorded and will become part of the permanent patient record. [4, 9, 10] Objective information is obtained by a physical examination/assessment of the area of complaint and related areas and/or systems. Preprinted and formatted examination forms may be used to facilitate the gathering and recording of this information. [4, 10]

Documentation should include the date of the examination and the name or initials of the examining practitioner.^[4, 10] If abbreviations are used, a legend should be available.^[4, 10]

The examination and diagnostic procedures may include the following:

A. Physical examination

- Vital signs^[4, 8, 10]
- Heart, lung and abdomen^[8]
- EENT^[8]
- Integumentary examination^[8]
- Chiropractic, orthopedic and neurological tests^[4, 8, 10]
- Static and motion palpation of spine and extremities^[8]
- Postural analysis^[8]
- Muscle testing including dynamic, isokinetic, static and manual^[8]
- Functional examination^[13]
- Other

B. Diagnostic Imaging

- Plain film radiography^[4, 8, 10]
- MRI^[4, 10]
- CT^[4, 10]
- Diagnostic ultrasound^[4, 10]
- Radionuclide bone scan^[8]
- Other

Reports with clinical findings should be reviewed, initialed, and dated upon receipt.^[4, 9, 10]

Regarding radiographic examinations, “The operator shall maintain a record on each exposure of each patient containing the patient's name, the date, the operator's name or initials, the type of exposure and the radiation factors of time, mA, kVp and target film distance, including those exposures resulting in the necessity of repeat exposure for better diagnostic information such as patient motion or poor technical factors”^[14]

For computerized and automated systems the recording of technique factors is not necessary as long as the equipment is calibrated and maintained. OAR 333-106-0045 requires the facility to determine the typical patient exposure for their most common radiographic examinations (i.e. technique chart).

“Each film shall be properly identified by date of exposure, location of X-ray department, patient's name or number, patient's age, right or left marker and postural position marker.”^[14]

C. Laboratory

Results of laboratory exams ordered or performed by the physician may include:

- Complete blood count^[4]
- Erythrocyte Sedimentation Rate^[4]
- Urinalysis^[4]
- Chemistry Screen^[4]
- Other

Reports with clinical findings should be reviewed, initialed, and dated upon receipt. ^[4, 9, 10]

D. Special Examinations

Results of special exams ordered or performed by the physician may include:

- Gynecological examination^[8]
- Proctological examination^[8]
- Obstetrical examination^[8]
- Minor surgical examination^[8]
- Electrodiagnostic evaluation^[8]
- Vascular evaluation^[8]
- Psycho-social assessment
- Testicular
- Other

Reports with clinical findings should be reviewed, initialed, and dated upon receipt. ^[4, 9, 10]

Clinical impression or diagnosis

Upon the completion and assessment of the patient's history, subjective complaints, and examination findings, the physician arrives at a clinical impression or diagnosis. The clinical impression or diagnosis must be recorded within the record.^[4, 10, 15] Since they may change with new clinical information, time and treatment, it is important that the clinical impression or diagnosis be dated.^[4, 10] It is not necessary to update this category at each visit, but periodic re-examinations should be performed and the results included in the record along with any change in the clinical impression or diagnosis.^[8]

Accurate recording of the patient's condition frequently requires more than one diagnosis. Of particular concern to the chiropractic practitioner is identification of the biomechanical lesion (subluxation/segmental dysfunction). Recording this information documents the spinal region involved and is the basis for the adjustment/manipulation that is emphasized in chiropractic practice. In addition, the pathoanatomic diagnosis gives the location and severity of specific structures damaged and helps to formulate the prognosis for the patient's condition. A patient may have only a pathoanatomical lesion or only a biomechanical (functional) lesion. However, the biomechanical lesion is most often linked to a pathoanatomical condition.^[16]

Components of the clinical impression/diagnosis may include:

- Phase of lesion^[8] (e.g. acute, subacute, chronic, acute recurrent, chronic recurrent)
- Severity^[4, 8] (e.g. mild, moderate, severe, Grade I, II, III)
- Mechanism of lesion^[8] (e.g. traumatic, postural, overuse, hyperextension, torsional)
- Location^[4, 8] (e.g. spinal level, muscle, ligament, neurological structures)
- Type of lesion (e.g. sprain, strain, subluxation, myofascitis, DJD)
- Neurological involvement (e.g. nerve root involvement, distribution, site of nerve root or cord compression/irritation)
- Complicating/associated factors^[4, 8] (e.g. neurological involvement, DJD, stenosis)
- Resulting anatomical damage or syndrome (e.g. cervicogenic headache, facet syndrome)
- Concomitant pathological diagnoses^[4] (e.g. COPD, neoplasm, CHF, HTN)

Treatment plan

The treatment plan is the portion of the patient record that deals with the proposed action by either the treating physician or the patient.^[17] The plan arises from the accumulation of clinical data and the initial clinical impression or diagnosis.^[4, 10] The treatment plan must be recorded in the patient file.

The treatment plan should include, when applicable:

- The prescribed therapeutic treatment plan (including modes, frequency and duration of care)^[4, 10, 17]
- Additional diagnostic testing recommended or being considered^[4, 10]
- Reassessment schedule^[4, 10]
- Patient education and self-care plan^[4, 10, 17]
- Referrals or consultations^[4, 10, 17]
- Goals and outcome measures

Chart/progress notes

"Every page of chart notes will identify the patient by name, and the clinic of origin by name and address. Each entry will be identified by day, month, year, provider of service and author of the record."^[3] Oregon Administrative Rule 811-015-0005(1)(b)

Chart notes (often referred to as progress notes) are made in a patient's chart to record the patient's state of health, what transpired during patient visits as well as any significant changes in the clinical picture, assessment or treatment plan.^[4, 8, 10] Chart notes should document the patient's response to the physician's management of their case. All record should be made in a systematic and organized manner^[4, 8, 10] The

record shall be legible and clear enough to allow a peer to assume management of the case after an initial review of the chart notes.^[1, 8]

Since the 1970s the classic format has been known as “S.O.A.P.” notes.^[17] S.O.A.P. is an acronym for Subjective, Objective, Assessment, and Plan or Procedures.^[7] This pertinent clinical information can be organized in the SOAP format in a variety of ways. While full S.O.A.P. charting at each visit is strongly recommended, it is not required. Components of the record should include:^[8]

Subjective complaints: These should be in the patient’s own words when possible, indicating improvement, worsening or no change.^[8]

Objective findings: Changes in the clinical signs of a condition should be noted at each visit in the doctor’s own words.^[8]

Assessment or diagnosis: It is not necessary to update this category at each visit. However, periodic clinical reevaluations should be performed and these results included in the daily entries with any modification of the diagnosis.^[18]

Plan of Management: A provisional plan of management should be recorded initially and further entries made as this plan is modified and/or as a patient enters a new phase of treatment. Changes in procedures should be noted.^[18] Daily recording of procedures performed should include adjustment/manipulation performed (for example, direction and force of the thrust), soft tissue techniques, modalities used (including time, location and intensity), exercises prescribed, nutritional supplementation or prescribed diet and activity instructions or advice. Any significant adverse response to therapies should be noted.^[18]

Financial records

Financial records may be kept in the patient record and may include the following:

- Patient account ledgers (including date and type of services billed, payments received and from which source, account balance)^[4, 15]
- Billing statements^[4]
- Insurance records (explanation of benefits, proof of payment, etc.)^[4]

Internal memoranda regarding patient

Internal memoranda regarding individual patients should be kept in the patient record and may include the following:

- Intra-office staff messages^[4]
- Phone messages and/or summaries of phone conversations^[4]
- Copies of emails sent/received^[4]
- Copies of sign-in sheets^[4]

Any correspondence sent out of the treating practitioner’s office should contain the doctor and clinic name and address, phone number and current date.^[19]

Electronic records

The computerization of the medical record has accelerated rapidly in recent years. The use of electronic or computer-assisted record keeping systems is becoming more common in chiropractic offices. These systems may include computer-assisted writing, voice recognition or other developing technologies.^[17] Some systems accept input not only from the computer keyboard, but from touch screens, light pens, scanners and other input devices.^[17] If an electronic record-keeping system is used, the provider needs to take reasonable steps to ensure the system is so designed and operated that the record is secure from loss, tampering, interference or unauthorized use or access and complies with all state and federal confidentiality regulations.

EXTERNAL DOCUMENTATION

External documentation includes relevant information received from an outside source and may include correspondence from numerous sources: referring physicians, other previous/concurrent practitioners, attorneys, various pay groups, consultative reports, diagnostic studies, etc. The original of each of those relevant external documents, if available, should be kept in that patient's record.^[4, 10, 19]

Any external clinical documents such as reports or diagnostic studies should be initialed, dated and included in the patient's file. This notation provides evidence that the document has been read by the doctor.^[1, 3]

CHART/FILE ORGANIZATION

General

Records should be entered in the sequence events took place, and kept in chronological order.^[4] Records should be neat, legible, organized and complete, and recorded in dark ink or other permanently retrievable method within 24 hours of occurrence.^[1, 4, 9, 20] The record should never be backdated, erased, deleted or altered in any way.^[4, 21] If corrections need to be made, a line should be drawn through the error and the change initialed and dated.^[4, 15] If records are kept electronically, amendments should be made in such a way that preserves the original record. Records must be complete enough to provide the practitioner with enough information for subsequent care or reporting to outside parties.^[4]

Preprinted Forms

Forms may be used based on the practitioner's discretion. Forms provide an orderly means of obtaining the history, noting examination findings and charting progress.^[4] If preprinted forms are used, they should include appropriate doctor/clinic identification.^[6, 22] If part of a form does not apply to a practitioner's practice, the section should be deleted and the form reprinted.^[23]

Abbreviations/Symbols

"Recordable abbreviations and terminology should be internally consistent and a key for these abbreviations must be available."^[9] All records sent to a third party should be accompanied by a legend of codes or abbreviations used.^[1, 6, 20, 23]

MAINTENANCE OF RECORDS

Oregon Administrative Rules

Records

811-015-0005 (1) It will be considered unprofessional conduct not to keep complete and accurate records on all patients, including but not limited to case histories, examinations, diagnostic and therapeutic services, treatment plan, instructions in home treatment and supplements, work status information and referral recommendations.

811-015-0005 (3) A patient's records shall be kept by the Chiropractic physician a minimum of seven years. If the patient is a minor, the records shall be kept seven years or until the patient is 18 years of age, whichever is longer.^[24]

Disclosure of Records

811-015-0006 (1) A Chiropractic physician shall make available within a reasonable time to a patient or a third party upon the patient's written request, copies or summaries of medical records and originals or copies of the patient's X-rays.

(a) The medical records do not necessarily include the personal office notes of the Chiropractic physician or personal communications between a referring and consulting physician relating to the patient.

(b) The Chiropractic physician shall preserve a patient's medical records from disclosure and will release them only on a patient's written consent stating to whom the records are being released or as required by State and Federal law.

(2) The Chiropractic physician may establish a reasonable charge to the patient for the costs incurred in providing the patient with copies of any portion of the medical records. A patient shall not be denied summaries or copies of his/her medical records or X-rays because of inability to pay or financial indebtedness to the Chiropractic physician.^[25]

Confidentiality

All patient/doctor communications and interactions are privileged and confidential. This is an ethical responsibility as well as a statutory and/or regulatory one.^[4, 10, 15] All information regarding a patient must be kept confidential unless its release is authorized by the patient or is compelled by law.

Assurance of confidentiality is necessary if patients are to be open and forthright with the practitioner. Patients have the right to expect that information regarding their health will remain private and secure from public scrutiny.^[4, 10, 26] The unauthorized disclosure of patient records by a physician may create legal liability unless the disclosure is to an authorized source, authorized by law, or justified by a superior public interest.^[27] A patient who is injured by disclosure of his or her confidential information may pursue legal remedies against the providers not only for breach of privacy, but also for breach of implied contract of confidentiality, malpractice and/or infliction of emotional distress.^[26]

The doctor is responsible for staff actions regarding record keeping. Any employee involved in the preparation, organization, filing, or discussion of records should fully understand professional and legal requirements, including the rules of confidentiality.^[4, 10, 28]

Records Retention and Retrieval

Health records should be retained in a way that facilitates retrieval. To the extent possible, they should be kept in a centralized location. In most circumstances, recent records are maintained on premises either as hard copy or electronically. After a period of time they can be archived, microfilmed or microfiched and placed in storage.^[4, 10] While there are administrative rules governing the length of time that records must be kept, from a patient and risk management perspective, it is desirable for all records to be retained indefinitely by the physician.^{[26],[29]}

If a chiropractic office closes or changes ownership, secure retention of the health care record must be ensured. Arrangements should be made through wills or estate plans for the orderly transfer of patient records to another doctor or to a special administrator or caretaker of the records.^[22] If health records are to be destroyed, they must be disposed of in a manner protective of patient confidentiality.

Administrative Records

Administrative records are primarily those relating to the non-clinical side of practice, and may include telephone logs, schedules and appointment records, patient personal information, insurance forms and billing documents. These records can be kept separately from the patient file, but they must be maintained in a legible and retrievable form.^[4, 10]

Records Transfer

It is mandatory that health care data requested by another provider currently treating a present or former patient be forwarded upon receipt of an appropriate request and patient consent.^[4, 9, 10] When responding to a request for patient records, determine whether all or only part of the record is requested. If the nature of the request is not clear, an inquiry to the person making the request will usually clear up what material is required. A subpoena asking for “all medical records pertaining to the care and treatment of ‘patient x’ between January and June 1995” means that the physician is to produce all medical records for ‘patient x’ between those dates regardless of the source. A request for “all records documenting your care and treatment of ‘patient x’ means all records of the physician’s own care, not someone else’s.”^[30]

Electronic Records

When records are kept electronically, they must be protected by proper back-up, firewall and confidentiality/security procedures. Increased use of electronic mail, the Internet and remote access creates new opportunities for tampering. This may result in errors of data identification, authentication, availability, and integrity. Availability refers to the ability of an authorized user to access the medical information. Integrity describes the system’s capability to prevent outsiders and/or unauthorized insiders from altering data and unauthorized access.

The federal laws that are most relevant to electronic communications include the Electronic Communications Privacy Act of 1986 (ECPA), 18 U.S.C. 2510 et seq., and the Health Insurance Portability and Accountability Act of 1996 (HIPAA), 42 U.S.C. 1320d. HIPAA requires health care providers and health plans to “maintain reasonable and appropriate administrative, technical and physical safeguards (a) to ensure confidentiality of the information, and (b) protect against (i) threats or hazards to the security of the information; and (ii) unauthorized uses or disclosures of this information.”^[28]

Chiropractic Records Ownership Management and Responsibility

The content of the medical record is owned by the patient; however, the physician has the obligation to maintain the record intact for the use of the patient and to copy it upon request.^[30] Upon receipt of a properly executed release of records request, a chiropractic physician shall make available copies or summaries of medical records to the patient or third party within a reasonable time.^[25] Although Oregon Law allows release of records under certain circumstances without patient approval,^[31] it is strongly recommended prior to release of any records, a properly executed authorization be in place for the full protection of the patient and physician.

When a practice is closed, sold or there is a transfer of ownership, secure retention of the records must be ensured.^[4] If a single physician's office is closed, that physician remains responsible for maintenance of records for a minimum period of time, i.e. for adults seven years or for a minor patient, seven years or to the age of 18 whichever is longer.^[24] In the case of a group practice closure, the issue of record keeping/maintenance may be dealt with by a contractual agreement.^[32] File transfers resulting from the sale/purchase of a practice must follow statute, regulations and policies to ascertain whether a patient authorization is required at the time of the file transfer.^[32] If the seller does not keep a copy of the files, the contract/agreement covering the transaction should impose an obligation upon the purchaser to maintain the records and allow access to them by the seller in order to satisfy their professional obligations.^[32]

Management of healthcare records in a single physician's office is a relatively straightforward situation where that physician is responsible for all aspects of records management. A more complex set of circumstances occurs when considering records management within the context of a multiple physician/group practice where dissolution, sale, closure or other change is taking place. Many of the potential difficulties with respect to maintenance of records in this type of situation can be avoided with proper contractual arrangements established at the outset of the relationship.^[32] Contracts should anticipate the necessity for providing the physician with copies and should establish whose duty it is to provide and pay for duplication.^[30] If physicians choose not to retain copies, a release should be obtained from each patient involved guaranteeing access to the records in the future, should the need arise.^[30] Keeping a copy of all records after dissolution of a contractual relationship is expensive but vital.^[30]

Virtually all state disciplinary actions and malpractice suits turn on the content of the record.^[30] The physician who does not maintain custody is at the mercy of the others who may lose, alter or attempt to deny access to records essential to their own defense.^[30] Perhaps the best way for the physician to ensure access to the records (e.g. employment contracts, managed care groups, nursing homes, etc.) is to have the patient sign a release (preferably at the initial visit) entitling the physician to obtain complete copies of any medical records containing information related to that physician's care of the patient.^[30]

Within the context of a physician leaving a practice, the dissolution of a group practice, or an associate physician arrangement, there are several different scenarios that require further discussion with respect to records management.

- If a patient has been seen by more than one physician, the original file or a copy should be maintained at the clinic.^[32]
- If the original file is removed, a signed, dated authorization form should be received from the patient directing that file be provided to a specific practitioner.^[32]
- If the patient has been seen only by the remaining physician/s, a copy may be provided to the departing physician with a signed, dated authorization form.^[32]

- If the patient has been seen only by the departing physician/s, no consent form is necessary to remove the file unless the file was opened in the name of a group practice or there is a separate agreement stating all records are the property of the clinic.^[32] In this case, a copy or the original should be maintained at the clinic and a written authorization for transfer of records out of the facility is required.^[32]
- With respect to files where radiographs are involved, due to the costly nature of reproduction, the original films should be kept as part of the original file.^[32]

When a practice facility changes status, e.g. purchase/sale, dissolution of a contractual relationship, etc. the most vital concerns with respect to records management are maintenance of privacy/confidentiality and ensuring intact records are readily accessible for the benefit of the patient/s healthcare. In a multi-physician/group practice, an explicit contract defining the responsibilities of all parties involved is a critical component of ensuring proper maintenance of records.

PATIENT CONSENTS

Informed consent must be recorded for evaluation and treatment, treating a minor, obtaining or releasing health records, taking and releasing photos or videos, participation in research or inclusion in publication.^[12] The original of any signed written form regarding these consent issues belongs in the patient file.

While legal experts are strong advocates of written consent forms,^{[4], [10]} doctors are reminded that forms may not provide full protection against lawsuits.^{[33] [17]} Whether written or verbal, informed consent for evaluation and treatment should include a discussion with the patient and should be documented as a PARQ conference. For further discussion of informed consent including the PAR/PARQ notation, refer to the Patient/Doctor Relationship Chapter.

Written forms for the release or procurement of health records are required. Written forms for permission to treat a minor are recommended.^[17, 34] If a second doctor observes and/or treats the patient, a second consent is necessary.^[33]

MALPRACTICE TIPS

Today's practice environment requires careful documentation of patient care.^[35] The patient as a plaintiff has the burden of proving that a health care professional has acted negligently.^[36] **The most useful factor defending against an accusation of malpractice is the record,**^[6] and risk-management is the best line of defense.^[6, 36] Patient records allow the professional to show that *proper* rather than negligent care was provided.^{[36], [23]}

The legal definition of malpractice includes four criteria:^[6]

- 1) There must be a duty between the two parties, i.e. a patient/doctor relationship.^[3]
- 2) There must be a breach of that duty, i.e. something wrong has to have occurred between the two parties.^[3]

(Note: Anger toward the doctor is the most frequent instigating factor.^[6])

- 3) Harm or injury must result from that breach of duty.^[6]
- 4) There has to be ‘proximate cause’, i.e. a relationship in time between the breach and the injury.^[6]

If a lawsuit occurs and the patient file (including all billings^[6]) cannot be provided or is incomplete, inaccurate or illegible^[23], the doctor could be found liable even though not at fault.^[6] If documents are lost and not included or billings are not provided (even though the doctor may have not known they needed to be included), the doctor’s credibility may be compromised.)

In the event a potential malpractice situation actually does occur, the chiropractic physician should stay calm and act responsibly. The physician should avoid repeating the procedure, monitor the patient, follow any risk-management procedures as outlined by your insurance company and document the incident. The chiropractic physician should contact legal counsel prior to meeting with the plaintiff(s) and/or their attorneys.^[6]

The following is a list of suggestions, habits and/or *risk-management techniques* that create good patient records:

- Stay within licensure boundaries.^[22]
 - (See the Chapter 811 Oregon Administrative Rules for those details.)
- Explain procedures and treatments as care proceeds.^[6]
 - This treatment narration aids in building rapport with the patient which has been shown to be one of the best defenses against anger and/or malpractice behaviors.^[6]
- Make accurate statements about the prognosis.^[6]
 - Avoid exaggeration of what may be achieved from the treatment^[6]
- Records should not be edited or altered even for the most innocent reason^{[35], [36], [37]}
 - Refuse a request to “change” a record.^[22]
 - Deliberately changing or altering a record can be considered a fraudulent action.^[35]
 - Most malpractice carriers have a clause which voids coverage in the case of hiding any important information, misleading, attempting to defraud or lying.
- If asked to not make a record, consider the legal obligations.
 - Failure to comply with these obligations may result in severe penalties.^[6]
 - Explore the motive behind the request (the wish to not weaken one’s battle in court, to avoid stigma for political or other reasons, celebrity status, a concern about possible embarrassment, paranoia, abuse^[22]).
 - Suggestions for refuting the request without offending the patient include
 - 1) acknowledge and gently allay concerns,
 - 2) explain the need to keep a record,
 - 3) describe your confidentiality procedures (e.g. the HIPAA protections),
 - 4) negotiate some acceptable form of recording and/or write only the minimum needed to convey reasonable care has been delivered,
 - 5) consider refusing the case.^[22]

- Correct errors with a line, signature or initials, and date it ^{[1], [23], [30], [38]}
 - Avoid obliteration of any entry ^[39]
 - Learn to think: “The first draft is the final product”^[1]
- Use the SOAP or equivalent format for office notes and progress notes. ^{[1], [6], [23]}

Have patient’s name, chart number (if used), doctor/clinic identification on every page of chart notes. ^{[1], [40], [39]}

- Date and sign/initial every entry. ^{[1], [6], [39]}
- Write legibly ^{[35], [23], [1]} in dark ink; ^{[1], [39]}
- Use standard abbreviations; ^{[1], [6], [23]} ^[39]
- Use the patient’s own words to describe how they are feeling; ^[6]
- Make an assessment about the patient’s progress; ^[6]
- Avoid signing/initialing any entry not written by you. ^[1]
- Have staff sign their own entries, then the chiropractic physician may countersign the entries; ^[39]
- Make a habit of charting upon occurrence to avoid omissions. ^[30] Make your entries within 24 hours of contact; ^{[1], [30]}
- Chart the procedures and/or treatments that occurred during that date of service, including any recommended home treatments; ^[6]
- Avoid blank spaces between dates of service; ^{[1], [39]}
- Computer-generated and written chart notes must be sufficiently individualized to accurately reflect the clinical findings at each visit;
- Record patient’s relevant family, marital, and job stresses; ^{[1], [39]}
- Proof read *and initial* dictated records; ^{[6], [23]}
- Attempt to document every patient contact ^[30] such as telephone calls, emails, etc. ^{[6], [23], [39]}
- Record a full and complete history and physical examination. ^{[23], [37]} Make a diagnosis only after an appropriate physical examination ^[6]
 - Record the relevant facts accurately ^{[1], [35], [37]}
 - Chart the negative as well as the positive. ^[39] Avoid exaggeration or making the patient sound worse than he/she is. ^[39]
 - Use objective, non-judgmental, language. ^{[1], [6], [23], [39]}
 - Write an opinion supported by the relevant facts. ^[35] Include your recommendation for follow-up and ^{[23], [39]} include any prescription(s) given ^{[1], [6]}
- Avoid recording derogatory, trivial or loose comments about or from patients and/or other health care professionals. ^{[1], [35], [39]} Avoid egotistical remarks. ^[39]
- Document all procedures or treatments recommended by the doctor and refused by the patient, including any non-compliance of treatment recommended by other health care professionals. ^{[1], [23], [37], [39]}
- Chart important events or adverse reactions conspicuously, rather than burying them in the record. ^[39]

- Consider including a written informed consent in the file ^[1, 6, 23]
 - Oregon Administrative Rules do not *require* this document, but many legal sources recommend the use of a form. (*Read 'Informed Consent' in the Patient/Doctor Relationship chapter of this volume.*)
 - Whether a form is used or not, include a notation documenting your consent discussion with the patient.^[39]
- Tailor forms to your individual office. ^[37]
- Respond to each Request for Records, releasing only the information specifically requested. ^[30]
 - *Before releasing any records, be certain to meet compliance with state and federal privacy guidelines.* ^[35]
- Retain all original records. ^[37]
- Records should be kept according OAR 811-015-0005.
 - The rule states “...a minimum of 7 years. If the patient is a minor, the records shall be kept seven years or until the patient is 18, whichever is longer” ^[24]
 - Protect patient confidentiality (refer to Section III - HIPAA).^[35]

Implement a system to ensure that important patient information can be located and is easily accessible. ^[23]

Section 3

HIPAA - HEALTH INSURANCE PORTABILITY AND ACCOUNTABILITY ACT OF 1996

The following material is a summary of Federal Law.

With the advent and extensive use of electronic media in the health care realm, there is a greater possibility of widespread dissemination and abuse of a patient's Protected Health Information (PHI). "Protected Health Information means individually identifiable health information created, maintained or in the possession of our practice relating to the past, present or future physical or mental health of any individual, the provision of health care to an individual, or the past, present or future payment for the provision of health care to an individual." ^[41] Even if the information provides a reasonable basis to believe it can be used to identify an individual, it is considered individually identifiable health information. ^[42]

In August 1996 the Health Insurance Portability and Accountability Act (HIPAA) bill was passed giving the Federal Government the ability to regulate how covered entities (health care plans, providers, and clearing houses) use, store, disclose and transmit Protected Health Information.

Prior to the passage of HIPAA there were no national or industry standards mandating or regulating the privacy and confidentiality of a patient's PHI. Individual states had a variety of rulings related to patient privacy and disclosure of PHI that were very often disjointed and incomplete. HIPAA provides national standards for the protection and security of one's PHI, while improving the efficacy of healthcare provision by providing standards for transmitting patient's financial information to which all covered entities must adhere. The Privacy Rule holds violators accountable by imposing civil and criminal penalties. HIPAA generally encompasses two rules- The Privacy Rule and the Security Standard. The Privacy Rule, (Standards for Privacy of Individually Identifiable Health Information), regulates the use and disclosure of PHI and encompasses three essential purposes. The first purpose is to protect the rights of patients by providing them access to their PHI and the ability to control the use and disclosure of it. The second purpose is to restore public trust in the healthcare delivery system, and the third is to improve the efficiency and effectiveness of healthcare delivery in the US by creating a national framework of healthcare privacy. ^[43]

The Privacy Rule provides the first national standards for protecting the privacy of health information. It mandates how covered entities (healthcare plans, providers, and clearing houses) use, store, disclose, and transmit PHI. It sets boundaries on the use and disclosure of medical records, by requiring safeguards that most healthcare entities must provide to protect the privacy of health information. It encompasses the practitioner's use of the patients' PHI within their office or health care setting and the disclosure of PHI outside of the office setting. It states that protected health information can only be used and disclosed for treatment, payment, or healthcare operations without a patient authorization. Any other uses require a patient authorization prior to the PHI being released. The rule also generally limits the release of information to the minimum necessary for the purpose of the disclosure so that irrelevant information is not released unnecessarily. This limitation of only releasing the minimum necessary information does not apply when the PHI is disclosed to another practitioner for direct treatment purposes. The rules make allowances with public health responsibilities as well to allow the collection of information used to prevent or control disease, injury, disability, including public health surveillance, investigation and intervention.

The HIPAA limitations do not apply to information that is de-identified so that the patient can not be connected with their PHI. The following is a table listing what is considered identifiable information:

Identifiable Information

1. Name
2. Any address specification such as street, city, county, precinct, and zip code
3. All dates except for the year including birthdates, admission date, discharge date, date of death and all ages over 89
4. Telephone number
5. Fax number
6. Electronic mail address
7. Social Security number
8. Medical record number
9. Health plan beneficiary number
10. Account number maintained by the healthcare provider
11. Certificate or license number such as driver's license number
12. Vehicle identifier and serial number including license plate number
13. Medical device identifier and serial number such as pace maker serial number
14. Web site address
15. Internet protocol (IP) address number
16. Biometric identifier including finger and voice prints
17. Full face photographic images and any comparable image, and
18. Any other unique identifying number characteristic or code

Table courtesy of HIPAA Privacy Manual A how-to Guide for Your Medical Practice 2nd Edition. Developed by Gates, Moore & Co. for The American College of Obstetricians and Gynecologists. 2002

Beyond limiting the practitioner's ability to use or disclose PHI without a patient's authorization, the Privacy Rule empowers patients to have more control over their health information. The first step in providing the patient with more control is the mandatory requirement of each health care provider to provide the patient with a copy of the "Notice of Privacy Practices." If the initial contact with a patient is electronic, then an electronic copy of the Notice of Privacy Practices must be provided at that time. The Notice of Privacy Practices outlines the patient's rights to privacy and how personal health information will be routinely used for treatment, payment and healthcare operations within the healthcare setting. The provider must also obtain a written acknowledgment from the patient that a copy of the notice was received.^[44]

Release of PHI for purposes other than treatment, payment or healthcare operations requires a signed authorization from the patient. This allows patients to make informed choices about how their individual health information may be used and/or disclosed. The HIPAA privacy rules go beyond requiring an authorization for release of information by requiring tracking what disclosures of PHI have been made. This enables patients to find out how their health information has been used or released. The patient also has the right to obtain a copy of their medical record and can review and correct or amend the PHI. There must be policies and procedures in place for patient review, correction or amendment of their PHI. The provider is not required to change medical records at the request of the patient, but they should be able to link the amended information to the original chart. Corrections or amendments to the health record requested by the patient can only be made with their physician's approval.

To assure that the HIPAA privacy rules are enforced, health care providers are required to designate a privacy officer within the clinic. This person is responsible for implementing the privacy rules. There should also be a designated contact person, who may be the same individual, to receive complaints and provide information to the public related to the privacy policies. The final piece of the privacy rules relates to the need for staff education related to patient privacy and their responsibilities to comply with the HIPAA regulations. There should be documented education with all staff and appropriate policies and procedures in place to demonstrate that the office is doing their due diligence in assuring that the patient's privacy is maintained. The office should also look at their routine operations and make a concerted effort to minimize the chance for inadvertent disclosure of PHI due to processes in place such as leaving patient records in plain sight at the receptionist's desk or having computer screens with PHI easily visible in areas where patients are present.

The other rule HIPAA encompasses is the Security Rule which is composed of two major standards; the security standard and the electronic signature standard ^[45]

The Security Standard requires a secure electronic environment in which a covered entity would maintain, store, or transmit all PHI. The rule defines and requires a secure electronic environment as; an environment with physical, procedural, technical and administrative procedures, services, and mechanisms.

What is a Secure Electronic Environment?

A **Secure Electronic Environment** is an environment that has administrative procedures, physical safeguard and technical security services and mechanisms in place. It also includes the implementation of an electronic signature standard if the practice uses an electronic signature.

Administrative Procedures are formal, documented practices to protect PHI. This includes the selection and execution of security measures and the management of personnel as it relates to protecting PHI.

Physical Safeguards are procedures to protect computer systems, buildings and other equipment from fire and other natural and environmental hazards, as well as from intrusion.

Technical Security Services are processes that are implemented to control and monitor access to PHI such as passwords.

Technical Security Mechanisms are processes implemented to prevent unauthorized access to data that is transmitted over a communications network (Internet, Intranet, fax machine, etc.)

Table courtesy of HIPAA Privacy Manual A how-to Guide for Your Medical Practice 2nd Edition. Developed by Gates, Moore & Co. for The American College of Obstetricians and Gynecologists. 2002

The Electronic Signature Standard

An electronic signature is a data component that is incorporated into an electronic document for the purpose of uniquely identifying the signer. Practices are not required to use electronic signatures, however if a provider uses electronic signatures, then the Security Standard Rule requires that HIPAA signature standards be used to verify the identity of the message sender, or the signer of a document. ^[46]

With the implementation of HIPAA regulation, the government has imposed national rules and standards that will greatly improve the security of a patient's protected health information, while giving them more control over where and how it can be used. Securing and standardizing the electronic environment will greatly expedite and secure the transfer of data and Protected Health Information.

Section 4

PRACTICE STANDARDS

1. The content of the medical record is owned by the patient; however, the physician has the obligation to maintain the record intact for the use of the patient and to copy it upon request.³⁰
2. Upon receipt of a properly executed release of records request, a chiropractic physician shall make available copies or summaries of medical records to the patient or third party within a reasonable time.²⁵
3. Clinicians must ensure that their documentation of a patient's health status is understandable by others on the health care team.⁴
4. The patient record must include documentation of informed consent.
5. Whether written or verbal, informed consent for evaluation and treatment should include a discussion with the patient and should be documented as a PARQ conference.
6. Recordable abbreviations and terminology should be internally consistent and a key for these abbreviations must be available upon request.⁹
7. The record should never be backdated, erased, deleted or altered in any way.^{4,21} If corrections need to be made, a line should be drawn through the error and the change initialed and dated.^{4,15} If records are kept electronically, amendments should be made in such a way that preserves the original record.
8. All information regarding a patient must be kept confidential unless its release is authorized by the patient or is compelled by law.
9. The doctor is responsible for staff actions regarding record keeping. Any employee involved in the preparation, organization, filing, or discussion of records should fully understand professional and legal requirements, including the rules of confidentiality.^{4,10,28}
10. If a chiropractic office closes or changes ownership, secure retention of the health care record must be ensured.⁴
11. When records are kept electronically, they must be protected by proper back-up, firewall and confidentiality/security procedures.
12. Reports with clinical findings received from external sources should be reviewed, initialed, and dated upon receipt.^{4,9,10}
13. The clinical impression or diagnosis must be recorded within the record.^{4,10,15} When more than one diagnosis is made (for example, biomechanical assessment and pathoanatomic diagnosis), these must be differentiated and recorded.¹⁴

Section 5

REFERENCES

1. Scott RW, *Legal aspects of documenting patient care*. 1994; p. 31-82.
2. Maule K, *Record Keeping: Is it really that important?* Journal of the American Chiropractic Association, 2000(June 2000): p. 20-22.
3. *Oregon Administrative Rules Chapter 811*. 2003.
4. Haldeman S, Chapman-Smith D, and Peterson DM, *Guidelines for Chiropractic Quality Assurance and Practice Parameters*. 1993, Aspen Publishers, Inc: Gaithersburg, MD. p. 222.
5. Ventura JM, Justice BD, and Iannelli GC, *Developing a quality-based chiropractic practice*. Chiropractic Technique, 1997. **9**(4): p. 157-161.
6. *Malpractice: Without conscientious care and record keeping, you could lose it all*. Journal of the American Chiropractic Association, 1999: p. 6-14.
7. Behmlander JL, *Documentation: Create better reports faster*. Journal of the American Chiropractic Association, 2001(February 2001): p. 44-45.
8. OBCE, *Oregon Chiropractic Practices and Utilization Guidelines*. 1991: Oregon.
9. *Clinical Guidelines for Chiropractic Practice in Canada*, Canadian Chiropractic Association.
10. *International Chiropractic Association Guidelines protocol*, International Chiropractic Association. p. 197-198.
11. Reinke TS and Jahn WT, *Preventing legal suicide with medical records*. J Manipulative Physiol Ther, 1988. **11**(6): p. 511-3.
12. College of Chiropractors of Ontario, *Record Keeping: Standard of practice*. 1996: Ontario Canada. p. 1-4.
13. Liebensen C, *Rehabilitation of the spine: A practitioner's Manual*. 1996, Baltimore: Wms & Wilkens.
14. *Oregon Administrative Rules Chapter 811*. 2003.
15. Can Chiro Assn, *Clinical Guidelines for Chiropractic Practice in Canada*.
16. Gatterman MI, *Chiropractic management of spine related disorders*. 2003: p. 435.
17. Yeomans SG, *The Clinical Application of Outcomes Assessment*, Stamford CT: Appleton & Lange. Ch 20.
18. OBCE, *Oregon Chiropractic Practices and Utilization Guidelines - Chapter 3*, in *Ch 3 - Record keeping and report writing*. 1991: Oregon.
19. Metz RD, *The chiropractic clinical record and quality management as viewed from the perspective of the insurance payer*. Top of Clin Chiropr. Vol. 7. 2000: Aspen Publishers, Inc. 61-66.
20. Baker SK, *The 25 warning signs of poor documentation*. American Medical News, 1996: p. 22.
21. NCMIC Examiner, National Chiropractic Mutual Insurance Company Examiner, 2003(Spring 2003).
22. Gutheil TG and Hilliard JT, *Don't write me down*. American Journal of Psychotherapy, 2001. **55**(2): p. 157-165.
23. NaPier PM and NaPier BL, *Medical charts and malpractice: How to avoid costly errors and omissions*. Hawaii Medical Journal, 1989. **48**(1): p. 596-7, 599,607.
24. *Oregon Administrative Rules Chapter 811*. 2003.
25. *Oregon Administrative Rules Chapter 811*. 2003.
26. Theisler CW. *Legal aspects of chiropractic practice*. in *NCMIC Malpractice Avoidance Seminar*.

27. Hirsh H L and B. MS, *Physician Responsibilities in Medical Record Keeping*. Journal of the Medical Society of New Jersey. **77**(6 Jun 1980): p. 406-7.
28. *Health Insurance Portability and Accountability Act*, in *Title 1*. 1996.
29. Kopf R, *The medical record: Make it your asset, not a liability*, in *APMA News*. 1999. p. 42-45.
30. Harty-Golder B, *The Back-Pocket Lawyer - For the record*. Journal of the Florida Medical Association, 1995. **82**(11): p. 769-772.
31. Statute, O.R., *House Bill 2305 Authorization to Release Confidential Records*. 2003.
32. Freedman AM, *Transfer of patient files*. J Can Chiro Assoc, 1999. **43**(3): p. 189-191.
33. Gorney M, Martello J, and Hart L, *The Medical Record: Informing your patients before they consent*. Clinics in Plastic Surgery, 1999. **26**(1): p. 57-68.
34. Weintraub M, *Documentation and informed consent*. Neurologic Clinics, 1999. **17**(2): p. 371-381.
35. Hirsh, H.L. and J. Bromberg, *Physician responsibilities in medical record keeping*. J Med Soc N J, 1980. **77**(6): p. 406-7.
36. Cross AT, *Perspectives in Practice: Legal requirements of private practice medical records*. Journal of the American Dietetic Association, 1988. **88**(10): p. 1272-1274.
37. Rondberg TA and Feuling T, *CBS: Malpractice Prevention Program*, Chiropractic Benefit Services. p. 12-13, 19-29.
38. Hirsh HL and Bromberg J, *Featuring: Physician responsibilities in medical record keeping*. Journal of the Medical Society of New Jersey, 1980. **77**(6): p. 406-7.
39. Baker SD, *The 25 warning signs of poor documentation*. American Medical News, 1996: p. 22.
40. *Oregon Administrative Rules Chapter 811*, in *Chapter 811*. 2003.
41. Brown and Rudnick, *eSolutions.Definitions*, Brown, Rudnick.
42. US DHHS, *Health Insurance Portability and Accountability Act*. 2002.
43. Gates and Moore & Co., *HIPAA Privacy Manual - A how-to guide for your medical practice*. 2nd ed, ed. M.C. Gates. 2002.
44. Conklin S, *Medical Privacy and Data Security: HIPAA Privacy Handbook*, ed. O.M. Assn. 2001: Cooney & Crew, LLP.
45. *HIPAA*, in *45 CFR*. 2003. p. 8334-8381.
46. Prady et al, *Guidelines for electronic communications with patients*. J AM Med Inform Assn, 2001. **8**: p. 344-8.

PURNELL Mackenzie G * BCE

From: PURNELL Mackenzie G * BCE
Sent: Tuesday, May 17, 2022 11:03 AM
To: COMMENT Public * BCE
Subject: Proposed change to CE requirements comment

From: RThomas <hillcrestchiro@gmail.com>
Sent: Tuesday, May 17, 2022 10:30 AM
To: OBCE Oregon * BCE <info@obce.oregon.gov>
Subject: Proposed change to CE requirements comment

Dear Board Members,

My comments concern the proposed changes to CE requirements may or may not be late but I would appreciate that my comments be recorded.

The new proposed CE language that annual hours for NBCE testing participation be limited to 6-hours does not take into consideration the knowledge base or expense associated with being a participating NBCE examiner.

The total timeframe for participation is approximately 12-14 hours which includes examiner standardization, cultural competency training, and face-to-face skillset testing. Knowledge base information includes history, orthopedic, neurological, and technique components.

Examiner participation often includes long distance travel, lodging, and meals expenses.

Decreasing the maximum hours from 13 to 6 will ultimately result in a decrease in examiners due to the known time and monetary expenses noted.

Interestingly enough, the proposed CE changes allow for 2-hours of CE for merely attending an OBCE meeting where no training and no knowledge base is required.

I urge the board to re-consider the reduction in NBCE allowable CEs and to maintain a minimum of 13-hours per year because of the knowledge base required and expenses incurred when participating in NCBE testing.

Thank you for your time.

Sincerely,

Ryan M. Thomas, DC, DIANM

MASK-INEFFECTIVENESS	
1) Effectiveness of Adding a Mask Recommendation to Other Public Health Measures to Prevent SARS-CoV-2 Infection in Danish Mask Wearers, Bundgaard, 2021	“Infection with SARS-CoV-2 occurred in 42 participants recommended masks (1.8%) and 53 control participants (2.1%). The between-group difference was −0.3 percentage point (95% CI, −1.2 to 0.4 percentage point; P = 0.38) (odds ratio, 0.82 [CI, 0.54 to 1.23]; P = 0.33). Multiple imputation accounting for loss to follow-up yielded similar results...the recommendation to wear surgical masks to supplement other public health measures did not reduce the SARS-CoV-2 infection rate among wearers by more than 50% in a community with modest infection rates, some degree of social distancing, and uncommon general mask use.”
2) SARS-CoV-2 Transmission among Marine Recruits during Quarantine, Letizia, 2020	“Our study showed that in a group of predominantly young male military recruits, approximately 2% became positive for SARS-CoV-2, as determined by qPCR assay, during a 2-week, strictly enforced quarantine. Multiple, independent virus strain transmission clusters were identified...all recruits wore double-layered cloth masks at all times indoors and outdoors.”
3) Physical interventions to interrupt or reduce the spread of respiratory viruses, Jefferson, 2020	“There is low certainty evidence from nine trials (3507 participants) that wearing a mask may make little or no difference to the outcome of influenza-like illness (ILI) compared to not wearing a mask (risk ratio (RR) 0.99, 95% confidence interval (CI) 0.82 to 1.18. There is moderate certainty evidence that wearing a mask probably makes little or no difference to the outcome of laboratory-confirmed influenza compared to not wearing a mask (RR 0.91, 95% CI 0.66 to 1.26; 6 trials; 3005 participants)...the pooled results of randomised trials did not show a clear reduction in respiratory viral infection with the use of medical/surgical masks during seasonal influenza.”
4) The Impact of Community Masking on COVID-19: A Cluster-Randomized Trial in Bangladesh, Abaluck, 2021 Heneghan et al.	A cluster-randomized trial of community-level mask promotion in rural Bangladesh from November 2020 to April 2021 (N=600 villages, N=342,126 adults. Heneghan writes: “In a Bangladesh study , surgical masks reduced symptomatic COVID infections by between 0 and 22 percent, while the efficacy of cloth masks led to somewhere between an 11 percent increase to a 21 percent decrease. Hence, based on these randomized studies, adult masks appear to have either no or limited efficacy.”

<p>5) Evidence for Community Cloth Face Masking to Limit the Spread of SARS-CoV-2: A Critical Review, Liu/CATO, 2021</p>	<p>“The available clinical evidence of facemask efficacy is of low quality and the best available clinical evidence has mostly failed to show efficacy, with fourteen of sixteen identified randomized controlled trials comparing face masks to no mask controls failing to find statistically significant benefit in the intent-to-treat populations. Of sixteen quantitative meta-analyses, eight were equivocal or critical as to whether evidence supports a public recommendation of masks, and the remaining eight supported a public mask intervention on limited evidence primarily on the basis of the precautionary principle.”</p>
<p>6) Nonpharmaceutical Measures for Pandemic Influenza in Nonhealthcare Settings—Personal Protective and Environmental Measures, CDC/Xiao, 2020</p>	<p>“Evidence from 14 randomized controlled trials of these measures did not support a substantial effect on transmission of laboratory-confirmed influenza...none of the household studies reported a significant reduction in secondary laboratory-confirmed influenza virus infections in the face mask group...the overall reduction in ILI or laboratory-confirmed influenza cases in the face mask group was not significant in either studies.”</p>
<p>7) CIDRAP: Masks-for-all for COVID-19 not based on sound data, Brosseau, 2020</p>	<p>“We agree that the data supporting the effectiveness of a cloth mask or face covering are very limited. We do, however, have data from laboratory studies that indicate cloth masks or face coverings offer very low filter collection efficiency for the smaller inhalable particles we believe are largely responsible for transmission, particularly from pre- or asymptomatic individuals who are not coughing or sneezing...though we support mask wearing by the general public, we continue to conclude that cloth masks and face coverings are likely to have limited impact on lowering COVID-19 transmission, because they have minimal ability to prevent the emission of small particles, offer limited personal protection with respect to small particle inhalation, and should not be recommended as a replacement for physical distancing or reducing time in enclosed spaces with many potentially infectious people.”</p>
<p>8) Universal Masking in Hospitals in the Covid-19 Era, Klompas/NEJM, 2020</p>	<p>“We know that wearing a mask outside health care facilities offers little, if any, protection from infection. Public health authorities define a significant exposure to Covid-19 as face-to-face contact within 6 feet with a patient with symptomatic Covid-19 that is sustained for at least a few minutes (and some say more than 10 minutes or even 30 minutes). The chance of catching Covid-19 from a passing interaction in a public space is therefore minimal. In many cases, the desire for widespread masking is a reflexive reaction to anxiety over the pandemic...The calculus may be different,</p>

	<p>however, in health care settings. First and foremost, a mask is a core component of the personal protective equipment (PPE) clinicians need when caring for symptomatic patients with respiratory viral infections, in conjunction with gown, gloves, and eye protection...universal masking alone is not a panacea. A mask will not protect providers caring for a patient with active Covid-19 if it's not accompanied by meticulous hand hygiene, eye protection, gloves, and a gown. A mask alone will not prevent health care workers with early Covid-19 from contaminating their hands and spreading the virus to patients and colleagues. Focusing on universal masking alone may, paradoxically, lead to more transmission of Covid-19 if it diverts attention from implementing more fundamental infection-control measures."</p>
<p>9) Masks for prevention of viral respiratory infections among health care workers and the public: PEER umbrella systematic review, Dugré, 2020</p>	<p>"This systematic review found limited evidence that the use of masks might reduce the risk of viral respiratory infections. In the community setting, a possible reduced risk of influenza-like illness was found among mask users. In health care workers, the results show no difference between N95 masks and surgical masks on the risk of confirmed influenza or other confirmed viral respiratory infections, although possible benefits from N95 masks were found for preventing influenza-like illness or other clinical respiratory infections. Surgical masks might be superior to cloth masks but data are limited to 1 trial."</p>
<p>10) Effectiveness of personal protective measures in reducing pandemic influenza transmission: A systematic review and meta-analysis, Saunders-Hastings, 2017</p>	<p>"Facemask use provided a non-significant protective effect (OR = 0.53; 95% CI 0.16–1.71; I^2 = 48%) against 2009 pandemic influenza infection."</p>
<p>11) Experimental investigation of indoor aerosol dispersion and accumulation in the context of COVID-19: Effects of masks and ventilation, Shah, 2021</p>	<p>"Nevertheless, high-efficiency masks, such as the KN95, still offer substantially higher apparent filtration efficiencies (60% and 46% for R95 and KN95 masks, respectively) than the more commonly used cloth (10%) and surgical masks (12%), and therefore are still the recommended choice in mitigating airborne disease transmission indoors."</p>
<p>12) Exercise with facemask; Are we handling a devil's sword?- A physiological hypothesis, Chandrasekaran, 2020</p>	<p>"Exercising with facemasks may reduce available Oxygen and increase air trapping preventing substantial carbon dioxide exchange. The hypercapnic hypoxia may potentially increase acidic environment, cardiac overload, anaerobic metabolism and renal overload, which may substantially aggravate the underlying pathology of established chronic diseases. Further contrary to the earlier thought, no evidence</p>

	exists to claim the facemasks during exercise offer additional protection from the droplet transfer of the virus.”
13) Surgical face masks in modern operating rooms–a costly and unnecessary ritual?, Mitchell, 1991	“Following the commissioning of a new suite of operating rooms air movement studies showed a flow of air away from the operating table towards the periphery of the room. Oral microbial flora dispersed by unmasked male and female volunteers standing one metre from the table failed to contaminate exposed settle plates placed on the table. The wearing of face masks by non-scrubbed staff working in an operating room with forced ventilation seems to be unnecessary.”
14) Facemask against viral respiratory infections among Hajj pilgrims: A challenging cluster-randomized trial, Alfelali, 2020	“By intention-to-treat analysis, facemask use did not seem to be effective against laboratory-confirmed viral respiratory infections (odds ratio [OR], 1.4; 95% confidence interval [CI], 0.9 to 2.1, $p = 0.18$) nor against clinical respiratory infection (OR, 1.1; 95% CI, 0.9 to 1.4, $p = 0.40$).”
15) Simple respiratory protection–evaluation of the filtration performance of cloth masks and common fabric materials against 20-1000 nm size particles, Rengasamy, 2010	“Results obtained in the study show that common fabric materials may provide marginal protection against nanoparticles including those in the size ranges of virus-containing particles in exhaled breath.”
16) Respiratory performance offered by N95 respirators and surgical masks: human subject evaluation with NaCl aerosol representing bacterial and viral particle size range, Lee, 2008	“The study indicates that N95 filtering facepiece respirators may not achieve the expected protection level against bacteria and viruses. An exhalation valve on the N95 respirator does not affect the respiratory protection; it appears to be an appropriate alternative to reduce the breathing resistance.”
17) Aerosol penetration and leakage characteristics of masks used in the health care industry, Weber, 1993	“We conclude that the protection provided by surgical masks may be insufficient in environments containing potentially hazardous sub-micrometer-sized aerosols.”
18) Disposable surgical face masks for preventing surgical wound infection in clean surgery, Vincent, 2016	“We included three trials, involving a total of 2106 participants. There was no statistically significant difference in infection rates between the masked and unmasked group in any of the trials...from the limited results it is unclear whether the wearing of surgical face masks by members of the surgical team has any impact on surgical wound infection rates for patients undergoing clean surgery.”
19) Disposable surgical face masks: a systematic review, Lipp, 2005	“From the limited results it is unclear whether wearing surgical face masks results in any harm or benefit to the patient undergoing clean surgery.”

20) Comparison of the Filter Efficiency of Medical Nonwoven Fabrics against Three Different Microbe Aerosols, Shimasaki, 2018	“We conclude that the filter efficiency test using the phi-X174 phage aerosol may overestimate the protective performance of nonwoven fabrics with filter structure compared to that against real pathogens such as the influenza virus.”
21) The use of masks and respirators to prevent transmission of influenza: a systematic review of the scientific evidence 21) The use of masks and respirators to prevent transmission of influenza: a systematic review of the scientific evidence, Bin-Reza, 2012	The use of masks and respirators to prevent transmission of influenza: a systematic review of the scientific evidence “None of the studies established a conclusive relationship between mask/respirator use and protection against influenza infection. Some evidence suggests that mask use is best undertaken as part of a package of personal protection especially hand hygiene.”
22) Facial protection for healthcare workers during pandemics: a scoping review, Godoy, 2020	“Compared with surgical masks, N95 respirators perform better in laboratory testing, may provide superior protection in inpatient settings and perform equivalently in outpatient settings. Surgical mask and N95 respirator conservation strategies include extended use, reuse or decontamination, but these strategies may result in inferior protection. Limited evidence suggests that reused and improvised masks should be used when medical-grade protection is unavailable.”
23) Assessment of Proficiency of N95 Mask Donning Among the General Public in Singapore, Yeung, 2020	“These findings support ongoing recommendations against the use of N95 masks by the general public during the COVID-19 pandemic. ⁵ N95 mask use by the general public may not translate into effective protection but instead provide false reassurance. Beyond N95 masks, proficiency among the general public in donning surgical masks needs to be assessed.”
24) Evaluating the efficacy of cloth facemasks in reducing particulate matter exposure, Shakya, 2017	“Standard N95 mask performance was used as a control to compare the results with cloth masks, and our results suggest that cloth masks are only marginally beneficial in protecting individuals from particles <2.5 µm.”
25) Use of surgical face masks to reduce the incidence of the common cold among health care workers in Japan: a randomized controlled trial, Jacobs, 2009	“Face mask use in health care workers has not been demonstrated to provide benefit in terms of cold symptoms or getting colds.”
26) N95 Respirators vs Medical Masks for Preventing Influenza Among Health Care Personnel, Radonovich, 2019	“Among outpatient health care personnel, N95 respirators vs medical masks as worn by participants in this trial resulted in no significant difference in the incidence of laboratory-confirmed influenza.”

27) Does Universal Mask Wearing Decrease or Increase the Spread of COVID-19?, Watts up with that? 2020	“A survey of peer-reviewed studies shows that universal mask wearing (as opposed to wearing masks in specific settings) does not decrease the transmission of respiratory viruses from people wearing masks to people who are not wearing masks.”
28) Masking: A Careful Review of the Evidence, Alexander, 2021	“In fact, it is not unreasonable at this time to conclude that surgical and cloth masks, used as they currently are, have absolutely no impact on controlling the transmission of Covid-19 virus, and current evidence implies that face masks can be actually harmful.”
29) Community and Close Contact Exposures Associated with COVID-19 Among Symptomatic Adults ≥18 Years in 11 Outpatient Health Care Facilities — United States, July 2020, Fisher, 2020	Reported characteristics of symptomatic adults ≥18 years who were outpatients in 11 US academic health care facilities and who received positive and negative SARS-CoV-2 test results (N = 314)* — United States, July 1–29, 2020, revealed that 80% of infected persons wore face masks almost all or most of the time .
30) Impact of non-pharmaceutical interventions against COVID-19 in Europe: a quasi-experimental study, Hunter, 2020	Face masks in public was not associated with reduced incidence.
31) Masking lack of evidence with politics, CEBM, Heneghan, 2020	“It would appear that despite two decades of pandemic preparedness, there is considerable uncertainty as to the value of wearing masks. For instance, high rates of infection with cloth masks could be due to harms caused by cloth masks, or benefits of medical masks. The numerous systematic reviews that have been recently published all include the same evidence base so unsurprisingly broadly reach the same conclusions.”
32) Transmission of COVID-19 in 282 clusters in Catalonia, Spain: a cohort study, Marks, 2021	“We observed no association of risk of transmission with reported mask usage by contacts, with the age or sex of the index case, or with the presence of respiratory symptoms in the index case at the initial study visit.”
33) Non-pharmaceutical public health measures for mitigating the risk and impact of epidemic and pandemic influenza, WHO, 2020	“Ten RCTs were included in the meta-analysis, and there was no evidence that face masks are effective in reducing transmission of laboratory-confirmed influenza.”
34) The Strangely Unscientific Masking of America, Younes, 2020	“One report reached its conclusion based on observations of a “ dummy head attached to a breathing simulator .” Another analyzed use of surgical masks on people experiencing at least two symptoms of acute respiratory illness. Incidentally, not one

	<p>of these studies involved cloth masks or accounted for real-world mask usage (or misuse) among lay people, and none established efficacy of widespread mask-wearing by people not exhibiting symptoms. There was simply no evidence whatsoever that healthy people ought to wear masks when going about their lives, especially outdoors.”</p>
<p>35) Facemasks and similar barriers to prevent respiratory illness such as COVID-19: A rapid systematic review, Brainard, 2020</p>	<p>“31 eligible studies (including 12 RCTs). Narrative synthesis and random-effects meta-analysis of attack rates for primary and secondary prevention in 28 studies were performed. Based on the RCTs we would conclude that wearing facemasks can be very slightly protective against primary infection from casual community contact, and modestly protective against household infections when both infected and uninfected members wear facemasks. However, the RCTs often suffered from poor compliance and controls using facemasks.”</p>
<p>36) The Year of Disguises, Koops, 2020</p>	<p>“The healthy people in our society should not be punished for being healthy, which is exactly what lockdowns, distancing, mask mandates, etc. do...Children should not be wearing face coverings. We all need constant interaction with our environments and that is especially true for children. This is how their immune system develops. They are the lowest of the low-risk groups. Let them be kids and let them develop their immune systems... The “Mask Mandate” idea is a truly ridiculous, knee-jerk reaction and needs to be withdrawn and thrown in the waste bin of disastrous policy, along with lockdowns and school closures. You can vote for a person without blindly supporting all of their proposals!”</p>
<p>37) Open Schools, Covid-19, and Child and Teacher Morbidity in Sweden, Ludvigsson, 2020</p>	<p>“1,951,905 children in Sweden (as of December 31, 2019) who were 1 to 16 years of age, were examined...social distancing was encouraged in Sweden, but wearing face masks was not...No child with Covid-19 died.”</p>
<p>38) Double-Masking Benefits Are Limited, Japan Supercomputer Finds, Reidy, 2021</p>	<p>“Wearing two masks offers limited benefits in preventing the spread of droplets that could carry the coronavirus compared to one well-fitted disposable mask, according to a Japanese study that modeled the dispersal of droplets on a supercomputer.”</p>
<p>39) Physical interventions to interrupt or reduce the spread of respiratory viruses. Part 1 – Face masks, eye</p>	<p>“There was insufficient evidence to provide a recommendation on the use of facial barriers without other measures. We found insufficient evidence for a difference</p>

protection and person distancing: systematic review and meta-analysis, Jefferson, 2020	between surgical masks and N95 respirators and limited evidence to support effectiveness of quarantine.”
40) Should individuals in the community without respiratory symptoms wear facemasks to reduce the spread of COVID-19?, NIPH, 2020	“Non-medical facemasks include a variety of products. There is no reliable evidence of the effectiveness of non-medical facemasks in community settings. There is likely to be substantial variation in effectiveness between products. However, there is only limited evidence from laboratory studies of potential differences in effectiveness when different products are used in the community.”
41) Is a mask necessary in the operating theatre?, Orr, 1981	“It would appear that minimum contamination can best be achieved by not wearing a mask at all but operating in silence. Whatever its relation to contamination, bacterial counts, or the dissemination of squames, there is no direct evidence that the wearing of masks reduces wound infection.”
42) The surgical mask is a bad fit for risk reduction, Neilson, 2016	“As recently as 2010, the US National Academy of Sciences declared that, in the community setting, “face masks are not designed or certified to protect the wearer from exposure to respiratory hazards.” A number of studies have shown the inefficacy of the surgical mask in household settings to prevent transmission of the influenza virus.”
43) Facemask versus No Facemask in Preventing Viral Respiratory Infections During Hajj: A Cluster Randomised Open Label Trial, Alfelali, 2019	“Facemask use does not prevent clinical or laboratory-confirmed viral respiratory infections among Hajj pilgrims.”
44) Facemasks in the COVID-19 era: A health hypothesis, Vainshelboim, 2021	“The existing scientific evidences challenge the safety and efficacy of wearing facemask as preventive intervention for COVID-19. The data suggest that both medical and non-medical facemasks are ineffective to block human-to-human transmission of viral and infectious disease such SARS-CoV-2 and COVID-19, supporting against the usage of facemasks. Wearing facemasks has been demonstrated to have substantial adverse physiological and psychological effects. These include hypoxia, hypercapnia, shortness of breath, increased acidity and toxicity, activation of fear and stress response, rise in stress hormones, immunosuppression, fatigue, headaches, decline in cognitive performance, predisposition for viral and infectious illnesses, chronic stress, anxiety and depression.”

45) The use of masks and respirators to prevent transmission of influenza: a systematic review of the scientific evidence, Bin-Reza, 2011	“None of the studies established a conclusive relationship between mask/respirator use and protection against influenza infection. Some evidence suggests that mask use is best undertaken as part of a package of personal protection especially hand hygiene.”
46) Are Face Masks Effective? The Evidence., Swiss Policy Research, 2021	“Most studies found little to no evidence for the effectiveness of face masks in the general population, neither as personal protective equipment nor as a source control.”
47) Postoperative wound infections and surgical face masks: A controlled study, Tunevall, 1991	“These results indicate that the use of face masks might be reconsidered. Masks may be used to protect the operating team from drops of infected blood and from airborne infections, but have not been proven to protect the patient operated by a healthy operating team.”
48) Mask mandate and use efficacy in state-level COVID-19 containment, Guerra, 2021	“Mask mandates and use are not associated with slower state-level COVID-19 spread during COVID-19 growth surges.”
49) Twenty Reasons Mandatory Face Masks are Unsafe, Ineffective and Immoral, Manley, 2021	“A CDC-funded review on masking in May 2020 came to the conclusion: “Although mechanistic studies support the potential effect of hand hygiene or face masks, evidence from 14 randomized controlled trials of these measures did not support a substantial effect on transmission of laboratory-confirmed influenza... None of the household studies reported a significant reduction in secondary laboratory-confirmed influenza virus infections in the face mask group.” If masks can’t stop the regular flu, how can they stop SAR-CoV-2?”
50) A cluster randomised trial of cloth masks compared with medical masks in healthcare workers, MacIntyre, 2015	“First RCT of cloth masks, and the results caution against the use of cloth masks. This is an important finding to inform occupational health and safety. Moisture retention, reuse of cloth masks and poor filtration may result in increased risk of infection...the rates of all infection outcomes were highest in the cloth mask arm, with the rate of ILI statistically significantly higher in the cloth mask arm (relative risk (RR)=13.00, 95% CI 1.69 to 100.07) compared with the medical mask arm. Cloth masks also had significantly higher rates of ILI compared with the control arm. An analysis by mask use showed ILI (RR=6.64, 95% CI 1.45 to 28.65) and laboratory-confirmed virus (RR=1.72, 95% CI 1.01 to 2.94) were significantly higher in the cloth masks group compared with the medical masks group. Penetration of cloth masks by particles was almost 97% and medical masks 44%.”

51) Horowitz: Data from India continues to blow up the 'Delta' fear narrative, Blazemedia, 2021	"Rather than proving the need to sow more panic, fear, and control over people, the story from India — the source of the "Delta" variant — continues to refute every current premise of COVID fascism...Masks failed to stop the spread there."
52) An outbreak caused by the SARS-CoV-2 Delta variant (B.1.617.2) in a secondary care hospital in Finland, May 2021, Hetemäki, 2021	Reporting on a nosocomial hospital outbreak in Finland, Hetemäli et al. observed that "both symptomatic and asymptomatic infections were found among vaccinated health care workers, and secondary transmission occurred from those with symptomatic infections despite use of personal protective equipment."
53) Nosocomial outbreak caused by the SARS-CoV-2 Delta variant in a highly vaccinated population, Israel, July 2021, Shitrit, 2021	In a hospital outbreak investigation in Israel, Shitrit et al. observed "high transmissibility of the SARS-CoV-2 Delta variant among twice vaccinated and masked individuals." They added that "this suggests some waning of immunity, albeit still providing protection for individuals without comorbidities." Again, despite use of personal protective equipment.
54) 47 studies confirm ineffectiveness of masks for COVID and 32 more confirm their negative health effects, Lifesite news staff, 2021	"No studies were needed to justify this practice since most understood viruses were far too small to be stopped by the wearing of most masks, other than sophisticated ones designed for that task and which were too costly and complicated for the general public to properly wear and keep changing or cleaning. It was also understood that long mask wearing was unhealthy for wearers for common sense and basic science reasons."
55) Are EUA Face Masks Effective in Slowing the Spread of a Viral Infection?, Dopp, 2021	The vast evidence shows that masks are ineffective.
56) CDC Study finds overwhelming majority of people getting coronavirus wore masks, Boyd/Federalist, 2021	"A Centers for Disease Control report released in September shows that masks and face coverings are not effective in preventing the spread of COVID-19, even for those people who consistently wear them."
57) Most Mask Studies Are Garbage, Eugyppius, 2021	"The other kind of study, the proper kind, would be a randomised controlled trial. You compare the rates of infection in a masked cohort against rates of infection in an unmasked cohort. Here things have gone much, much worse for mask brigade. They spent months trying to prevent the publication of the Danish randomised controlled trial , which found that masks do zero. When that paper finally squeaked into print, they spent more months trying desperately to poke holes in it. You could feel their boundless relief when the Bangladesh study finally appeared to save them in early

	<p>September. Every last Twitter blue-check could now proclaim that Science Shows Masks Work. Such was their hunger for any scrap of evidence to prop up their prior convictions, that none of them noticed the sad nature of the Science in question. The study found a mere 10% reduction in seroprevalence among the masked cohort, an effect so small that it fell within the confidence interval. Even the study authors couldn't exclude the possibility that masks in fact do zero."</p>
<p>58) Using face masks in the community: first update, ECDC, 2021</p>	<p>"No high-quality evidence in favor of face masks and recommended their use only based on the 'precautionary principle."</p>
<p>59) Do physical measures such as hand-washing or wearing masks stop or slow down the spread of respiratory viruses?, Cochrane, 2020</p>	<p>"Seven studies took place in the community, and two studies in healthcare workers. Compared with wearing no mask, wearing a mask may make little to no difference in how many people caught a flu-like illness (9 studies; 3507 people); and probably makes no difference in how many people have flu confirmed by a laboratory test (6 studies; 3005 people). Unwanted effects were rarely reported, but included discomfort."</p>
<p>60) Mouth-nose protection in public: No evidence of effectiveness, Thieme/ Kappstein, 2020</p>	<p>"The use of masks in public spaces is questionable simply because of the lack of scientific data. If one also considers the necessary precautions, masks must even be considered a risk of infection in public spaces according to the rules known from hospitals... If masks are worn by the population, the risk of infection is potentially increased, regardless of whether they are medical masks or whether they are so-called community masks designed in any way. If one considers the precautionary measures that the RKI as well as the international health authorities have pronounced, all authorities would even have to inform the population that masks should not be worn in public spaces at all. Because no matter whether it is a duty for all citizens or voluntarily borne by the citizens who want it for whatever reason, it remains a fact that masks can do more harm than good in public."</p>
<p>61) US mask guidance for kids is the strictest across the world, Skelding, 2021</p>	<p>"Kids need to see faces," Jay Bhattacharya, a professor of medicine at Stanford University, told The Post. Youngsters watch people's mouths to learn to speak, read and understand emotions, he said. "We have this idea that this disease is so bad that we must adopt any means necessary to stop it from spreading," he said. "It's not that masks in schools have no costs. They actually do have substantial costs."</p>

62) Masking young children in school harms language acquisition, Walsh, 2021	“This is important because children and/or students do not have the speech or language ability that adults have — they are not equally able and the ability to see the face and especially the mouth is critical to language acquisition which children and/or students are engaged in at all times. Furthermore, the ability to see the mouth is not only essential to communication but also essential to brain development.”
63) The Case Against Masks for Children, Makary, 2021	“It’s abusive to force kids who struggle with them to sacrifice for the sake of unvaccinated adults... Do masks reduce Covid transmission in children? Believe it or not, we could find only a single retrospective study on the question, and its results were inconclusive. Yet two weeks ago the Centers for Disease Control and Prevention sternly decreed that 56 million U.S. children and adolescents, vaccinated or not, should cover their faces regardless of the prevalence of infection in their community. Authorities in many places took the cue to impose mandates in schools and elsewhere, on the theory that masks can’t do any harm. That isn’t true. Some children are fine wearing a mask, but others struggle. Those who have myopia can have difficulty seeing because the mask fogs their glasses. (This has long been a problem for medical students in the operating room.) Masks can cause severe acne and other skin problems. The discomfort of a mask distracts some children from learning. By increasing airway resistance during exhalation, masks can lead to increased levels of carbon dioxide in the blood. And masks can be vectors for pathogens if they become moist or are used for too long.”
64) Face Covering Mandates, Peavey, 2021	“Face Covering Mandates And Why They AREN’T Effective.”
65) Do masks work? A Review of the evidence, Anderson, 2021	“In truth, the CDC’s, U.K.’s, and WHO’s earlier guidance was much more consistent with the best medical research on masks’ effectiveness in preventing the spread of viruses. That research suggests that Americans’ many months of mask-wearing has likely provided little to no health benefit and might even have been counterproductive in preventing the spread of the novel coronavirus.”
66) Most face masks won’t stop COVID-19 indoors, study warns, Anderer, 2021	“New research reveals that cloth masks filter just 10% of exhaled aerosols, with many people not wearing coverings that fit their face properly.”
67) How face masks and lockdowns failed/the face mask folly in retrospect, Swiss Policy Research, 2021	“Mask mandates and lockdowns have had no discernible impact.”

<p>68) CDC Releases School COVID Transmission Study But Buries One of the Most Damning Parts, Davis, 2021</p>	<p>“The 21% lower incidence in schools that required mask use among students was not statistically significant compared with schools where mask use was optional... With tens of millions of American kids headed back to school in the fall, their parents and political leaders owe it to them to have a clear-sighted, scientifically rigorous discussion about which anti-COVID measures actually work and which might put an extra burden on vulnerable young people without meaningfully or demonstrably slowing the spread of the virus...that a masking requirement of students failed to show independent benefit is a finding of consequence and great interest.”</p>
<p>69) World Health Organization internal meeting, COVID-19 – virtual press conference – 30 March 2020, 2020</p>	<p>“This is a question on Austria. The Austrian Government has a desire to make everyone wear a mask who’s going into the shops. I understood from our previous briefings with you that the general public should not wear masks because they are in short supply. What do you say about the new Austrian measures?... I’m not specifically aware of that measure in Austria. I would assume that it’s aimed at people who potentially have the disease not passing it to others. In general WHO recommends that the wearing of a mask by a member of the public is to prevent that individual giving the disease to somebody else. We don’t generally recommend the wearing to masks in public by otherwise well individuals because it has not been up to now associated with any particular benefit.”</p>
<p>70) Face masks to prevent transmission of influenza virus: a systematic review, Cowling, 2010</p>	<p>“Review highlights the limited evidence base supporting the efficacy or effectiveness of face masks to reduce influenza virus transmission.”“None of the studies reviewed showed a benefit from wearing a mask, in either HCW or community members in households (H).”</p>
<p>71) Effectiveness of N95 respirators versus surgical masks in protecting health care workers from acute respiratory infection: a systematic review and meta-analysis, Smith, 2016</p>	<p>“Although N95 respirators appeared to have a protective advantage over surgical masks in laboratory settings, our meta-analysis showed that there were insufficient data to determine definitively whether N95 respirators are superior to surgical masks in protecting health care workers against transmissible acute respiratory infections in clinical settings.”</p>
<p>72) Effectiveness of Masks and Respirators Against Respiratory Infections in Healthcare Workers: A Systematic Review and Meta-Analysis, Offeddu, 2017</p>	<p>“We found evidence to support universal medical mask use in hospital settings as part of infection control measures to reduce the risk of CRI and ILI among HCWs. Overall, N95 respirators may convey greater protection, but universal use throughout a work shift is likely to be less acceptable due to greater discomfort...Our analysis confirms</p>

	<p>the effectiveness of medical masks and respirators against SARS. Disposable, cotton, or paper masks are not recommended. The confirmed effectiveness of medical masks is crucially important for lower-resource and emergency settings lacking access to N95 respirators. In such cases, single-use medical masks are preferable to cloth masks, for which there is no evidence of protection and which might facilitate transmission of pathogens when used repeatedly without adequate sterilization...We found no clear benefit of either medical masks or N95 respirators against pH1N1...Overall, the evidence to inform policies on mask use in HCWs is poor, with a small number of studies that is prone to reporting biases and lack of statistical power.”</p>
<p>73) N95 Respirators vs Medical Masks for Preventing Influenza Among Health Care Personnel, Radonovich, 2019</p>	<p>“Use of N95 respirators, compared with medical masks, in the outpatient setting resulted in no significant difference in the rates of laboratory-confirmed influenza.”</p>
<p>Effectiveness of N95 respirators versus surgical masks against influenza: A systematic review and meta-analysis⁷⁴⁾ Masks Don’t Work: A Review of Science Relevant to COVID-19 Social Policy, Rancourt, 2020</p>	<p>The use of N95 respirators compared with surgical masks is not associated with a lower risk of laboratory-confirmed influenza. It suggests that N95 respirators should not be recommended for general public and nonhigh-risk medical staff those are not in close contact with influenza patients or suspected patients. “No RCT study with verified outcome shows a benefit for HCW or community members in households to wearing a mask or respirator. There is no such study. There are no exceptions. Likewise, no study exists that shows a benefit from a broad policy to wear masks in public (more on this below). Furthermore, if there were any benefit to wearing a mask, because of the blocking power against droplets and aerosol particles, then there should be more benefit from wearing a respirator (N95) compared to a surgical mask, yet several large meta-analyses, and all the RCT, prove that there is no such relative benefit.”</p>
<p>75) More Than a Dozen Credible Medical Studies Prove Face Masks Do Not Work Even In Hospitals!, Firstenberg, 2020</p>	<p>“Mandating masks has not kept death rates down anywhere. The 20 U.S. states that have never ordered people to wear face masks indoors and out have dramatically lower COVID-19 death rates than the 30 states that have mandated masks. Most of the no-mask states have COVID-19 death rates below 20 per 100,000 population, and none have a death rate higher than 55. All 13 states that have death rates higher 55 are states that have required the wearing of masks in all public places. It has not protected them.”</p>

76) Does evidence based medicine support the effectiveness of surgical facemasks in preventing postoperative wound infections in elective surgery?, Bahli, 2009	“From the limited randomized trials it is still not clear that whether wearing surgical face masks harms or benefit the patients undergoing elective surgery.”
77) Peritonitis prevention in CAPD: to mask or not?, Figueiredo, 2000	“The current study suggests that routine use of face masks during CAPD bag exchanges may be unnecessary and could be discontinued.”
78) The operating room environment as affected by people and the surgical face mask, Ritter, 1975	“The wearing of a surgical face mask had no effect upon the overall operating room environmental contamination and probably work only to redirect the projectile effect of talking and breathing. People are the major source of environmental contamination in the operating room.”
79) The efficacy of standard surgical face masks: an investigation using “tracer particles, Ha’eri, 1980	“Particle contamination of the wound was demonstrated in all experiments. Since the microspheres were not identified on the exterior of these face masks, they must have escaped around the mask edges and found their way into the wound.”
80) Wearing of caps and masks not necessary during cardiac catheterization, Laslett, 1989	“Prospectively evaluated the experience of 504 patients undergoing percutaneous left heart catheterization, seeking evidence of a relationship between whether caps and/or masks were worn by the operators and the incidence of infection. No infections were found in any patient, regardless of whether a cap or mask was used. Thus, we found no evidence that caps or masks need to be worn during percutaneous cardiac catheterization.”
81) Do anaesthetists need to wear surgical masks in the operating theatre? A literature review with evidence-based recommendations, Skinner, 2001	“A questionnaire-based survey, undertaken by Leyland’ in 1993 to assess attitudes to the use of masks, showed that 20% of surgeons discarded surgical masks for endoscopic work. Less than 50% did not wear the mask as recommended by the Medical Research Council. Equal numbers of surgeons wore the mask in the belief they were protecting themselves and the patient, with 20% of these admitting that tradition was the only reason for wearing them.”
82) Mask mandates for children are not backed by data, Faria, 2021	“Even if you want to use the 2018-19 flu season to avoid overlap with the start of the COVID-19 pandemic, the CDC paints a similar picture: It estimated 480 flu deaths among children during that period, with 46,000 hospitalizations. COVID-19, mercifully, is simply not as deadly for children. According to the American Academy of Pediatrics, preliminary data from 45 states show that between 0.00%-0.03% of child COVID-19

	<p>cases resulted in death. When you combine these numbers with the CDC study that found mask mandates for students — along with hybrid models, social distancing, and classroom barriers — did not have a statistically significant benefit in preventing the spread of COVID-19 in schools, the insistence that we force students to jump through these hoops for their own protection makes no sense.”</p>
<p>83) The Downsides of Masking Young Students Are Real, Prasad, 2021</p>	<p>“The benefits of mask requirements in schools might seem self-evident—they have to help contain the coronavirus, right?—but that may not be so. In Spain, masks are used in kids ages 6 and older. The authors of one study there examined the risk of viral spread at all ages. If masks provided a large benefit, then the transmission rate among 5-year-olds would be far higher than the rate among 6-year-olds. The results don’t show that. Instead, they show that transmission rates, which were low among the youngest kids, steadily increased with age—rather than dropping sharply for older children subject to the face-covering requirement. This suggests that masking kids in school does not provide a major benefit and might provide none at all. And yet many officials prefer to double down on masking mandates, as if the fundamental policy were sound and only the people have failed.”</p>
<p>84) Masks In Schools: Scientific American Fumbles Report On Childhood COVID Transmission, English/ACSH, 2021</p>	<p>“Masking is a low-risk, inexpensive intervention. If we want to recommend it as a precautionary measure, especially in situations where vaccination isn’t an option, great. But that’s not what the public has been told. “Florida governor Ron DeSantis and politicians in Texas say research does not support mask mandates,” SciAm’s sub-headline bellowed. “Many studies show they are wrong.” If that’s the case, demonstrate that the intervention works before you mandate its use in schools. If you can’t, acknowledged what UC San Francisco hematologist-oncologist and Associate Professor of Epidemiology Vinay Prasad wrote over at the Atlantic: “No scientific consensus exists about the wisdom of mandatory-masking rules for schoolchildren ... In mid-March 2020, few could argue against erring on the side of caution. But nearly 18 months later, we owe it to children and their parents to answer the question properly: Do the benefits of masking kids in school outweigh the downsides? The honest answer in 2021 remains that we don’t know for sure.”</p>
<p>85) Masks ‘don’t work,’ are damaging health and are being used to control population: Doctors panel, Haynes, 2021</p>	<p>“The only randomized control studies that have ever been done on masks show that they don’t work,” began Dr. Nepute. He referred to Dr. Anthony Fauci’s “noble lie,” in which Fauci “changed his tune,” from his March 2020 comments, where he</p>

	<p>downplayed the need and efficacy of mask wearing, before urging Americans to use masks later in the year. “Well, he lied to us. So if he lied about that, what else has he lied to you about?” questioned Nepute. Masks have become commonplace in almost every setting, whether indoors or outdoors, but Dr. Popper mentioned how there have been “no studies” which actually examine the “effect of wearing a mask during all your waking hours.” “There’s no science to back any of this and particularly no science to back the fact that wearing a mask twenty four-seven or every waking minute, is health promoting,” added Popper.”</p>
86) Aerosol penetration through surgical masks, Chen, 1992	<p>“The mask that has the highest collection efficiency is not necessarily the best mask from the perspective of the filter-quality factor, which considers not only the capture efficiency but also the air resistance. Although surgical mask media may be adequate to remove bacteria exhaled or expelled by health care workers, they may not be sufficient to remove the sub-micrometer-sized aerosols containing pathogens to which these health care workers are potentially exposed.”</p>
87) CDC: Schools With Mask Mandates Didn’t See Statistically Significant Different Rates of COVID Transmission From Schools With Optional Policies, Miltimore, 2021	<p>“The CDC did not include its finding that “required mask use among students was not statistically significant compared with schools where mask use was optional” in the summary of its report.”</p>
88) Horowitz: Data from India continues to blow up the ‘Delta’ fear narrative, Howorwitz, 2021	<p>“Rather than proving the need to sow more panic, fear, and control over people, the story from India — the source of the “Delta” variant — continues to refute every current premise of COVID fascism... Unless we do that, we must return to the very effective lockdowns and masks. In reality, India’s experience proves the opposite true; namely: 1) Delta is largely an attenuated version, with a much lower fatality rate, that for most people is akin to a cold. 2) Masks failed to stop the spread there. 3) The country has come close to the herd immunity threshold with just 3% vaccinated.</p>
89) Transmission of SARS-CoV-2 Delta Variant Among Vaccinated Healthcare Workers, Vietnam, Chau, 2021	<p>While not definitive in the LANCET publication, it can be inferred that the nurses were all masked up and had PPE etc. as was the case in Finland and Israel nosocomial outbreaks, indicating the failure of PPE and masks to constrain Delta spread.</p>
90) Aerosol penetration through surgical masks, Willeke, 1992	<p>“The mask that has the highest collection efficiency is not necessarily the best mask from the perspective of the filter-quality factor, which considers not only the capture</p>

	<p>efficiency but also the air resistance. Although surgical mask media may be adequate to remove bacteria exhaled or expelled by health care workers, they may not be sufficient to remove the submicrometer-size aerosols containing pathogens to which these health care workers are potentially exposed.”</p>
<p>91) The efficacy of standard surgical face masks: an investigation using “tracer particles”, Wiley, 1980</p>	<p>“Particle contamination of the wound was demonstrated in all experiments. Since the microspheres were not identified on the exterior of these face masks, they must have escaped around the mask edges and found their way into the wound. The wearing of the mask beneath the headgear curtails this route of contamination.”</p>
<p>92) An Evidence Based Scientific Analysis of Why Masks are Ineffective, Unnecessary, and Harmful, Meehan, 2020</p>	<p>“Decades of the highest-level scientific evidence (meta-analyses of multiple randomized controlled trials) overwhelmingly conclude that medical masks are ineffective at preventing the transmission of respiratory viruses, including SAR-CoV-2...those arguing for masks are relying on low-level evidence (observational retrospective trials and mechanistic theories), none of which are powered to counter the evidence, arguments, and risks of mask mandates.”</p>
<p>93) Open Letter from Medical Doctors and Health Professionals to All Belgian Authorities and All Belgian Media, AIER, 2020</p>	<p>“Oral masks in healthy individuals are ineffective against the spread of viral infections.”</p>
<p>94) Effectiveness of N95 respirators versus surgical masks against influenza: A systematic review and meta-analysis, Long, 2020</p>	<p>“The use of N95 respirators compared with surgical masks is not associated with a lower risk of laboratory-confirmed influenza. It suggests that N95 respirators should not be recommended for general public and nonhigh-risk medical staff those are not in close contact with influenza patients or suspected patients.”</p>
<p>95) Advice on the use of masks in the context of COVID-19, WHO, 2020</p>	<p>“However, the use of a mask alone is insufficient to provide an adequate level of protection or source control, and other personal and community level measures should also be adopted to suppress transmission of respiratory viruses.”</p>
<p>96) Farce mask: it’s safe for only 20 minutes, The Sydney Morning Herald, 2003</p>	<p>“Health authorities have warned that surgical masks may not be an effective protection against the virus.”Those masks are only effective so long as they are dry,” said Professor Yvonne Cossart of the Department of Infectious Diseases at the University of Sydney.”As soon as they become saturated with the moisture in your breath they stop doing their job and pass on the droplets.”Professor Cossart said that could take as little as 15 or 20 minutes, after which the mask would need to be</p>

	<p>changed. But those warnings haven't stopped people snapping up the masks, with retailers reporting they are having trouble keeping up with demand."</p>
<p>97) Study: Wearing A Used Mask Is Potentially Riskier Than No Mask At All, Boyd, 2020</p> <p>Effects of mask-wearing on the inhalability and deposition of airborne SARS-CoV-2 aerosols in human upper airway</p>	<p>"According to researchers from the University of Massachusetts Lowell and California Baptist University, a three-layer surgical mask is 65 percent efficient in filtering particles in the air. That effectiveness, however, falls to 25 percent once it is used. "It is natural to think that wearing a mask, no matter new or old, should always be better than nothing," said author Jinxiang Xi. "Our results show that this belief is only true for particles larger than 5 micrometers, but not for fine particles smaller than 2.5 micrometers," he continued."</p>
MASK MANDATES	
<p>1) Mask mandate and use efficacy for COVID-19 containment in US States, Guerra, 2021</p>	<p>"Calculated total COVID-19 case growth and mask use for the continental United States with data from the Centers for Disease Control and Prevention and Institute for Health Metrics and Evaluation. We estimated post-mask mandate case growth in non-mandate states using median issuance dates of neighboring states with mandates...did not observe association between mask mandates or use and reduced COVID-19 spread in US states."</p>
<p>2) These 12 Graphs Show Mask Mandates Do Nothing To Stop COVID, Weiss, 2020</p>	<p>"Masks can work well when they're fully sealed, properly fitted, changed often, and have a filter designed for virus-sized particles. This represents none of the common masks available on the consumer market, making universal masking much more of a confidence trick than a medical solution...Our universal use of unscientific face coverings is therefore closer to medieval superstition than it is to science, but many powerful institutions have too much political capital invested in the mask narrative at this point, so the dogma is perpetuated. The narrative says that if cases go down it's because masks succeeded. It says that if cases go up it's because masks succeeded in preventing more cases. The narrative simply assumes rather than proves that masks work, despite overwhelming scientific evidence to the contrary."</p>
<p>3) Mask Mandates Seem to Make CCP Virus Infection Rates Climb, Study Says, Vadum, 2020</p>	<p>"Protective-mask mandates aimed at combating the spread of the CCP virus that causes the disease COVID-19 appear to promote its spread, according to a report from RationalGround.com, a clearinghouse of COVID-19 data trends that's run by a grassroots group of data analysts, computer scientists, and actuaries."</p>

<p>4) Horowitz: Comprehensive analysis of 50 states shows greater spread with mask mandates, Howorwitz, 2020 Justin Hart</p>	<p>“How long do our politicians get to ignore the results?... The results: When comparing states with mandates vs. those without, or periods of times within a state with a mandate vs. without, there is absolutely no evidence the mask mandate worked to slow the spread one iota. In total, in the states that had a mandate in effect, there were 9,605,256 confirmed COVID cases over 5,907 total days, an average of 27 cases per 100,000 per day. When states did not have a statewide order (which includes the states that never had them and the period of time masking states did not have the mandate in place) there were 5,781,716 cases over 5,772 total days, averaging 17 cases per 100,000 people per day.”</p>
<p>5) The CDC’s Mask Mandate Study: Debunked, Alexander, 2021</p>	<p>“Thus, it is not surprising that the CDC’s own recent conclusion on the use of nonpharmaceutical measures such as face masks in pandemic influenza, warned that scientific “evidence from 14 randomized controlled trials of these measures did not support a substantial effect on transmission...” Moreover, in the WHO’s 2019 guidance document on nonpharmaceutical public health measures in a pandemic, they reported as to face masks that “there is no evidence that this is effective in reducing transmission...” Similarly, in the fine print to a recent double-blind, double-masking simulation the CDC stated that “The findings of these simulations [supporting mask usage] should neither be generalized to the effectiveness ...nor interpreted as being representative of the effectiveness of these masks when worn in real-world settings.”</p>
<p>6) Phil Kerpin, tweet, 2021 The Spectator</p>	<p>“The first ecological study of state mask mandates and use to include winter data: “Case growth was independent of mandates at low and high rates of community spread, and mask use did not predict case growth during the Summer or Fall-Winter waves.”</p>
<p>7) How face masks and lockdowns failed, SPR, 2021</p>	<p>“Infections have been driven primarily by seasonal and endemic factors, whereas mask mandates and lockdowns have had no discernible impact”</p>
<p>8) Analysis of the Effects of COVID-19 Mask Mandates on Hospital Resource Consumption and Mortality at the County Level, Schauer, 2021</p>	<p>“There was no reduction in per-population daily mortality, hospital bed, ICU bed, or ventilator occupancy of COVID-19-positive patients attributable to the implementation of a mask-wearing mandate.”</p>

9) Do we need mask mandates, Harris, 2021	<p>“But masks proved far less useful in the subsequent 1918 Spanish flu, a viral disease spread by pathogens smaller than bacteria. California’s Department of Health, for instance, reported that the cities of Stockton, which required masks, and Boston, which did not, had scarcely different death rates, and so advised against mask mandates except for a few high-risk professions such as barbers....Randomized controlled trials (RCTs) on mask use, generally more reliable than observational studies, though not infallible, typically show that cloth and surgical masks offer little protection. A few RCTs suggest that perfect adherence to an exacting mask protocol may guard against influenza, but meta-analyses find little on the whole to suggest that masks offer meaningful protection. WHO guidelines from 2019 on influenza say that despite “mechanistic plausibility for the potential effectiveness” of masks, studies showed a benefit too small to be established with any certainty. Another literature review by researchers from the University of Hong Kong agrees. Its best estimate for the protective effect of surgical masks against influenza, based on ten RCTs published through 2018, was just 22 percent, and it could not rule out zero effect.”</p>
MASK HARMS	
1) Corona children studies: Co-Ki: First results of a German-wide registry on mouth and nose covering (mask) in children, Schwarz, 2021	<p>“The average wearing time of the mask was 270 minutes per day. Impairments caused by wearing the mask were reported by 68% of the parents. These included irritability (60%), headache (53%), difficulty concentrating (50%), less happiness (49%), reluctance to go to school/kindergarten (44%), malaise (42%) impaired learning (38%) and drowsiness or fatigue (37%).”</p>
2) Dangerous pathogens found on children’s face masks, Cabrera, 2021	<p>“Masks were contaminated with bacteria, parasites, and fungi, including three with dangerous pathogenic and pneumonia-causing bacteria.”</p>
3) Masks, false safety and real dangers, Part 2: Microbial challenges from masks, Borovoy, 2020/2021	<p>“Laboratory testing of used masks from 20 train commuters revealed that 11 of the 20 masks tested contained over 100,000 bacterial colonies. Molds and yeasts were also found. Three of the masks contained more than one million bacterial colonies... The outside surfaces of surgical masks were found to have high levels of the following microbes, even in hospitals, more concentrated on the outside of masks than in the environment. Staphylococcus species (57%) and Pseudomonas spp (38%) were predominant among bacteria, and Penicillium spp (39%) and Aspergillus spp. (31%) were the predominant fungi.”</p>

4) Preliminary report on surgical mask induced deoxygenation during major surgery, Beder, 2008	“Considering our findings, pulse rates of the surgeon’s increase and SpO2 decrease after the first hour. This early change in SpO2 may be either due to the facial mask or the operational stress. Since a very small decrease in saturation at this level, reflects a large decrease in PaO2, our findings may have a clinical value for the health workers and the surgeons.”
5) Mask mandates may affect a child’s emotional, intellectual development, Gillis, 2020	“The thing is we really don’t know for sure what the effect may or may not be. But what we do know is that children, especially in early childhood, they use the mouth as part of the entire face to get a sense of what’s going on around them in terms of adults and other people in their environment as far as their emotions. It also has a role in language development as well... If you think about an infant, when you interact with them you use part of your mouth. They are interested in your facial expressions. And if you think about that part of the face being covered up, there is that possibility that it could have an effect. But we don’t know because this is really an unprecedented time. What we wonder about is if this could play a role and how can we stop it if it would affect child development.”
6) Headaches and the N95 face-mask amongst healthcare providers, Lim, 2006	“Healthcare providers may develop headaches following the use of the N95 face-mask.”
7) Maximizing Fit for Cloth and Medical Procedure Masks to Improve Performance and Reduce SARS-CoV-2 Transmission and Exposure, 2021, Brooks, 2021	“Although use of double masking or knotting and tucking are two of many options that can optimize fit and enhance mask performance for source control and for wearer protection, double masking might impede breathing or obstruct peripheral vision for some wearers, and knotting and tucking can change the shape of the mask such that it no longer covers fully both the nose and the mouth of persons with larger faces.”
8) Facemasks in the COVID-19 era: A health hypothesis, Vainshelboim, 2021	“Wearing facemasks has been demonstrated to have substantial adverse physiological and psychological effects. These include hypoxia, hypercapnia, shortness of breath, increased acidity and toxicity, activation of fear and stress response, rise in stress hormones, immunosuppression, fatigue, headaches, decline in cognitive performance, predisposition for viral and infectious illnesses, chronic stress, anxiety and depression.”

<p>9) Wearing a mask can expose children to dangerous levels of carbon dioxide in just THREE MINUTES, study finds, Shaheen/Daily Mail, 2021</p>	<p>“European study found that children wearing masks for only minutes could be exposed to dangerous carbon dioxide levels...Forty-five children were exposed to carbon dioxide levels between three to twelve times healthy levels.”</p>
<p>10) How many children must die? Shilhavy, 2020</p>	<p>“How long are parents going to continue masking their children causing great harm to them, even to the point of risking their lives? Dr. Eric Nepute in St. Louis took time to record a video rant that he wants everyone to share, after the 4-year-old child of one of his patients almost died from a bacterial lung infection caused by prolonged mask use.”</p>
<p>11) Medical Doctor Warns that “Bacterial Pneumonias Are on the Rise” from Mask Wearing, Meehan, 2021</p>	<p>“I’m seeing patients that have facial rashes, fungal infections, bacterial infections. Reports coming from my colleagues, all over the world, are suggesting that the bacterial pneumonias are on the rise...Why might that be? Because untrained members of the public are wearing medical masks, repeatedly... in a non-sterile fashion... They’re becoming contaminated. They’re pulling them off of their car seat, off the rear-view mirror, out of their pocket, from their countertop, and they’re reapplying a mask that should be worn fresh and sterile every single time.”</p>
<p>12) Open Letter from Medical Doctors and Health Professionals to All Belgian Authorities and All Belgian Media, AIER, 2020</p>	<p>“Wearing a mask is not without side effects. Oxygen deficiency (headache, nausea, fatigue, loss of concentration) occurs fairly quickly, an effect similar to altitude sickness. Every day we now see patients complaining of headaches, sinus problems, respiratory problems and hyperventilation due to wearing masks. In addition, the accumulated CO2 leads to a toxic acidification of the organism which affects our immunity. Some experts even warn of an increased transmission of the virus in case of inappropriate use of the mask.”</p>
<p>13) Face coverings for covid-19: from medical intervention to social practice, Peters, 2020</p>	<p>“At present, there is no direct evidence (from studies on Covid19 and in healthy people in the community) on the effectiveness of universal masking of healthy people in the community to prevent infection with respiratory viruses, including Covid19. Contamination of the upper respiratory tract by viruses and bacteria on the outside of medical face masks has been detected in several hospitals. Another research shows that a moist mask is a breeding ground for (antibiotic resistant) bacteria and fungi, which can undermine mucosal viral immunity. This research advocates the use of medical / surgical masks (instead of homemade cotton masks) that are used once and replaced after a few hours.”</p>

<p>14) Face masks for the public during the covid-19 crisis, Lazzarino, 2020</p>	<p>“The two potential side effects that have already been acknowledged are: (1) Wearing a face mask may give a false sense of security and make people adopt a reduction in compliance with other infection control measures, including social distancing and hands washing. (2) Inappropriate use of face mask: people must not touch their masks, must change their single-use masks frequently or wash them regularly, dispose them correctly and adopt other management measures, otherwise their risks and those of others may increase. Other potential side effects that we must consider are: (3) The quality and the volume of speech between two people wearing masks is considerably compromised and they may unconsciously come closer. While one may be trained to counteract side effect n.1, this side effect may be more difficult to tackle. (4) Wearing a face mask makes the exhaled air go into the eyes. This generates an uncomfortable feeling and an impulse to touch your eyes. If your hands are contaminated, you are infecting yourself.”</p>
<p>15) Contamination by respiratory viruses on outer surface of medical masks used by hospital healthcare workers, Chughtai, 2019</p>	<p>“Respiratory pathogens on the outer surface of the used medical masks may result in self-contamination. The risk is higher with longer duration of mask use (> 6 h) and with higher rates of clinical contact. Protocols on duration of mask use should specify a maximum time of continuous use, and should consider guidance in high contact settings.”</p>
<p>16) Reusability of Facemasks During an Influenza Pandemic, Bailar, 2006</p>	<p>“After considering all the testimony and other information we received, the committee concluded that there is currently no simple, reliable way to decontaminate these devices and enable people to use them safely more than once. There is relatively little data available about how effective these devices are against flu even the first time they are used. To the extent they can help at all, they must be used correctly, and the best respirator or mask will do little to protect a person who uses it incorrectly. Substantial research must be done to increase our understanding of how flu spreads, to develop better masks and respirators, and to make it easier to decontaminate them. Finally, the use of face coverings is only one of many strategies that will be needed to slow or halt a pandemic, and people should not engage in activities that would increase their risk of exposure to flu just because they have a mask or respirator.”</p>
<p>17) Exhalation of respiratory viruses by breathing, coughing, and talking, Stelzer-Braid, 2009</p>	<p>“The exhaled aerosols generated by coughing, talking, and breathing were sampled in 50 subjects using a novel mask, and analyzed using PCR for nine respiratory viruses. The exhaled samples from a subset of 10 subjects who were PCR positive for rhinovirus</p>

	<p>were also examined by cell culture for this virus. Of the 50 subjects, among the 33 with symptoms of upper respiratory tract infections, 21 had at least one virus detected by PCR, while amongst the 17 asymptomatic subjects, 4 had a virus detected by PCR. Overall, rhinovirus was detected in 19 subjects, influenza in 4 subjects, parainfluenza in 2 subjects, and human metapneumovirus in 1 subject. Two subjects were co-infected. Of the 25 subjects who had virus-positive nasal mucus, the same virus type was detected in 12 breathing samples, 8 talking samples, and in 2 coughing samples. In the subset of exhaled samples from 10 subjects examined by culture, infective rhinovirus was detected in 2.”</p>
18) [Effect of a surgical mask on six minute walking distance], Person, 2018	<p>“Wearing a surgical mask modifies significantly and clinically dyspnea without influencing walked distance.”</p>
19) Protective masks reduce resilience, Science ORF, 2020	<p>“The German researchers used two types of face masks for their study – surgical masks and so-called FFP2 masks, which are mainly used by medical personnel. The measurements were carried out with the help of spiroergometry, in which patients or in this case the test persons exert themselves physically on a stationary bicycle – a so-called ergometer – or a treadmill. The subjects were examined without a mask, with surgical masks and with FFP2 masks. The masks therefore impair breathing, especially the volume and the highest possible speed of the air when exhaling. The maximum possible force on the ergometer was significantly reduced.”</p>
20) Wearing masks even more unhealthy than expected, Corona transition, 2020	<p>“They contain microplastics – and they exacerbate the waste problem...” Many of them are made of polyester and so you have a microplastic problem.” Many of the face masks would contain polyester with chlorine compounds: “If I have the mask in front of my face, then of course I breathe in the microplastic directly and these substances are much more toxic than if you swallow them, as they get directly into the nervous system,” Braungart continues.”</p>
21) Masking Children: Tragic, Unscientific, and Damaging, Alexander, 2021	<p>“Children do not readily acquire SARS-CoV-2 (very low risk), spread it to other children or teachers, or endanger parents or others at home. This is the settled science. In the rare cases where a child contracts Covid virus it is very unusual for the child to get severely ill or die. Masking can do positive harm to children – as it can to some adults. But the cost benefit analysis is entirely different for adults and children – particularly younger children. Whatever arguments there may be for consenting adults – children</p>

	<p>should not be required to wear masks to prevent the spread of Covid-19. Of course, zero risk is not attainable – with or without masks, vaccines, therapeutics, distancing or anything else medicine may develop or government agencies may impose.”</p>
<p>22) The Dangers of Masks, Alexander, 2021</p>	<p>“With that clarion call, we pivot and refer here to another looming concern and this is the potential danger of the chlorine, polyester, and microplastic components of the face masks (surgical principally but any of the mass-produced masks) that have become part of our daily lives due to the Covid-19 pandemic. We hope those with persuasive power in the government will listen to this plea. We hope that the necessary decisions will be made to reduce the risk to our populations.”</p>
<p>23) 13-year-old mask wearer dies for inexplicable reasons, Corona Transition, 2020</p>	<p>“The case is not only causing speculation in Germany about possible poisoning with carbon dioxide. Because the student “was wearing a corona protective mask when she suddenly collapsed and died a little later in the hospital,” writes Wochenblick.Editor’s Review: The fact that no cause of death was communicated nearly three weeks after the girl’s death is indeed unusual. The carbon dioxide content of the air is usually about 0.04 percent. From a proportion of four percent, the first symptoms of hypercapnia, i.e. carbon dioxide poisoning, appear. If the proportion of the gas rises to more than 20 percent, there is a risk of deadly carbon dioxide poisoning. However, this does not come without alarm signals from the body. According to the medical portal netdoktor, these include “sweating, accelerated breathing, accelerated heartbeat, headaches, confusion, loss of consciousness”. The unconsciousness of the girl could therefore be an indication of such poisoning.”</p>
<p>24) Student Deaths Lead Chinese Schools to Change Mask Rules, that’s, 2020</p>	<p>“During the month of April, three cases of students suffering sudden cardiac death (SCD) while running during gym class have been reported in Zhejiang, Henan and Hunan provinces. Beijing Evening News noted that all three students were wearing masks at the time of their deaths, igniting a critical discussion over school rules on when students should wear masks.”</p>
<p>25) Blaylock: Face Masks Pose Serious Risks To The Healthy, 2020</p>	<p>“As for the scientific support for the use of face mask, a recent careful examination of the literature, in which 17 of the best studies were analyzed, concluded that, “None of the studies established a conclusive relationship between mask/respirator use and protection against influenza infection.”¹ Keep in mind, no studies have been done to demonstrate that either a cloth mask or the N95 mask has any effect on transmission</p>

	<p>of the COVID-19 virus. Any recommendations, therefore, have to be based on studies of influenza virus transmission. And, as you have seen, there is no conclusive evidence of their efficiency in controlling flu virus transmission.”</p>
<p>26) The mask requirement is responsible for severe psychological damage and the weakening of the immune system, Corona Transition, 2020</p>	<p>“In fact, the mask has the potential to “trigger strong psychovegetative stress reactions via emerging aggression, which correlate significantly with the degree of stressful after-effects”.</p> <p>Prousa is not alone in her opinion. Several psychologists dealt with the mask problem — and most came to devastating results. Ignoring them would be fatal, according to Prousa.”</p>
<p>27) The physiological impact of wearing an N95 mask during hemodialysis as a precaution against SARS in patients with end-stage renal disease, Kao, 2004</p>	<p>“Wearing an N95 mask for 4 hours during HD significantly reduced PaO₂ and increased respiratory adverse effects in ESRD patients.”</p>
<p>28) Is a Mask That Covers the Mouth and Nose Free from Undesirable Side Effects in Everyday Use and Free of Potential Hazards?, Kisielinski, 2021</p>	<p>“We objectified evaluation evidenced changes in respiratory physiology of mask wearers with significant correlation of O₂ drop and fatigue ($p < 0.05$), a clustered co-occurrence of respiratory impairment and O₂ drop (67%), N95 mask and CO₂ rise (82%), N95 mask and O₂ drop (72%), N95 mask and headache (60%), respiratory impairment and temperature rise (88%), but also temperature rise and moisture (100%) under the masks. Extended mask-wearing by the general population could lead to relevant effects and consequences in many medical fields.”</p> <p>“Here are the pathophysiological changes and subjective complaints: 1) Increase in blood carbon dioxide 2) Increase in breathing resistance 3) Decrease in blood oxygen saturation 4) Increase in heart rate 5) Decrease in cardiopulmonary capacity 6) Feeling of exhaustion 7) Increase in respiratory rate 8) Difficulty breathing and shortness of breath 9) Headache 10) Dizziness 11) Feeling of dampness and heat 12) Drowsiness (qualitative neurological deficits) 13) Decrease in empathy perception 14) Impaired skin barrier function with acne, itching and skin lesions”</p>
<p>29) Is N95 face mask linked to dizziness and headache?, Ipek, 2021</p>	<p>“Respiratory alkalosis and hypocarbia were detected after the use of N95. Acute respiratory alkalosis can cause headache, anxiety, tremor, muscle cramps. In this study, it was quantitatively shown that the participants’ symptoms were due to respiratory alkalosis and hypocarbia.”</p>

<p>30) COVID-19 prompts a team of engineers to rethink the humble face mask, Myers, 2020</p>	<p>“But in filtering those particles, the mask also makes it harder to breathe. N95 masks are estimated to reduce oxygen intake by anywhere from 5 to 20 percent. That’s significant, even for a healthy person. It can cause dizziness and lightheadedness. If you wear a mask long enough, it can damage the lungs. For a patient in respiratory distress, it can even be life threatening.”</p>
<p>31) 70 doctors in open letter to Ben Weyts: ‘Abolish mandatory mouth mask at school’ – Belgium, World Today News, 2020</p>	<p>“In an open letter to the Flemish Minister of Education Ben Weyts (N-VA), 70 doctors ask to abolish the mandatory mouth mask at school, both for the teachers and for the students. Weyts does not intend to change course. The doctors ask that Minister Ben Weyts immediately reverses his working method: no mouth mask obligation at school, only protect the risk group and only the advice that people with a possible risk profile should consult their doctor.”</p>
<p>32) Face masks pose dangers for babies, toddlers during COVID-19 pandemic, UC Davis Health, 2020</p>	<p>“Masks may present a choking hazard for young children. Also, depending on the mask and the fit, the child may have trouble breathing. If this happens, they need to be able to take it off,” said UC Davis pediatrician Lena van der List. “Children less than 2 years of age will not reliably be able to remove a face mask and could suffocate. Therefore, masks should not routinely be used for young children...” “The younger the child, the more likely they will be to not wear the mask properly, reach under the mask and touch potentially contaminated masks,” said Dean Blumberg, chief of pediatric infectious diseases at UC Davis Children’s Hospital. “Of course, this depends on the developmental level of the individual child. But I think masks are not likely to provide much potential benefit over risk until the teen years.”</p>
<p>33) Covid-19: Important potential side effects of wearing face masks that we should bear in mind, Lazzarino, 2020</p>	<p>“Other potential side effects that we must consider, however, are 1) The quality and volume of speech between people wearing masks is considerably compromised and they may unconsciously come closer 2) Wearing a mask makes the exhaled air go into the eyes. This generates an impulse to touch the eyes. 3) If your hands are contaminated, you are infecting yourself, 4) Face masks make breathing more difficult. Moreover, a fraction of carbon dioxide previously exhaled is inhaled at each respiratory cycle. Those phenomena increase breathing frequency and deepness, and they may worsen the burden of covid-19 if infected people wearing masks spread more contaminated air. This may also worsen the clinical condition of infected people if the enhanced breathing pushes the viral load down into their lungs, 5) The innate immunity’s efficacy is highly dependent on the viral load. If masks determine a humid</p>

	<p>habitat where SARS-CoV-2 can remain active because of the water vapour continuously provided by breathing and captured by the mask fabric, they determine an increase in viral load (by re-inhaling exhaled viruses) and therefore they can cause a defeat of the innate immunity and an increase in infections.”</p>
<p>34) Risks of N95 Face Mask Use in Subjects With COPD, Kyung, 2020</p>	<p>“Of the 97 subjects, 7 with COPD did not wear the N95 for the entire test duration. This mask-failure group showed higher British modified Medical Research Council dyspnea scale scores and lower FEV₁ percent of predicted values than did the successful mask use group. A modified Medical Research Council dyspnea scale score ≥ 3 (odds ratio 167, 95% CI 8.4 to >999.9; P = .008) or a FEV₁ < 30% predicted (odds ratio 163, 95% CI 7.4 to >999.9; P = .001) was associated with a risk of failure to wear the N95. Breathing frequency, blood oxygen saturation, and exhaled carbon dioxide levels also showed significant differences before and after N95 use.”</p>
<p>35) Masks too dangerous for children under 2, medical group warns, The Japan Times, 2020</p>	<p>“Children under the age of 2 shouldn’t wear masks because they can make breathing difficult and increase the risk of choking, a medical group has said, launching an urgent appeal to parents as the nation reopens from the coronavirus crisis...Masks can make breathing difficult because infants have narrow air passages,” which increases the burden on their hearts, the association said, adding that masks also raise the risk of heat stroke for them.”</p>
<p>36) Face masks can be problematic, dangerous to health of some Canadians: advocates, Spenser, 2020</p>	<p>“Face masks are dangerous to the health of some Canadians and problematic for some others...Asthma Canada president and CEO Vanessa Foran said simply wearing a mask could create risk of an asthma attack.”</p>
<p>37) COVID-19 Masks Are a Crime Against Humanity and Child Abuse, Griesz-Brisson, 2020</p>	<p>“The rebreathing of our exhaled air will without a doubt create oxygen deficiency and a flooding of carbon dioxide. We know that the human brain is very sensitive to oxygen depravation. There are nerve cells for example in the hippocampus, that can’t be longer than 3 minutes without oxygen – they cannot survive. The acute warning symptoms are headaches, drowsiness, dizziness, issues in concentration, slowing down of the reaction time – reactions of the cognitive system. However, when you have chronic oxygen depravation, all of those symptoms disappear, because you get used to it. But your efficiency will remain impaired and the undersupply of oxygen in your brain continues to progress. We know that neurodegenerative diseases take years to decades to develop. If today you forget your phone number, the breakdown in your</p>

	<p>brain would have already started 20 or 30 years ago...The child needs the brain to learn, and the brain needs oxygen to function. We don't need a clinical study for that. This is simple, indisputable physiology. Conscious and purposely induced oxygen deficiency is an absolutely deliberate health hazard, and an absolute medical contraindication."</p>
<p>38) Study shows how masks are harming children, Mercola, 2021</p>	<p>"Data from the first registry to record children's experiences with masks show physical, psychological and behavioral issues including irritability, difficulty concentrating and impaired learning. Since school shutdowns in spring 2020, an increasing number of parents are seeking drug treatment for attention deficit hyperactivity disorder (ADHD) for their children. Evidence from the U.K. shows schools are not the super spreaders health officials said they were; measured rates of infection in schools were the same as the community, not higher. A large randomized controlled trial showed wearing masks does not reduce the spread of SARS-CoV-2."</p>
<p>39) New Study Finds Masks Hurt Schoolchildren Physically, Psychologically, and Behaviorally, Hall, 2021 https://www.researchsquare.com/article/rs-124394/v2</p>	<p>"A new study, involving over 25,000 school-aged children, shows that masks are harming schoolchildren physically, psychologically, and behaviorally, revealing 24 distinct health issues associated with wearing masks... Though these results are concerning, the study also found that 29.7% of children experienced shortness of breath, 26.4% experienced dizziness, and hundreds of the participants experiencing accelerated respiration, tightness in chest, weakness, and short-term impairment of consciousness."</p>
<p>40) Protective Face Masks: Effect on the Oxygenation and Heart Rate Status of Oral Surgeons during Surgery, Scarano, 2021</p>	<p>"In all 20 surgeons wearing FFP2 covered by surgical masks, a reduction in arterial O₂ saturation from around 97.5% before surgery to 94% after surgery was recorded with increase of heart rates. A shortness of breath and light-headedness/headaches were also noted."</p>
<p>41) Effects of surgical and FFP2/N95 face masks on cardiopulmonary exercise capacity, Fikenzer, 2020</p>	<p>"Ventilation, cardiopulmonary exercise capacity and comfort are reduced by surgical masks and highly impaired by FFP2/N95 face masks in healthy individuals. These data are important for recommendations on wearing face masks at work or during physical exercise."</p>

42) Headaches Associated With Personal Protective Equipment – A Cross-Sectional Study Among Frontline Healthcare Workers During COVID-19, Ong, 2020	“Most healthcare workers develop de novo PPE-associated headaches or exacerbation of their pre-existing headache disorders.”
43) Open letter from medical doctors and health professionals to all Belgian authorities and all Belgian media, The American Institute of Stress, 2020	“Wearing a mask is not without side effects. Oxygen deficiency (headache, nausea, fatigue, loss of concentration) occurs fairly quickly, an effect similar to altitude sickness. Every day we now see patients complaining of headaches, sinus problems, respiratory problems, and hyperventilation due to wearing masks. In addition, the accumulated CO2 leads to a toxic acidification of the organism which affects our immunity. Some experts even warn of increased transmission of the virus in case of inappropriate use of the mask.”
44) Reusing masks may increase your risk of coronavirus infection, expert says, Laguipo, 2020	“For the public, they should not wear facemasks unless they are sick, and if a healthcare worker advised them.”For the average member of the public walking down a street, it is not a good idea,” Dr. Harries said.”What tends to happen is people will have one mask. They won’t wear it all the time, they will take it off when they get home, they will put it down on a surface they haven’t cleaned,” she added.Further, she added that behavioral issues could adversely put themselves at more risk of getting the infection. For instance, people go out and don’t wash their hands, they touch parts of the mask or their face, and they get infected.”
45) What’s Going On Under the Masks?, Wright, 2021	“Americans today have pretty good chompers on average, at least relative to most other people, past and present. Nevertheless, we do not think enough about oral health as evidenced by the almost complete lack of discussion regarding the effect of lockdowns and mandatory masking on our mouths.”
46) Experimental Assessment of Carbon Dioxide Content in Inhaled Air With or Without Face Masks in Healthy ChildrenA Randomized Clinical Trial, Walach, 2021	“A large-scale survey in Germany of adverse effects in parents and children using data of 25 930 children has shown that 68% of the participating children had problems when wearing nose and mouth coverings.”
47) NM Kids forced to wear masks while running in 100-degree heat; Parents are striking back, Smith, 2021	“Nationally, children have a 99.997% survival rate from COVID-19. In New Mexico, only 0.7% of child COVID-19 cases have resulted in hospitalization. It is clear that children have an extremely low risk of severe illness or death from COVID-19, and mask

	mandates are placing a burden upon kids which is detrimental to their own health and well-being.”
48) Health Canada issues advisory for disposable masks with graphene, CBC, 2021	“Health Canada is advising Canadians not to use disposable face masks that contain graphene. Health Canada issued the notice on Friday and said wearers could inhale graphene, a single layer of carbon atoms. Masks containing the toxic particles may have been distributed in some health-care facilities.”
49) COVID-19: Performance study of microplastic inhalation risk posed by wearing masks, Li, 2021 Is graphene safe?	“Wearing masks considerably reduces the inhalation risk of particles (e.g., granular microplastics and unknown particles) even when they are worn continuously for 720 h. Surgical, cotton, fashion, and activated carbon masks wearing pose higher fiber-like microplastic inhalation risk, while all masks generally reduced exposure when used under their supposed time (<4 h). N95 poses less fiber-like microplastic inhalation risk. Reusing masks after they underwent different disinfection pre-treatment processes can increase the risk of particle (e.g., granular microplastics) and fiber-like microplastic inhalation. Ultraviolet disinfection exerts a relatively weak effect on fiber-like microplastic inhalation, and thus, it can be recommended as a treatment process for reusing masks if proven effective from microbiological standpoint. Wearing an N95 mask reduces the inhalation risk of spherical-type microplastics by 25.5 times compared with not wearing a mask.”
50) Manufacturers have been using nanotechnology-derived graphene in face masks — now there are safety concerns, Maynard, 2021	“Early concerns around graphene were sparked by previous research on another form of carbon — carbon nanotubes. It turns out that some forms of these fiber-like materials can cause serious harm if inhaled. And following on from research here, a natural next-question to ask is whether carbon nanotubes’ close cousin graphene comes with similar concerns. Because graphene lacks many of the physical and chemical aspects of carbon nanotubes that make them harmful (such as being long, thin, and hard for the body to get rid of), the indications are that the material is safer than its nanotube cousins. But safer doesn’t mean safe. And current research indicates that this is not a material that should be used where it could potentially be inhaled, without a good amount of safety testing first...As a general rule of thumb, engineered nanomaterials should not be used in products where they might inadvertently be inhaled and reach the sensitive lower regions of the lungs.”

<p>51) Masking young children in school harms language acquisition, Walsh, 2021</p>	<p>“This is important because children and/or students do not have the speech or language ability that adults have — they are not equally able and the ability to see the face and especially the mouth is critical to language acquisition which children and/or students are engaged in at all times. Furthermore, the ability to see the mouth is not only essential to communication but also essential to brain development.” “Studies show that by age four, kids from low-income households will hear 30 million less words than their more affluent counterparts, who get more quality face-time with caretakers.” (https://news.stanford.edu/news/2014/november/language-toddlers-ferna1d-110514.html).”</p>
<p>52) Dangerous pathogens found on children’s face masks, Rational Ground, 2021</p>	<p>“A group of parents in Gainesville, FL, sent 6 face masks to a lab at the University of Florida, requesting an analysis of contaminants found on the masks after they had been worn. The resulting report found that five masks were contaminated with bacteria, parasites, and fungi, including three with dangerous pathogenic and pneumonia-causing bacteria. Although the test is capable of detecting viruses, including SARS-CoV-2, only one virus was found on one mask (alcelaphine herpesvirus 1)...Half of the masks were contaminated with one or more strains of pneumonia-causing bacteria. One-third were contaminated with one or more strains of meningitis-causing bacteria. One-third were contaminated with dangerous, antibiotic-resistant bacterial pathogens. In addition, less dangerous pathogens were identified, including pathogens that can cause fever, ulcers, acne, yeast infections, strep throat, periodontal disease, Rocky Mountain Spotted Fever, and more.”</p>
<p>53) Face mask dermatitis” due to compulsory facial masks during the SARS-CoV-2 pandemic: data from 550 health care and non-health care workers in Germany, Niesert, 2021</p>	<p>“The duration of wearing masks showed a significant impact on the prevalence of symptoms ($p < 0.001$). Type IV hypersensitivity was significantly more likely in participants with symptoms compared to those without symptoms ($p = 0.001$), whereas no increase in symptoms was observed in participants with atopic diathesis. HCWs used facial skin care products significantly more often than non-HCWs ($p = 0.001$).”</p>
<p>54) Effect of Wearing Face Masks on the Carbon Dioxide Concentration in the Breathing Zone, AAQR/Geiss, 2020</p>	<p>“Detected carbon dioxide concentrations ranged from 2150 ± 192 to 2875 ± 323 ppm. The concentrations of carbon dioxide while not wearing a face mask varied from 500–900 ppm. Doing office work and standing still on the treadmill each resulted in carbon dioxide concentrations of around 2200 ppm. A small increase could be observed when walking at a speed of 3 km h⁻¹ (leisurely walking pace)...concentrations in the</p>

	detected range can cause undesirable symptoms, such as fatigue, headache, and loss of concentration.”
55) Surgical masks as source of bacterial contamination during operative procedures, Zhiqing, 2018	“The source of bacterial contamination in SMs was the body surface of the surgeons rather than the OR environment. Moreover, we recommend that surgeons should change the mask after each operation, especially those beyond 2 hours.”
56) The Damage of Masking Children Could be Irreparable, Hussey, 2021	“When we surround children with mask-wearers for a year at a time, are we impairing their face barcode recognition during a period of hot neural development, thus putting full development of the FFA at risk? Does the demand for separation from others, reducing social interaction, add to the potential consequences as it might in autism? When can we be sure that we won’t interfere with visual input to the face recognition visual neurology so we don’t interfere with brain development? How much time with stimulus interference can we allow without consequences? Those are all questions currently without answers; we don’t know. Unfortunately, the science implies that if we mess up brain development for faces, we may not currently have therapies to undo everything we’ve done.”
57) Masks can be Murder, Grossman, 2021	“Wearing masks can create a sense of anonymity for an aggressor, while also dehumanizing the victim. This prevents empathy, empowering violence, and murder.” Masking helps remove empathy and compassion, allowing others to commit unspeakable acts on the masked person.”
58) London high school teacher calls face masks an ‘egregious and unforgivable form of child abuse, Butler, 2020	“In his email, Farquharson called the campaign to legislate mask wearing a “shameful farce, a charade, an act of political theatre” that’s more about enforcing “obedience and compliance” than it is about public health. He also likened children wearing masks to “involuntary self-torture,” calling it “an egregious and unforgivable form of child abuse and physical assault.”
59) UK Government Advisor Admits Masks Are Just “Comfort Blankets” That Do Virtually Nothing, ZeroHedge, 2021	“As the UK Government heralds “freedom day” today, which is anything but , a prominent government scientific advisor has admitted that face masks do very little to protect from coronavirus and are basically just “comfort blankets...the professor noted that “those aerosols escape masks and will render the mask ineffective,” adding “The public were demanding something must be done, they got masks, it is just a comfort blanket. But now it is entrenched, and we are entrenching bad behaviour...all

	<p>around the world you can look at mask mandates and superimpose on infection rates, you cannot see that mask mandates made any effect whatsoever,” Axon further noted, adding that “The best thing you can say about any mask is that any positive effect they do have is too small to be measured.”</p>
<p>60) Masks, false safety and real dangers, Part 1: Friable mask particulate and lung vulnerability, Borovoy, 2020</p>	<p>“Surgical personnel are trained to never touch any part of a mask, except the loops and the nose bridge. Otherwise, the mask is considered useless and is to be replaced. Surgical personnel are strictly trained not to touch their masks otherwise. However, the general public may be seen touching various parts of their masks. Even the masks just removed from manufacturer packaging have been shown in the above photos to contain particulate and fiber that would not be optimal to inhale... Further concerns of macrophage response and other immune and inflammatory and fibroblast response to such inhaled particles specifically from facemasks should be the subject of more research. If widespread masking continues, then the potential for inhaling mask fibers and environmental and biological debris continues on a daily basis for hundreds of millions of people. This should be alarming for physicians and epidemiologists knowledgeable in occupational hazards.”</p>
<p>61) Medical Masks, Desai, 2020</p>	<p>“Face masks should be used only by individuals who have symptoms of respiratory infection such as coughing, sneezing, or, in some cases, fever. Face masks should also be worn by health care workers, by individuals who are taking care of or are in close contact with people who have respiratory infections, or otherwise as directed by a doctor. Face masks should not be worn by healthy individuals to protect themselves from acquiring respiratory infection because there is no evidence to suggest that face masks worn by healthy individuals are effective in preventing people from becoming ill.”</p>

Evidence on natural immunity versus COVID-19 vaccine induced immunity:

Study/report title, author, and year published and interactive url link	Predominant finding on natural immunity
1) Necessity of COVID-19 vaccination in previously infected individuals , Shrestha, 2021	“Cumulative incidence of COVID-19 was examined among 52,238 employees in an American healthcare system. The cumulative incidence of SARS-CoV-2 infection remained almost zero among previously infected unvaccinated subjects, previously infected subjects who were vaccinated, and previously uninfected subjects who were vaccinated, compared with a steady increase in cumulative incidence among previously uninfected subjects who remained unvaccinated. Not one of the 1359 previously infected subjects who remained unvaccinated had a SARS-CoV-2 infection over the duration of the study. Individuals who have had SARS-CoV-2 infection are unlikely to benefit from COVID-19 vaccination...”
2) SARS-CoV-2-specific T cell immunity in cases of COVID-19 and SARS, and uninfected controls , Le Bert, 2020	“Studied T cell responses against the structural (nucleocapsid (N) protein) and non-structural (NSP7 and NSP13 of <i>ORF1</i>) regions of SARS-CoV-2 in individuals convalescing from coronavirus disease 2019 (COVID-19) ($n = 36$). In all of these individuals, we found CD4 and CD8 T cells that recognized multiple regions of the N protein...showed that patients ($n = 23$) who recovered from SARS possess long-lasting memory T cells that are reactive to the N protein of SARS-CoV 17 years after the outbreak of SARS in 2003; these T cells displayed robust cross-reactivity to the N protein of SARS-CoV-2.”
3) Comparing SARS-CoV-2 natural immunity to vaccine-induced immunity: reinfections versus breakthrough infections , Gazit, 2021	“A retrospective observational study comparing three groups: (1) SARS-CoV-2-naïve individuals who received a two-dose regimen of the BioNTech/Pfizer mRNA BNT162b2 vaccine, (2) previously infected individuals who have not been vaccinated, and (3) previously infected <i>and</i> single dose vaccinated individuals found para a 13 fold increased risk of breakthrough Delta infections in double vaccinated persons, and a 27 fold increased risk for symptomatic breakthrough infection in the double vaccinated relative to the natural immunity recovered persons...the risk of hospitalization was 8 times higher in the double vaccinated (para)...this analysis demonstrated that natural immunity affords longer lasting and stronger protection against infection, symptomatic disease

	and hospitalization due to the Delta variant of SARS-CoV-2, compared to the BNT162b2 two-dose vaccine-induced immunity.”
4) Highly functional virus-specific cellular immune response in asymptomatic SARS-CoV-2 infection , Le Bert, 2021	“Studied SARS-CoV-2-specific T cells in a cohort of asymptomatic ($n = 85$) and symptomatic ($n = 75$) COVID-19 patients after seroconversion...thus, asymptomatic SARS-CoV-2-infected individuals are not characterized by weak antiviral immunity; on the contrary, they mount a highly functional virus-specific cellular immune response.”
5) Large-scale study of antibody titer decay following BNT162b2 mRNA vaccine or SARS-CoV-2 infection , Israel, 2021	“A total of 2,653 individuals fully vaccinated by two doses of vaccine during the study period and 4,361 convalescent patients were included. Higher SARS-CoV-2 IgG antibody titers were observed in vaccinated individuals (median 1581 AU/mL IQR [533.8-5644.6]) after the second vaccination, than in convalescent individuals (median 355.3 AU/mL IQR [141.2-998.7]; $p < 0.001$). In vaccinated subjects, antibody titers decreased by up to 40% each subsequent month while in convalescents they decreased by less than 5% per month...this study demonstrates individuals who received the Pfizer-BioNTech mRNA vaccine have different kinetics of antibody levels compared to patients who had been infected with the SARS-CoV-2 virus, with higher initial levels but a much faster exponential decrease in the first group”.
6) SARS-CoV-2 re-infection risk in Austria , Pilz, 2021	Researchers recorded “40 tentative re-infections in 14, 840 COVID-19 survivors of the first wave (0.27%) and 253 581 infections in 8, 885, 640 individuals of the remaining general population (2.85%) translating into an odds ratio (95% confidence interval) of 0.09 (0.07 to 0.13)...relatively low re-infection rate of SARS-CoV-2 in Austria. Protection against SARS-CoV-2 after natural infection is comparable with the highest available estimates on vaccine efficacies.” Additionally, hospitalization in only five out of 14,840 (0.03%) people and death in one out of 14,840 (0.01%) (tentative re-infection).
7) mRNA vaccine-induced SARS-CoV-2-specific T cells recognize B.1.1.7 and B.1.351 variants but differ in longevity and homing properties depending on prior infection status , Neidلمان, 2021	“Spike-specific T cells from convalescent vaccinees differed strikingly from those of infection-naïve vaccinees, with phenotypic features suggesting superior long-term persistence and ability to home to the respiratory tract including the nasopharynx. These results provide reassurance that vaccine-

	elicited T cells respond robustly to the B.1.1.7 and B.1.351 variants, confirm that convalescents may not need a second vaccine dose.”
8) Good news: Mild COVID-19 induces lasting antibody protection , Bhandari, 2021	“Months after recovering from mild cases of COVID-19, people still have immune cells in their body pumping out antibodies against the virus that causes COVID-19, according to a study from researchers at Washington University School of Medicine in St. Louis. Such cells could persist for a lifetime, churning out antibodies all the while. The findings, published May 24 in the journal Nature, suggest that mild cases of COVID-19 leave those infected with lasting antibody protection and that repeated bouts of illness are likely to be uncommon.”
9) Robust neutralizing antibodies to SARS-CoV-2 infection persist for months , Wajnberg, 2021	“Neutralizing antibody titers against the SARS-CoV-2 spike protein persisted for at least 5 months after infection. Although continued monitoring of this cohort will be needed to confirm the longevity and potency of this response, these preliminary results suggest that the chance of reinfection may be lower than is currently feared.”
10) Evolution of Antibody Immunity to SARS-CoV-2 , Gaebler, 2020	“Concurrently, neutralizing activity in plasma decreases by five-fold in pseudo-type virus assays. In contrast, the number of RBD-specific memory B cells is unchanged. Memory B cells display clonal turnover after 6.2 months, and the antibodies they express have greater somatic hypermutation, increased potency and resistance to RBD mutations, indicative of continued evolution of the humoral response...we conclude that the memory B cell response to SARS-CoV-2 evolves between 1.3 and 6.2 months after infection in a manner that is consistent with antigen persistence.”
11) Persistence of neutralizing antibodies a year after SARS-CoV-2 infection in humans , Haveri, 2021	“Assessed the persistence of serum antibodies following WT SARS-CoV-2 infection at 8 and 13 months after diagnosis in 367 individuals...found that NAb against the WT virus persisted in 89% and S-IgG in 97% of subjects for at least 13 months after infection.”
12) Quantifying the risk of SARS-CoV-2 reinfection over time , Murchu, 2021	“Eleven large cohort studies were identified that estimated the risk of SARS-CoV-2 reinfection over time, including three that enrolled healthcare workers and two that enrolled residents and staff of elderly care homes. Across studies,

	<p>the total number of PCR-positive or antibody-positive participants at baseline was 615,777, and the maximum duration of follow-up was more than 10 months in three studies. Reinfection was an uncommon event (absolute rate 0%–1.1%), with no study reporting an increase in the risk of reinfection over time.”</p>
<p>13) Natural immunity to covid is powerful. Policymakers seem afraid to say so, Makary, 2021</p> <p>The Western Journal-Makary</p>	<p>Makary writes “it’s okay to have an incorrect scientific hypothesis. But when new data proves it wrong, you have to adapt. Unfortunately, many elected leaders and public health officials have held on far too long to the hypothesis that natural immunity offers unreliable protection against covid-19 — a contention that is being rapidly debunked by science. More than 15 studies have demonstrated the power of immunity acquired by previously having the virus. A 700,000-person study from Israel two weeks ago found that those who had experienced prior infections were 27 times less likely to get a second symptomatic covid infection than those who were vaccinated. This affirmed a June Cleveland Clinic study of health-care workers (who are often exposed to the virus), in which none who had previously tested positive for the coronavirus got reinfected. The study authors concluded that “individuals who have had SARS-CoV-2 infection are unlikely to benefit from covid-19 vaccination.” And in May, a Washington University study found that even a mild covid infection resulted in long-lasting immunity.”</p> <p>“The data on natural immunity are now overwhelming,” Makary told the Morning Wire. “It turns out the hypothesis that our public health leaders had that vaccinated immunity is better and stronger than natural immunity was wrong. They got it backwards. And now we’ve got data from Israel showing that natural immunity is 27 times more effective than vaccinated immunity.”</p>
<p>14) SARS-CoV-2 elicits robust adaptive immune responses regardless of disease severity, Nielsen, 2021</p>	<p>“203 recovered SARS-CoV-2 infected patients in Denmark between April 3rd and July 9th 2020, at least 14 days after COVID-19 symptom recovery... report broad serological profiles within the cohort, detecting antibody binding to other human coronaviruses... the viral surface spike protein was identified as the dominant target for both neutralizing antibodies and CD8⁺ T-cell responses. Overall, the majority of patients had robust adaptive immune responses, regardless of their disease severity.”</p>

<p>15) <u>Protection of previous SARS-CoV-2 infection is similar to that of BNT162b2 vaccine protection: A three-month nationwide experience from Israel</u>, Goldberg, 2021</p>	<p>“Analyze an updated individual-level database of the entire population of Israel to assess the protection efficacy of both prior infection and vaccination in preventing subsequent SARS-CoV-2 infection, hospitalization with COVID-19, severe disease, and death due to COVID-19... vaccination was highly effective with overall estimated efficacy for documented infection of 92·8% (CI:[92·6, 93·0]); hospitalization 94·2% (CI:[93·6, 94·7]); severe illness 94·4% (CI:[93·6, 95·0]); and death 93·7% (CI:[92·5, 94·7]). Similarly, the overall estimated level of protection from prior SARS-CoV-2 infection for documented infection is 94·8% (CI: [94·4, 95·1]); hospitalization 94·1% (CI: [91·9, 95·7]); and severe illness 96·4% (CI: [92·5, 98·3])...results question the need to vaccinate previously-infected individuals.”</p>
<p>16) <u>Incidence of Severe Acute Respiratory Syndrome Coronavirus-2 infection among previously infected or vaccinated employees</u>, Kojima, 2021</p>	<p>“Employees were divided into three groups: (1) SARS-CoV-2 naïve and unvaccinated, (2) previous SARS-CoV-2 infection, and (3) vaccinated. Person-days were measured from the date of the employee first test and truncated at the end of the observation period. SARS-CoV-2 infection was defined as two positive SARS-CoV-2 PCR tests in a 30-day period... 4313, 254 and 739 employee records for groups 1, 2, and 3...previous SARS-CoV-2 infection and vaccination for SARS-CoV-2 were associated with decreased risk for infection or re-infection with SARS-CoV-2 in a routinely screened workforce. There was no difference in the infection incidence between vaccinated individuals and individuals with previous infection.”</p>
<p>17) <u>Having SARS-CoV-2 once confers much greater immunity than a vaccine—but vaccination remains vital</u>, Wadman, 2021</p>	<p>“Israelis who had an infection were more protected against the Delta coronavirus variant than those who had an already highly effective COVID-19 vaccine...the newly released data show people who once had a SARS-CoV-2 infection were much less likely than never-infected, vaccinated people to get Delta, develop symptoms from it, or become hospitalized with serious COVID-19.”</p>
<p>18) <u>One-year sustained cellular and humoral immunities of COVID-19 convalescents</u>, Zhang, 2021</p>	<p>“A systematic antigen-specific immune evaluation in 101 COVID-19 convalescents; SARS-CoV-2-specific IgG antibodies, and also NAb can persist among over 95% COVID-19 convalescents from 6 months to 12 months after disease onset. At least 19/71 (26%) of COVID-19 convalescents (double positive in ELISA and MCLIA) had detectable circulating IgM antibody against SARS-CoV-</p>

	<p>2 at 12m post-disease onset. Notably, the percentages of convalescents with positive SARS-CoV-2-specific T-cell responses (at least one of the SARS-CoV-2 antigen S1, S2, M and N protein) were 71/76 (93%) and 67/73 (92%) at 6m and 12m, respectively.”</p>
<p>19) Functional SARS-CoV-2-Specific Immune Memory Persists after Mild COVID-19, Rodda, 2021</p>	<p>“Recovered individuals developed SARS-CoV-2-specific immunoglobulin (IgG) antibodies, neutralizing plasma, and memory B and memory T cells that persisted for at least 3 months. Our data further reveal that SARS-CoV-2-specific IgG memory B cells increased over time. Additionally, SARS-CoV-2-specific memory lymphocytes exhibited characteristics associated with potent antiviral function: memory T cells secreted cytokines and expanded upon antigen re-encounter, whereas memory B cells expressed receptors capable of neutralizing virus when expressed as monoclonal antibodies. Therefore, mild COVID-19 elicits memory lymphocytes that persist and display functional hallmarks of antiviral immunity.”</p>
<p>20) Discrete Immune Response Signature to SARS-CoV-2 mRNA Vaccination Versus Infection, Ivanova, 2021</p>	<p>“Performed multimodal single-cell sequencing on peripheral blood of patients with acute COVID-19 and healthy volunteers before and after receiving the SARS-CoV-2 BNT162b2 mRNA vaccine to compare the immune responses elicited by the virus and by this vaccine...both infection and vaccination induced robust innate and adaptive immune responses, our analysis revealed significant qualitative differences between the two types of immune challenges. In COVID-19 patients, immune responses were characterized by a highly augmented interferon response which was largely absent in vaccine recipients. Increased interferon signaling likely contributed to the observed dramatic upregulation of cytotoxic genes in the peripheral T cells and innate-like lymphocytes in patients but not in immunized subjects. Analysis of B and T cell receptor repertoires revealed that while the majority of clonal B and T cells in COVID-19 patients were effector cells, in vaccine recipients clonally expanded cells were primarily circulating memory cells...we observed the presence of cytotoxic CD4 T cells in COVID-19 patients that were largely absent in healthy volunteers following immunization. While hyper-activation of inflammatory responses and cytotoxic cells may contribute to immunopathology in severe illness, in mild and moderate disease, these</p>

	features are indicative of protective immune responses and resolution of infection.”
21) SARS-CoV-2 infection induces long-lived bone marrow plasma cells in humans , Turner, 2021	“Bone marrow plasma cells (BMPCs) are a persistent and essential source of protective antibodies... durable serum antibody titres are maintained by long-lived plasma cells—non-replicating, antigen-specific plasma cells that are detected in the bone marrow long after the clearance of the antigen ... S-binding BMPCs are quiescent, which suggests that they are part of a stable compartment. Consistently, circulating resting memory B cells directed against SARS-CoV-2 S were detected in the convalescent individuals. Overall, our results indicate that mild infection with SARS-CoV-2 induces robust antigen-specific, long-lived humoral immune memory in humans...overall, our data provide strong evidence that SARS-CoV-2 infection in humans robustly establishes the two arms of humoral immune memory: long-lived bone marrow plasma cells (BMPCs) and memory B-cells.”
22) SARS-CoV-2 infection rates of antibody-positive compared with antibody-negative health-care workers in England: a large, multicentre, prospective cohort study (SIREN) , Jane Hall, 2021	“The SARS-CoV-2 Immunity and Reinfection Evaluation study... 30 625 participants were enrolled into the study... a previous history of SARS-CoV-2 infection was associated with an 84% lower risk of infection, with median protective effect observed 7 months following primary infection. This time period is the minimum probable effect because seroconversions were not included. This study shows that previous infection with SARS-CoV-2 induces effective immunity to future infections in most individuals.”
23) Pandemic peak SARS-CoV-2 infection and seroconversion rates in London frontline health-care workers , Houlihan, 2020	“Enrolled 200 patient-facing HCWs between March 26 and April 8, 2020...represents a 13% infection rate (i.e. 14 of 112 HCWs) within the 1 month of follow-up in those with no evidence of antibodies or viral shedding at enrolment. By contrast, of 33 HCWs who tested positive by serology but tested negative by RT-PCR at enrolment, 32 remained negative by RT-PCR through follow-up, and one tested positive by RT-PCR on days 8 and 13 after enrolment.”
24) Antibodies to SARS-CoV-2 are associated with protection against reinfection , Lumley, 2021	“Critical to understand whether infection with Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) protects from subsequent reinfection... 12219 HCWs participated...prior SARS-CoV-2 infection that generated antibody

	responses offered protection from reinfection for most people in the six months following infection.”
25) Longitudinal analysis shows durable and broad immune memory after SARS-CoV-2 infection with persisting antibody responses and memory B and T cells , Cohen, 2021	“Evaluate 254 COVID-19 patients longitudinally up to 8 months and find durable broad-based immune responses. SARS-CoV-2 spike binding and neutralizing antibodies exhibit a bi-phasic decay with an extended half-life of >200 days suggesting the generation of longer-lived plasma cells... most recovered COVID-19 patients mount broad, durable immunity after infection, spike IgG+ memory B cells increase and persist post-infection, durable polyfunctional CD4 and CD8 T cells recognize distinct viral epitope regions.”
26) Single cell profiling of T and B cell repertoires following SARS-CoV-2 mRNA vaccine , Sureshchandra, 2021	“Used single-cell RNA sequencing and functional assays to compare humoral and cellular responses to two doses of mRNA vaccine with responses observed in convalescent individuals with asymptomatic disease... natural infection induced expansion of larger CD8 T cell clones occupied distinct clusters, likely due to the recognition of a broader set of viral epitopes presented by the virus not seen in the mRNA vaccine.”
27) SARS-CoV-2 antibody-positivity protects against reinfection for at least seven months with 95% efficacy , Abu-Raddad, 2021	“SARS-CoV-2 antibody-positive persons from April 16 to December 31, 2020 with a PCR-positive swab ≥ 14 days after the first-positive antibody test were investigated for evidence of reinfection, 43,044 antibody-positive persons who were followed for a median of 16.3 weeks...reinfection is rare in the young and international population of Qatar. Natural infection appears to elicit strong protection against reinfection with an efficacy ~95% for at least seven months.”
28) Orthogonal SARS-CoV-2 Serological Assays Enable Surveillance of Low-Prevalence Communities and Reveal Durable Humoral Immunity , Ripperger, 2020	“Conducted a serological study to define correlates of immunity against SARS-CoV-2. Compared to those with mild coronavirus disease 2019 (COVID-19) cases, individuals with severe disease exhibited elevated virus-neutralizing titers and antibodies against the nucleocapsid (N) and the receptor binding domain (RBD) of the spike protein...neutralizing and spike-specific antibody production persists for at least 5–7 months... nucleocapsid antibodies frequently become undetectable by 5–7 months.”
29) Anti-spike antibody response to natural SARS-CoV-2 infection in the general population , Wei, 2021	“In the general population using representative data from 7,256 United Kingdom COVID-19 infection survey participants who had positive swab SARS-

	<p>CoV-2 PCR tests from 26-April-2020 to 14-June-2021...we estimated antibody levels associated with protection against reinfection likely last 1.5-2 years on average, with levels associated with protection from severe infection present for several years. These estimates could inform planning for vaccination booster strategies.”</p>
<p>30) Researchers find long-lived immunity to 1918 pandemic virus, CIDRAP, 2008</p> <p>and the actual 2008 NATURE journal publication by Yu</p>	<p>“A study of the blood of older people who survived the 1918 influenza pandemic reveals that antibodies to the strain have lasted a lifetime and can perhaps be engineered to protect future generations against similar strains...the group collected blood samples from 32 pandemic survivors aged 91 to 101..the people recruited for the study were 2 to 12 years old in 1918 and many recalled sick family members in their households, which suggests they were directly exposed to the virus, the authors report. The group found that 100% of the subjects had serum-neutralizing activity against the 1918 virus and 94% showed serologic reactivity to the 1918 hemagglutinin. The investigators generated B lymphoblastic cell lines from the peripheral blood mononuclear cells of eight subjects. Transformed cells from the blood of 7 of the 8 donors yielded secreting antibodies that bound the 1918 hemagglutinin.” Yu: “here we show that of the 32 individuals tested that were born in or before 1915, each showed sero-reactivity with the 1918 virus, nearly 90 years after the pandemic. Seven of the eight donor samples tested had circulating B cells that secreted antibodies that bound the 1918 HA. We isolated B cells from subjects and generated five monoclonal antibodies that showed potent neutralizing activity against 1918 virus from three separate donors. These antibodies also cross-reacted with the genetically similar HA of a 1930 swine H1N1 influenza strain.”</p>
<p>31) Live virus neutralisation testing in convalescent patients and subjects vaccinated against 19A, 20B, 20I/501Y.V1 and 20H/501Y.V2 isolates of SARS-CoV-2, Gonzalez, 2021</p>	<p>“No significant difference was observed between the 20B and 19A isolates for HCWs with mild COVID-19 and critical patients. However, a significant decrease in neutralisation ability was found for 20I/501Y.V1 in comparison with 19A isolate for critical patients and HCWs 6-months post infection. Concerning 20H/501Y.V2, all populations had a significant reduction in neutralising antibody titres in comparison with the 19A isolate. Interestingly, a significant difference in neutralisation capacity was observed for vaccinated HCWs between the two variants whereas it was not significant for the convalescent groups...the reduced neutralising response observed towards the 20H/501Y.V2</p>

	in comparison with the 19A and 20I/501Y.V1 isolates in fully immunized subjects with the BNT162b2 vaccine is a striking finding of the study.”
32) Differential effects of the second SARS-CoV-2 mRNA vaccine dose on T cell immunity in naïve and COVID-19 recovered individuals , Camara, 2021	“Characterized SARS-CoV-2 spike-specific humoral and cellular immunity in naïve and previously infected individuals during full BNT162b2 vaccination...results demonstrate that the second dose increases both the humoral and cellular immunity in naïve individuals. On the contrary, the second BNT162b2 vaccine dose results in a reduction of cellular immunity in COVID-19 recovered individuals.”
33) Op-Ed: Quit Ignoring Natural COVID Immunity , Klausner, 2021	“Epidemiologists estimate over 160 million people worldwide have recovered from COVID-19. Those who have recovered have an astonishingly low frequency of repeat infection, disease, or death.”
34) Association of SARS-CoV-2 Seropositive Antibody Test With Risk of Future Infection , Harvey, 2021	“To evaluate evidence of SARS-CoV-2 infection based on diagnostic nucleic acid amplification test (NAAT) among patients with positive vs negative test results for antibodies in an observational descriptive cohort study of clinical laboratory and linked claims data...the cohort included 3 257 478 unique patients with an index antibody test...patients with positive antibody test results were initially more likely to have positive NAAT results, consistent with prolonged RNA shedding, but became markedly less likely to have positive NAAT results over time, suggesting that seropositivity is associated with protection from infection.”
35) SARS-CoV-2 seropositivity and subsequent infection risk in healthy young adults: a prospective cohort study , Letizia, 2021	“Investigated the risk of subsequent SARS-CoV-2 infection among young adults (CHARM marine study) seropositive for a previous infection...enrolled 3249 participants, of whom 3168 (98%) continued into the 2-week quarantine period. 3076 (95%) participants...Among 189 seropositive participants, 19 (10%) had at least one positive PCR test for SARS-CoV-2 during the 6-week follow-up (1·1 cases per person-year). In contrast, 1079 (48%) of 2247 seronegative participants tested positive (6·2 cases per person-year). The incidence rate ratio was 0·18 (95% CI 0·11–0·28; p<0·001)...infected seropositive participants had viral loads that were about 10-times lower than those of infected seronegative participants (ORF1ab gene cycle threshold difference 3·95 [95% CI 1·23–6·67]; p=0·004).”

<p>36) <u>Associations of Vaccination and of Prior Infection With Positive PCR Test Results for SARS-CoV-2 in Airline Passengers Arriving in Qatar</u>, Bertollini, 2021</p>	<p>“Of 9,180 individuals with no record of vaccination but with a record of prior infection at least 90 days before the PCR test (group 3), 7694 could be matched to individuals with no record of vaccination or prior infection (group 2), among whom PCR positivity was 1.01% (95% CI, 0.80%-1.26%) and 3.81% (95% CI, 3.39%-4.26%), respectively. The relative risk for PCR positivity was 0.22 (95% CI, 0.17-0.28) for vaccinated individuals and 0.26 (95% CI, 0.21-0.34) for individuals with prior infection compared with no record of vaccination or prior infection.”</p>
<p>37) <u>Natural immunity against COVID-19 significantly reduces the risk of reinfection: findings from a cohort of sero-survey participants</u>, Mishra, 2021</p>	<p>“Followed up with a subsample of our previous sero-survey participants to assess whether natural immunity against SARS-CoV-2 was associated with a reduced risk of re-infection (India)... out of the 2238 participants, 1170 were sero-positive and 1068 were sero-negative for antibody against COVID-19. Our survey found that only 3 individuals in the sero-positive group got infected with COVID-19 whereas 127 individuals reported contracting the infection the sero-negative group...from the 3 sero-positives re-infected with COVID-19, one had hospitalization, but did not require oxygen support or critical care...development of antibody following natural infection not only protects against re-infection by the virus to a great extent, but also safeguards against progression to severe COVID-19 disease.”</p>
<p>38) <u>Lasting immunity found after recovery from COVID-19</u>, NIH, 2021</p>	<p>“The researchers found durable immune responses in the majority of people studied. Antibodies against the spike protein of SARS-CoV-2, which the virus uses to get inside cells, were found in 98% of participants one month after symptom onset. As seen in previous studies, the number of antibodies ranged widely between individuals. But, promisingly, their levels remained fairly stable over time, declining only modestly at 6 to 8 months after infection... virus-specific B cells increased over time. People had more memory B cells six months after symptom onset than at one month afterwards... levels of T cells for the virus also remained high after infection. Six months after symptom onset, 92% of participants had CD4+ T cells that recognized the virus... 95% of the people had at least 3 out of 5 immune-system components that could recognize SARS-CoV-2 up to 8 months after infection.”</p>

<p>39) <u>SARS-CoV-2 Natural Antibody Response Persists for at Least 12 Months in a Nationwide Study From the Faroe Islands</u>, Petersen, 2021</p>	<p>“The seropositive rate in the convalescent individuals was above 95% at all sampling time points for both assays and remained stable over time; that is, almost all convalescent individuals developed antibodies... results show that SARS-CoV-2 antibodies persisted at least 12 months after symptom onset and maybe even longer, indicating that COVID-19-convalescent individuals may be protected from reinfection.”</p>
<p>40) <u>SARS-CoV-2-specific T cell memory is sustained in COVID-19 convalescent patients for 10 months with successful development of stem cell-like memory T cells</u>, Jung, 2021</p>	<p>“ex vivo assays to evaluate SARS-CoV-2-specific CD4⁺ and CD8⁺ T cell responses in COVID-19 convalescent patients up to 317 days post-symptom onset (DPSO), and find that memory T cell responses are maintained during the study period regardless of the severity of COVID-19. In particular, we observe sustained polyfunctionality and proliferation capacity of SARS-CoV-2-specific T cells. Among SARS-CoV-2-specific CD4⁺ and CD8⁺ T cells detected by activation-induced markers, the proportion of stem cell-like memory T (T_{SCM}) cells is increased, peaking at approximately 120 DPSO.”</p>
<p>41) <u>Immune Memory in Mild COVID-19 Patients and Unexposed Donors Reveals Persistent T Cell Responses After SARS-CoV-2 Infection</u>, Ansari, 2021</p>	<p>“Analyzed 42 unexposed healthy donors and 28 mild COVID-19 subjects up to 5 months from the recovery for SARS-CoV-2 specific immunological memory. Using HLA class II predicted peptide megapools, we identified SARS-CoV-2 cross-reactive CD4⁺ T cells in around 66% of the unexposed individuals. Moreover, we found detectable immune memory in mild COVID-19 patients several months after recovery in the crucial arms of protective adaptive immunity; CD4⁺ T cells and B cells, with a minimal contribution from CD8⁺ T cells. Interestingly, the persistent immune memory in COVID-19 patients is predominantly targeted towards the Spike glycoprotein of the SARS-CoV-2. This study provides the evidence of both high magnitude pre-existing and persistent immune memory in Indian population.”</p>
<p>42) <u>COVID-19 natural immunity</u>, WHO, 2021</p>	<p>“Current evidence points to most individuals developing strong protective immune responses following natural infection with SARSCoV-2. Within 4 weeks following infection, 90-99% of individuals infected with the SARS-CoV-2 virus develop detectable neutralizing antibodies. The strength and duration of the immune responses to SARS-CoV-2 are not completely understood and currently available data suggests that it varies by age and the severity of symptoms. Available scientific data suggests that in most people immune responses</p>

	remain robust and protective against reinfection for at least 6-8 months after infection (the longest follow up with strong scientific evidence is currently approximately 8 months).”
43) Antibody Evolution after SARS-CoV-2 mRNA Vaccination , Cho, 2021	“We conclude that memory antibodies selected over time by natural infection have greater potency and breadth than antibodies elicited by vaccination...boosting vaccinated individuals with currently available mRNA vaccines would produce a quantitative increase in plasma neutralizing activity but not the qualitative advantage against variants obtained by vaccinating convalescent individuals.”
44) Humoral Immune Response to SARS-CoV-2 in Iceland , Gudbjartsson, 2020	“Measured antibodies in serum samples from 30,576 persons in Iceland...of the 1797 persons who had recovered from SARS-CoV-2 infection, 1107 of the 1215 who were tested (91.1%) were seropositive...results indicate risk of death from infection was 0.3% and that antiviral antibodies against SARS-CoV-2 did not decline within 4 months after diagnosis (para).”
45) Immunological memory to SARS-CoV-2 assessed for up to 8 months after infection , Dan, 2021	“Analyzed multiple compartments of circulating immune memory to SARS-CoV-2 in 254 samples from 188 COVID-19 cases, including 43 samples at ≥ 6 months post-infection...IgG to the Spike protein was relatively stable over 6+ months. Spike-specific memory B cells were more abundant at 6 months than at 1 month post symptom onset.”
46) The prevalence of adaptive immunity to COVID-19 and reinfection after recovery – a comprehensive systematic review and meta-analysis of 12 011 447 individuals , Chivese, 2021	“Fifty-four studies, from 18 countries, with a total of 12 011 447 individuals, followed up to 8 months after recovery, were included. At 6-8 months after recovery, the prevalence of detectable SARS-CoV-2 specific immunological memory remained high; IgG – 90.4%... pooled prevalence of reinfection was 0.2% (95%CI 0.0 – 0.7, $I^2 = 98.8$, 9 studies). Individuals who recovered from COVID-19 had an 81% reduction in odds of a reinfection (OR 0.19, 95% CI 0.1 – 0.3, $I^2 = 90.5\%$, 5 studies).”
47) Reinfection Rates among Patients who Previously Tested Positive for COVID-19: a Retrospective Cohort Study , Sheehan, 2021	“Retrospective cohort study of one multi-hospital health system included 150,325 patients tested for COVID-19 infection...prior infection in patients with COVID-19 was highly protective against reinfection and symptomatic disease. This protection increased over time, suggesting that viral shedding or ongoing

	immune response may persist beyond 90 days and may not represent true reinfection.”
48) Assessment of SARS-CoV-2 Reinfection 1 Year After Primary Infection in a Population in Lombardy, Italy , Vitale, 2020	“The study results suggest that reinfections are rare events and patients who have recovered from COVID-19 have a lower risk of reinfection. Natural immunity to SARS-CoV-2 appears to confer a protective effect for at least a year, which is similar to the protection reported in recent vaccine studies.”
49) Prior SARS-CoV-2 infection is associated with protection against symptomatic reinfection , Hanrath, 2021	“We observed no symptomatic reinfections in a cohort of healthcare workers...this apparent immunity to re-infection was maintained for at least 6 months...test positivity rates were 0% (0/128 [95% CI: 0–2.9]) in those with previous infection compared to 13.7% (290/2115 [95% CI: 12.3–15.2]) in those without ($P<0.0001$ χ^2 test).”
50) Targets of T Cell Responses to SARS-CoV-2 Coronavirus in Humans with COVID-19 Disease and Unexposed Individuals , Grifoni, 2020	“Using HLA class I and II predicted peptide “megapools,” circulating SARS-CoV-2-specific CD8 ⁺ and CD4 ⁺ T cells were identified in ~70% and 100% of COVID-19 convalescent patients, respectively. CD4 ⁺ T cell responses to spike, the main target of most vaccine efforts, were robust and correlated with the magnitude of the anti-SARS-CoV-2 IgG and IgA titers. The M, spike, and N proteins each accounted for 11%–27% of the total CD4 ⁺ response, with additional responses commonly targeting nsp3, nsp4, ORF3a, and ORF8, among others. For CD8 ⁺ T cells, spike and M were recognized, with at least eight SARS-CoV-2 ORFs targeted.”
51) NIH Director’s Blog: Immune T Cells May Offer Lasting Protection Against COVID-19 , Collins, 2021	“Much of the study on the immune response to SARS-CoV-2, the novel coronavirus that causes COVID-19, has focused on the production of antibodies . But, in fact, immune cells known as memory T cells also play an important role in the ability of our immune systems to protect us against many viral infections, including—it now appears—COVID-19. An intriguing new study of these memory T cells suggests they might protect some people newly infected with SARS-CoV-2 by remembering past encounters with other human coronaviruses . This might potentially explain why some people seem to fend off the virus and may be less susceptible to becoming severely ill with COVID-19.”

<p>52) <u>Ultrapotent antibodies against diverse and highly transmissible SARS-CoV-2 variants</u>, Wang, 2021</p>	<p>“Our study demonstrates that convalescent subjects previously infected with ancestral variant SARS-CoV-2 produce antibodies that cross-neutralize emerging VOCs with high potency...potent against 23 variants, including variants of concern.”</p>
<p>53) <u>Why COVID-19 Vaccines Should Not Be Required for All Americans</u>, Makary, 2021</p>	<p>“Requiring the vaccine in people who are already immune with natural immunity has no scientific support. While vaccinating those people may be beneficial – and it’s a reasonable hypothesis that vaccination may bolster the longevity of their immunity – to argue dogmatically that they <i>must</i> get vaccinated has zero clinical outcome data to back it. As a matter of fact, we have data to the contrary: A Cleveland Clinic <u>study</u> found that vaccinating people with natural immunity did not add to their level of protection.”</p>
<p>54) <u>Protracted yet coordinated differentiation of long-lived SARS-CoV-2-specific CD8+ T cells during COVID-19 convalescence</u>, Ma, 2021</p>	<p>“Screened 21 well-characterized, longitudinally-sampled convalescent donors that recovered from mild COVID-19...following a typical case of mild COVID-19, SARS-CoV-2-specific CD8+ T cells not only persist but continuously differentiate in a coordinated fashion well into convalescence, into a state characteristic of long-lived, self-renewing memory.”</p>
<p>55) <u>Decrease in Measles Virus-Specific CD4 T Cell Memory in Vaccinated Subjects</u>, Naniche, 2004</p>	<p>“Characterized the profiles of measles vaccine (MV) vaccine-induced antigen-specific T cells over time since vaccination. In a cross-sectional study of healthy subjects with a history of MV vaccination, we found that MV-specific CD4 and CD8 T cells could be detected up to 34 years after vaccination. The levels of MV-specific CD8 T cells and MV-specific IgG remained stable, whereas the level of MV-specific CD4 T cells decreased significantly in subjects who had been vaccinated >21 years earlier.”</p>
<p>56) <u>Remembrance of Things Past: Long-Term B Cell Memory After Infection and Vaccination</u>, Palm, 2019</p>	<p>“The success of vaccines is dependent on the generation and maintenance of immunological memory. The immune system can remember previously encountered pathogens, and memory B and T cells are critical in secondary responses to infection. Studies in mice have helped to understand how different memory B cell populations are generated following antigen exposure and how affinity for the antigen is determinant to B cell fate... upon re-exposure to an antigen the memory recall response will be faster, stronger, and more specific than a naïve response. Protective memory depends first on</p>

	<p>circulating antibodies secreted by LLPCs. When these are not sufficient for immediate pathogen neutralization and elimination, memory B cells are recalled.”</p>
<p>57) SARS-CoV-2 specific memory B-cells from individuals with diverse disease severities recognize SARS-CoV-2 variants of concern, Lyski, 2021</p>	<p>“Examined the magnitude, breadth, and durability of SARS-CoV-2 specific antibodies in two distinct B-cell compartments: long-lived plasma cell-derived antibodies in the plasma, and peripheral memory B-cells along with their associated antibody profiles elicited after <i>in vitro</i> stimulation. We found that magnitude varied amongst individuals, but was the highest in hospitalized subjects. Variants of concern (VoC) -RBD-reactive antibodies were found in the plasma of 72% of samples in this investigation, and VoC-RBD-reactive memory B-cells were found in all but 1 subject at a single time-point. This finding, that VoC-RBD-reactive MBCs are present in the peripheral blood of all subjects including those that experienced asymptomatic or mild disease, provides a reason for optimism regarding the capacity of vaccination, prior infection, and/or both, to limit disease severity and transmission of variants of concern as they continue to arise and circulate.”</p>
<p>58) Exposure to SARS-CoV-2 generates T-cell memory in the absence of a detectable viral infection, Wang, 2021</p>	<p>“T-cell immunity is important for recovery from COVID-19 and provides heightened immunity for re-infection. However, little is known about the SARS-CoV-2-specific T-cell immunity in virus-exposed individuals...report virus-specific CD4⁺ and CD8⁺ T-cell memory in recovered COVID-19 patients and close contacts...close contacts are able to gain T-cell immunity against SARS-CoV-2 despite lacking a detectable infection.”</p>
<p>59) CD8+ T-Cell Responses in COVID-19 Convalescent Individuals Target Conserved Epitopes From Multiple Prominent SARS-CoV-2 Circulating Variants, Redd, 2021 and Lee, 2021</p>	<p>“The CD4 and CD8 responses generated after natural infection are equally robust, showing activity against multiple “epitopes” (little segments) of the spike protein of the virus. For instance, CD8 cells responds to 52 epitopes and CD4 cells respond to 57 epitopes across the spike protein, so that a few mutations in the variants cannot knock out such a robust and in-breadth T cell response...only 1 mutation found in Beta variant-spike overlapped with a previously identified epitope (1/52), suggesting that virtually all anti-SARS-CoV-2 CD8+ T-cell responses should recognize these newly described variants.”</p>

<p>60) Exposure to common cold coronaviruses can teach the immune system to recognize SARS-CoV-2, La Jolla, Crotty and Sette, 2020</p>	<p>“Exposure to common cold coronaviruses can teach the immune system to recognize SARS-CoV-2”</p>
<p>61) Selective and cross-reactive SARS-CoV-2 T cell epitopes in unexposed humans, Mateus, 2020</p>	<p>“Found that the pre-existing reactivity against SARS-CoV-2 comes from memory T cells and that cross-reactive T cells can specifically recognize a SARS-CoV-2 epitope as well as the homologous epitope from a common cold coronavirus. These findings underline the importance of determining the impacts of pre-existing immune memory in COVID-19 disease severity.”</p>
<p>62) Longitudinal observation of antibody responses for 14 months after SARS-CoV-2 infection, Dehgani-Mobaraki, 2021</p>	<p>“Better understanding of antibody responses against SARS-CoV-2 after natural infection might provide valuable insights into the future implementation of vaccination policies. Longitudinal analysis of IgG antibody titers was carried out in 32 recovered COVID-19 patients based in the Umbria region of Italy for 14 months after Mild and Moderately-Severe infection...study findings are consistent with recent studies reporting antibody persistency suggesting that induced SARS-CoV-2 immunity through natural infection, might be very efficacious against re-infection (>90%) and could persist for more than six months. Our study followed up patients up to 14 months demonstrating the presence of anti-S-RBD IgG in 96.8% of recovered COVID-19 subjects.”</p>
<p>63) Humoral and circulating follicular helper T cell responses in recovered patients with COVID-19, Juno, 2020</p>	<p>“Characterized humoral and circulating follicular helper T cell (cTFH) immunity against spike in recovered patients with coronavirus disease 2019 (COVID-19). We found that S-specific antibodies, memory B cells and cTFH are consistently elicited after SARS-CoV-2 infection, demarking robust humoral immunity and positively associated with plasma neutralizing activity.”</p>
<p>64) Convergent antibody responses to SARS-CoV-2 in convalescent individuals, Robbiani, 2020</p>	<p>“149 COVID-19-convalescent individuals...antibody sequencing revealed the expansion of clones of RBD-specific memory B cells that expressed closely related antibodies in different individuals. Despite low plasma titres, antibodies to three distinct epitopes on the RBD neutralized the virus with half-maximal inhibitory concentrations (IC₅₀ values) as low as 2 ng ml⁻¹.”</p>

65) Rapid generation of durable B cell memory to SARS-CoV-2 spike and nucleocapsid proteins in COVID-19 and convalescence , Hartley, 2020	“COVID-19 patients rapidly generate B cell memory to both the spike and nucleocapsid antigens following SARS-CoV-2 infection...RBD- and NCP-specific IgG and Bmem cells were detected in all 25 patients with a history of COVID-19.”
66) Had COVID? You’ll probably make antibodies for a lifetime , Callaway, 2021	“People who recover from mild COVID-19 have bone-marrow cells that can churn out antibodies for decades...the study provides evidence that immunity triggered by SARS-CoV-2 infection will be extraordinarily long-lasting.”
67) A majority of uninfected adults show preexisting antibody reactivity against SARS-CoV-2 , Majdoubi, 2021	In greater Vancouver Canada, “using a highly sensitive multiplex assay and positive/negative thresholds established in infants in whom maternal antibodies have waned, we determined that more than 90% of uninfected adults showed antibody reactivity against the spike protein, receptor-binding domain (RBD), N-terminal domain (NTD), or the nucleocapsid (N) protein from SARS-CoV-2.”
68) SARS-CoV-2-reactive T cells in healthy donors and patients with COVID-19 , Braun, 2020 Presence of SARS-CoV-2-reactive T cells in COVID-19 patients and healthy donors , Braun, 2020	“The results indicate that spike-protein cross-reactive T cells are present, which were probably generated during previous encounters with endemic coronaviruses.” “The presence of pre-existing SARS-CoV-2-reactive T cells in a subset of SARS-CoV-2 naïve HD is of high interest.”
69) Naturally enhanced neutralizing breadth against SARS-CoV-2 one year after infection , Wang, 2021	“A cohort of 63 individuals who have recovered from COVID-19 assessed at 1.3, 6.2 and 12 months after SARS-CoV-2 infection...the data suggest that immunity in convalescent individuals will be very long lasting.”
70) One Year after Mild COVID-19: The Majority of Patients Maintain Specific Immunity, But One in Four Still Suffer from Long-Term Symptoms , Rank, 2021	“Long-lasting immunological memory against SARS-CoV-2 after mild COVID-19... activation-induced marker assays identified specific T-helper cells and central memory T-cells in 80% of participants at a 12-month follow-up.”
71) IDSA , 2021	“Immune responses to SARS-CoV-2 following natural infection can persist for at least 11 months... natural infection (as determined by a prior positive antibody or PCR-test result) can confer protection against SARS-CoV-2 infection.”
72) Assessment of protection against reinfection with SARS-CoV-2 among 4 million PCR-tested individuals in Denmark in	Denmark, “during the first surge (ie, before June, 2020), 533 381 people were tested, of whom 11 727 (2·20%) were PCR positive, and 525 339 were eligible for

<p><u>2020: a population-level observational study</u>, Holm Hansen, 2021</p>	<p>follow-up in the second surge, of whom 11 068 (2·11%) had tested positive during the first surge. Among eligible PCR-positive individuals from the first surge of the epidemic, 72 (0·65% [95% CI 0·51–0·82]) tested positive again during the second surge compared with 16 819 (3·27% [3·22–3·32]) of 514 271 who tested negative during the first surge (adjusted RR 0·195 [95% CI 0·155–0·246]).”</p>
<p>73) <u>Antigen-Specific Adaptive Immunity to SARS-CoV-2 in Acute COVID-19 and Associations with Age and Disease Severity</u>, Moderbacher, 2020</p>	<p>“Adaptive immune responses limit COVID-19 disease severity...multiple coordinated arms of adaptive immunity control better than partial responses...completed a combined examination of all three branches of adaptive immunity at the level of SARS-CoV-2-specific CD4⁺ and CD8⁺ T cell and neutralizing antibody responses in acute and convalescent subjects. SARS-CoV-2-specific CD4⁺ and CD8⁺ T cells were each associated with milder disease. Coordinated SARS-CoV-2-specific adaptive immune responses were associated with milder disease, suggesting roles for both CD4⁺ and CD8⁺ T cells in protective immunity in COVID-19.”</p>
<p>74) <u>Detection of SARS-CoV-2-Specific Humoral and Cellular Immunity in COVID-19 Convalescent Individuals</u>, Ni, 2020</p>	<p>“Collected blood from COVID-19 patients who have recently become virus-free, and therefore were discharged, and detected SARS-CoV-2-specific humoral and cellular immunity in eight newly discharged patients. Follow-up analysis on another cohort of six patients 2 weeks post discharge also revealed high titers of immunoglobulin G (IgG) antibodies. In all 14 patients tested, 13 displayed serum-neutralizing activities in a pseudotype entry assay. Notably, there was a strong correlation between neutralization antibody titers and the numbers of virus-specific T cells.”</p>
<p>75) <u>Robust SARS-CoV-2-specific T-cell immunity is maintained at 6 months following primary infection</u>, Zuo, 2020</p>	<p>“Analysed the magnitude and phenotype of the SARS-CoV-2 cellular immune response in 100 donors at six months following primary infection and related this to the profile of antibody level against spike, nucleoprotein and RBD over the previous six months. T-cell immune responses to SARS-CoV-2 were present by ELISPOT and/or ICS analysis in all donors and are characterised by predominant CD4⁺ T cell responses with strong IL-2 cytokine expression... functional SARS-CoV-2-specific T-cell responses are retained at six months following infection.”</p>

<p>76) <u>Negligible impact of SARS-CoV-2 variants on CD4⁺ and CD8⁺ T cell reactivity in COVID-19 exposed donors and vaccinees</u>, Tarke, 2021</p>	<p>“Performed a comprehensive analysis of SARS-CoV-2-specific CD4⁺ and CD8⁺ T cell responses from COVID-19 convalescent subjects recognizing the ancestral strain, compared to variant lineages B.1.1.7, B.1.351, P.1, and CAL.20C as well as recipients of the Moderna (mRNA-1273) or Pfizer/BioNTech (BNT162b2) COVID-19 vaccines... the sequences of the vast majority of SARS-CoV-2 T cell epitopes are not affected by the mutations found in the variants analyzed. Overall, the results demonstrate that CD4⁺ and CD8⁺ T cell responses in convalescent COVID-19 subjects or COVID-19 mRNA vaccinees are not substantially affected by mutations.”</p>
<p>77) <u>A 1 to 1000 SARS-CoV-2 reinfection proportion in members of a large healthcare provider in Israel: a preliminary report</u>, Perez, 2021</p>	<p>Israel, “out of 149,735 individuals with a documented positive PCR test between March 2020 and January 2021, 154 had two positive PCR tests at least 100 days apart, reflecting a reinfection proportion of 1 per 1000.”</p>
<p>78) <u>Persistence and decay of human antibody responses to the receptor binding domain of SARS-CoV-2 spike protein in COVID-19 patients</u>, Iyer, 2020</p>	<p>“Measured plasma and/or serum antibody responses to the receptor-binding domain (RBD) of the spike (S) protein of SARS-CoV-2 in 343 North American patients infected with SARS-CoV-2 (of which 93% required hospitalization) up to 122 days after symptom onset and compared them to responses in 1548 individuals whose blood samples were obtained prior to the pandemic...IgG antibodies persisted at detectable levels in patients beyond 90 days after symptom onset, and seroreversion was only observed in a small percentage of individuals. The concentration of these anti-RBD IgG antibodies was also highly correlated with pseudovirus NAb titers, which also demonstrated minimal decay. The observation that IgG and neutralizing antibody responses persist is encouraging, and suggests the development of robust systemic immune memory in individuals with severe infection.”</p>
<p>79) <u>A population-based analysis of the longevity of SARS-CoV-2 antibody seropositivity in the United States</u>, Alfego, 2021</p>	<p>“To track population-based SARS-CoV-2 antibody seropositivity duration across the United States using observational data from a national clinical laboratory registry of patients tested by nucleic acid amplification (NAAT) and serologic assays... specimens from 39,086 individuals with confirmed positive COVID-19...both S and N SARS-CoV-2 antibody results offer an encouraging view of how long humans may have protective antibodies against COVID-19, with curve smoothing showing population seropositivity reaching 90% within three weeks, regardless of whether the assay detects N or S-antibodies. Most</p>

	importantly, this level of seropositivity was sustained with little decay through ten months after initial positive PCR.”
80) What are the roles of antibodies versus a durable, high-quality T-cell response in protective immunity against SARS-CoV-2? Hellerstein, 2020	“Progress in laboratory markers for SARS-CoV2 has been made with identification of epitopes on CD4 and CD8 T-cells in convalescent blood. These are much less dominated by spike protein than in previous coronavirus infections. Although most vaccine candidates are focusing on spike protein as antigen, natural infection by SARS-CoV-2 induces broad epitope coverage, cross-reactive with other betacoronaviruses.”
81) Broad and strong memory CD4⁺ and CD8⁺ T cells induced by SARS-CoV-2 in UK convalescent COVID-19 patients , Peng, 2020	“Study of 42 patients following recovery from COVID-19, including 28 mild and 14 severe cases, comparing their T cell responses to those of 16 control donors...found the breadth, magnitude and frequency of memory T cell responses from COVID-19 were significantly higher in severe compared to mild COVID-19 cases, and this effect was most marked in response to spike, membrane, and ORF3a proteins...total and spike-specific T cell responses correlated with the anti-Spike, anti-Receptor Binding Domain (RBD) as well as anti-Nucleoprotein (NP) endpoint antibody titre...furthermore showed a higher ratio of SARS-CoV-2-specific CD8 ⁺ to CD4 ⁺ T cell responses...immunodominant epitope clusters and peptides containing T cell epitopes identified in this study will provide critical tools to study the role of virus-specific T cells in control and resolution of SARS-CoV-2 infections.”
82) Robust T Cell Immunity in Convalescent Individuals with Asymptomatic or Mild COVID-19 , Sekine, 2020	“SARS-CoV-2-specific memory T cells will likely prove critical for long-term immune protection against COVID-19...mapped the functional and phenotypic landscape of SARS-CoV-2-specific T cell responses in unexposed individuals, exposed family members, and individuals with acute or convalescent COVID-19...collective dataset shows that SARS-CoV-2 elicits broadly directed and functionally replete memory T cell responses, suggesting that natural exposure or infection may prevent recurrent episodes of severe COVID-19.”
83) Potent SARS-CoV-2-Specific T Cell Immunity and Low Anaphylatoxin Levels Correlate With Mild Disease Progression in COVID-19 Patients , Lafron, 2021	“Provide a full picture of cellular and humoral immune responses of COVID-19 patients and prove that robust polyfunctional CD8 ⁺ T cell responses concomitant with low anaphylatoxin levels correlate with mild infections.”

<p>84) <u>SARS-CoV-2 T-cell epitopes define heterologous and COVID-19 induced T-cell recognition</u>, Nelde, 2020</p>	<p>“The first work identifying and characterizing SARS-CoV-2-specific and cross-reactive HLA class I and HLA-DR T-cell epitopes in SARS-CoV-2 convalescents (n = 180) as well as unexposed individuals (n = 185) and confirming their relevance for immunity and COVID-19 disease course...cross-reactive SARS-CoV-2 T-cell epitopes revealed pre-existing T-cell responses in 81% of unexposed individuals, and validation of similarity to common cold human coronaviruses provided a functional basis for postulated heterologous immunity in SARS-CoV-2 infection...intensity of T-cell responses and recognition rate of T-cell epitopes was significantly higher in the convalescent donors compared to unexposed individuals, suggesting that not only expansion, but also diversity spread of SARS-CoV-2 T-cell responses occur upon active infection.”</p>
<p>85) <u>Karl Friston: up to 80% not even susceptible to Covid-19</u>, Sayers, 2020</p>	<p>“Results have just been published of a study suggesting that 40%-60% of people who have not been exposed to coronavirus have resistance at the T-cell level from other similar coronaviruses like the common cold...the true portion of people who are not even susceptible to Covid-19 may be as high as 80%.”</p>
<p>86) <u>CD8⁺ T cells specific for an immunodominant SARS-CoV-2 nucleocapsid epitope cross-react with selective seasonal coronaviruses</u>, Lineburg, 2021</p>	<p>“Screening of SARS-CoV-2 peptide pools revealed that the nucleocapsid (N) protein induced an immunodominant response in HLA-B7⁺ COVID-19-recovered individuals that was also detectable in unexposed donors...the basis of selective T cell cross-reactivity for an immunodominant SARS-CoV-2 epitope and its homologs from seasonal coronaviruses, suggesting long-lasting protective immunity.”</p>
<p>87) <u>SARS-CoV-2 genome-wide mapping of CD8 T cell recognition reveals strong immunodominance and substantial CD8 T cell activation in COVID-19 patients</u>, Saini, 2020</p>	<p>“COVID-19 patients showed strong T cell responses, with up to 25% of all CD8⁺ lymphocytes specific to SARS-CoV-2-derived immunodominant epitopes, derived from ORF1 (open reading frame 1), ORF3, and Nucleocapsid (N) protein. A strong signature of T cell activation was observed in COVID-19 patients, while no T cell activation was seen in the ‘non-exposed’ and ‘high exposure risk’ healthy donors.”</p>
<p>88) <u>Equivalency of Protection from Natural Immunity in COVID-19 Recovered Versus Fully Vaccinated Persons: A Systematic Review and Pooled Analysis</u>, Shenai, 2021</p>	<p>“Systematic review and pooled analysis of clinical studies to date, that (1) specifically compare the protection of natural immunity in the COVID-recovered versus the efficacy of full vaccination in the COVID-naive, and (2) the added benefit of vaccination in the COVID-recovered, for prevention of</p>

	subsequent SARS-CoV-2 infection...review demonstrates that natural immunity in COVID-recovered individuals is, at least, equivalent to the protection afforded by full vaccination of COVID-naïve populations. There is a modest and incremental relative benefit to vaccination in COVID-recovered individuals; however, the net benefit is marginal on an absolute basis.”
89) ChAdOx1nCoV-19 effectiveness during an unprecedented surge in SARS CoV-2 infections , Satwik, 2021	“The third key finding is that previous infections with SARS-CoV-2 were significantly protective against all studied outcomes, with an effectiveness of 93% (87 to 96%) seen against symptomatic infections, 89% (57 to 97%) against moderate to severe disease and 85% (-9 to 98%) against supplemental oxygen therapy. All deaths occurred in previously uninfected individuals. This was higher protection than that offered by single or double dose vaccine.”
90) SARS-CoV-2 specific T cells and antibodies in COVID-19 protection: a prospective study , Molodtsov, 2021	“Explore the impact of T cells and to quantify the protective levels of the immune responses...5,340 Moscow residents were evaluated for the antibody and cellular immune responses to SARS-CoV-2 and monitored for COVID-19 up to 300 days. The antibody and cellular responses were tightly interconnected, their magnitude inversely correlated with infection probability. Similar maximal level of protection was reached by individuals positive for both types of responses and by individuals with antibodies alone...T cells in the absence of antibodies provided an intermediate level of protection.”
91) Anti- SARS-CoV-2 Receptor Binding Domain Antibody Evolution after mRNA Vaccination , Cho, 2021	“SARS-CoV-2 infection produces B-cell responses that continue to evolve for at least one year. During that time, memory B cells express increasingly broad and potent antibodies that are resistant to mutations found in variants of concern.”
92) Seven-month kinetics of SARS-CoV-2 antibodies and role of pre-existing antibodies to human coronaviruses , Ortega, 2021	“Impact of pre-existing antibodies to human coronaviruses causing common cold (HCoVs), is essential to understand protective immunity to COVID-19 and devise effective surveillance strategies...after the peak response, anti-spike antibody levels increase from ~150 days post-symptom onset in all individuals (73% for IgG), in the absence of any evidence of re-exposure. IgG and IgA to HCoV are significantly higher in asymptomatic than symptomatic seropositive individuals. Thus, pre-existing cross-reactive HCoVs antibodies could have a protective effect against SARS-CoV-2 infection and COVID-19 disease.”

93) <u>Immunodominant T-cell epitopes from the SARS-CoV-2 spike antigen reveal robust pre-existing T-cell immunity in unexposed individuals</u> , Mahajan, 2021	“Findings suggest that SARS-CoV-2 reactive T-cells are likely to be present in many individuals because of prior exposure to flu and CMV viruses.”
94) <u>Neutralizing Antibody Responses to Severe Acute Respiratory Syndrome Coronavirus 2 in Coronavirus Disease 2019 Inpatients and Convalescent Patients</u> , Wang, 2020	“117 blood samples were collected from 70 COVID-19 inpatients and convalescent patients...the neutralizing antibodies were detected even at the early stage of disease, and a significant response was shown in convalescent patients.”
95) <u>Not just antibodies: B cells and T cells mediate immunity to COVID-19</u> , Cox, 2020	“Reports that antibodies to SARS-CoV-2 are not maintained in the serum following recovery from the virus have caused alarm...the absence of specific antibodies in the serum does not necessarily mean an absence of immune memory.”
96) <u>T cell immunity to SARS-CoV-2 following natural infection and vaccination</u> , DiPiazza, 2020	“Although T cell durability to SARS-CoV-2 remains to be determined, current data and past experience from human infection with other CoVs demonstrate the potential for persistence and the capacity to control viral replication and host disease, and importance in vaccine-induced protection.”
97) <u>Durable SARS-CoV-2 B cell immunity after mild or severe disease</u> , Ogega, 2021	“Multiple studies have shown loss of severe acute respiratory syndrome coronavirus 2-specific (SARS-CoV-2-specific) antibodies over time after infection, raising concern that humoral immunity against the virus is not durable. If immunity wanes quickly, millions of people may be at risk for reinfection after recovery from coronavirus disease 2019 (COVID-19). However, memory B cells (MBCs) could provide durable humoral immunity even if serum neutralizing antibody titers decline... data indicate that most SARS-CoV-2-infected individuals develop S-RBD-specific, class-switched rMBCs that resemble germinal center-derived B cells induced by effective vaccination against other pathogens, providing evidence for durable B cell-mediated immunity against SARS-CoV-2 after mild or severe disease.”
98) <u>Memory T cell responses targeting the SARS coronavirus persist up to 11 years post-infection.</u> , Ng, 2016	“All memory T cell responses detected target the SARS-Co-V structural proteins... these responses were found to persist up to 11 years post-infection... knowledge of the persistence of SARS-specific cellular immunity

	targeting the viral structural proteins in SARS-recovered individuals is important.”
99) Adaptive immunity to SARS-CoV-2 and COVID-19 , Sette, 2021	“The adaptive immune system is important for control of most viral infections. The three fundamental components of the adaptive immune system are B cells (the source of antibodies), CD4+ T cells, and CD8+ T cells...a picture has begun to emerge that reveals that CD4+ T cells, CD8+ T cells, and neutralizing antibodies all contribute to control of SARS-CoV-2 in both non-hospitalized and hospitalized cases of COVID-19.”
100) Early induction of functional SARS-CoV-2-specific T cells associates with rapid viral clearance and mild disease in COVID-19 patients , Tan, 2021	“These findings provide support for the prognostic value of early functional SARS-CoV-2-specific T cells with important implications in vaccine design and immune monitoring.”
101) SARS-CoV-2-specific CD8+ T cell responses in convalescent COVID-19 individuals , Kared, 2021	“A multiplexed peptide-MHC tetramer approach was used to screen 408 SARS-CoV-2 candidate epitopes for CD8+ T cell recognition in a cross-sectional sample of 30 coronavirus disease 2019 convalescent individuals...Modelling demonstrated a coordinated and dynamic immune response characterized by a decrease in inflammation, increase in neutralizing antibody titer, and differentiation of a specific CD8+ T cell response. Overall, T cells exhibited distinct differentiation into stem cell and transitional memory states (subsets), which may be key to developing durable protection.”
102) S Protein-Reactive IgG and Memory B Cell Production after Human SARS-CoV-2 Infection Includes Broad Reactivity to the S2 Subunit , Nguyen-Contant, 2021	“Most importantly, we demonstrate that infection generates both IgG and IgG MBCs against the novel receptor binding domain and the conserved S2 subunit of the SARS-CoV-2 spike protein. Thus, even if antibody levels wane, long-lived MBCs remain to mediate rapid antibody production. Our study results also suggest that SARS-CoV-2 infection strengthens pre-existing broad coronavirus protection through S2-reactive antibody and MBC formation.”
103) Persistence of Antibody and Cellular Immune Responses in Coronavirus Disease 2019 Patients Over Nine Months After Infection , Yao, 2021	“A cross-sectional study to assess the virus-specific antibody and memory T and B cell responses in coronavirus disease 2019 (COVID-19) patients up to 343 days after infection...found that approximately 90% of patients still have detectable immunoglobulin (Ig)G antibodies against spike and nucleocapsid proteins and neutralizing antibodies against pseudovirus, whereas ~60% of

	<p>patients had detectable IgG antibodies against receptor-binding domain and surrogate virus-neutralizing antibodies...SARS-CoV-2-specific IgG+ memory B cell and interferon-γ-secreting T cell responses were detectable in more than 70% of patients...coronavirus 2-specific immune memory response persists in most patients approximately 1 year after infection, which provides a promising sign for prevention from reinfection and vaccination strategy.”</p>
<p>104) Naturally Acquired SARS-CoV-2 Immunity Persists for Up to 11 Months Following Infection, De Giorgi, 2021</p>	<p>“A prospective, longitudinal analysis of COVID-19 convalescent plasma donors at multiple time points over an 11-month period to determine how circulating antibody levels change over time following natural infection... data suggest that immunological memory is acquired in most individuals infected with SARS-CoV-2 and is sustained in a majority of patients.”</p>
<p>105) Decreasing Seroprevalence of Measles Antibodies after Vaccination – Possible Gap in Measles Protection in Adults in the Czech Republic, Smetana, 2017</p>	<p>“A long-term high rate of seropositivity persists after natural measles infection. By contrast, it decreases over time after vaccination. Similarly, the concentrations of antibodies in persons with measles history persist for a longer time at a higher level than in vaccinated persons.”</p>
<p>106) Broadly cross-reactive antibodies dominate the human B cell response against 2009 pandemic H1N1 influenza virus infection, Wrammert, 2011</p>	<p>“The expansion of these rare types of memory B cells may explain why most people did not become severely ill, even in the absence of pre-existing protective antibody titers”...found “extraordinarily” powerful antibodies in the blood of nine people who caught the swine flu naturally and recovered from it.”...unlike antibodies elicited by annual influenza vaccinations, most neutralizing antibodies induced by pandemic H1N1 infection were broadly cross-reactive against epitopes in the hemagglutinin (HA) stalk and head domain of multiple influenza strains. The antibodies were from cells that had undergone extensive affinity maturation.”</p>
<p>107) Reinfection With Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) in Patients Undergoing Serial Laboratory Testing, Qureshi, 2021</p>	<p>“Reinfection was identified in 0.7% (n = 63, 95% confidence interval [CI]: .5%–.9%) during follow-up of 9119 patients with SARS-CoV-2 infection.”</p>
<p>108) Distinct antibody and memory B cell responses in SARS-CoV-2 naïve and recovered individuals following mRNA vaccination, Goel, 2021</p>	<p>“Interrogated antibody and antigen-specific memory B cells over time in 33 SARS-CoV-2 naïve and 11 SARS-CoV-2 recovered subjects... In SARS-CoV-2 recovered individuals, antibody and memory B cell responses were significantly</p>

	<p>boosted after the first vaccine dose; however, there was no increase in circulating antibodies, neutralizing titers, or antigen-specific memory B cells after the second dose. This robust boosting after the first vaccine dose strongly correlated with levels of pre-existing memory B cells in recovered individuals, identifying a key role for memory B cells in mounting recall responses to SARS-CoV-2 antigens.”</p>
<p>109) Covid-19: Do many people have pre-existing immunity? Doshi, 2020</p>	<p>“Six studies have reported T cell reactivity against SARS-CoV-2 in 20% to 50% of people with no known exposure to the virus... in a study of donor blood specimens obtained in the US between 2015 and 2018, 50% displayed various forms of T cell reactivity to SARS-CoV-2... Researchers are also confident that they have made solid inroads into ascertaining the origins of the immune responses. “Our hypothesis, of course, was that it’s so called ‘common cold’ coronaviruses, because they’re closely related...we have really shown that this is a true immune memory and it is derived in part from common cold viruses.”</p>
<p>110) Pre-existing and <i>de novo</i> humoral immunity to SARS-CoV-2 in humans, Ng, 2020</p>	<p>“We demonstrate the presence of pre-existing humoral immunity in uninfected and unexposed humans to the new coronavirus. SARS-CoV-2 S-reactive antibodies were readily detectable by a sensitive flow cytometry-based method in SARS-CoV-2-uninfected individuals and were particularly prevalent in children and adolescents.”</p>
<p>111) Phenotype of SARS-CoV-2-specific T-cells in COVID-19 patients with acute respiratory distress syndrome, Weiskopf, 2020</p>	<p>“We detected SARS-CoV-2-specific CD4⁺ and CD8⁺ T cells in 100% and 80% of COVID-19 patients, respectively. We also detected low levels of SARS-CoV-2-reactive T-cells in 20% of the healthy controls, not previously exposed to SARS-CoV-2 and indicative of cross-reactivity due to infection with ‘common cold’ coronaviruses.”</p>
<p>112) Pre-existing immunity to SARS-CoV-2: the knowns and unknowns, Sette, 2020</p>	<p>“T cell reactivity against SARS-CoV-2 was observed in unexposed people...it is speculated that this reflects T cell memory to circulating ‘common cold’ coronaviruses.”</p>
<p>113) Pre-existing immunity against swine-origin H1N1 influenza viruses in the general human population, Greenbaum, 2009</p>	<p>“Memory T-cell immunity against S-OIV is present in the adult population and that such memory is of similar magnitude as the pre-existing memory against seasonal H1N1 influenza...the conservation of a large fraction of T-cell epitopes</p>

	suggests that the severity of an S-OIV infection, as far as it is determined by susceptibility of the virus to immune attack, would not differ much from that of seasonal flu.”
114) Cellular immune correlates of protection against symptomatic pandemic influenza , Sridhar, 2013	“The 2009 H1N1 pandemic (pH1N1) provided a unique natural experiment to determine whether cross-reactive cellular immunity limits symptomatic illness in antibody-naïve individuals... Higher frequencies of pre-existing T cells to conserved CD8 epitopes were found in individuals who developed less severe illness, with total symptom score having the strongest inverse correlation with the frequency of interferon- γ (IFN- γ)(+) interleukin-2 (IL-2)(-) CD8(+) T cells ($r = -0.6$, $P = 0.004$)... CD8(+) T cells specific to conserved viral epitopes correlated with cross-protection against symptomatic influenza.”
115) Preexisting influenza-specific CD4+ T cells correlate with disease protection against influenza challenge in humans , Wilkinson, 2012	“Precise role of T cells in human influenza immunity is uncertain. We conducted influenza infection studies in healthy volunteers with no detectable antibodies to the challenge viruses H3N2 or H1N1...mapped T cell responses to influenza before and during infection...found a large increase in influenza-specific T cell responses by day 7, when virus was completely cleared from nasal samples and serum antibodies were still undetectable. Pre-existing CD4+, but not CD8+, T cells responding to influenza internal proteins were associated with lower virus shedding and less severe illness. These CD4+ cells also responded to pandemic H1N1 (A/CA/07/2009) peptides and showed evidence of cytotoxic activity.”
116) Serum cross-reactive antibody response to a novel influenza A (H1N1) virus after vaccination with seasonal influenza vaccine , CDC, MMWR, 2009	“No increase in cross-reactive antibody response to the novel influenza A (H1N1) virus was observed among adults aged >60 years. These data suggest that receipt of recent (2005–2009) seasonal influenza vaccines is unlikely to elicit a protective antibody response to the novel influenza A (H1N1) virus.”
117) No one is naive: the significance of heterologous T-cell immunity , Welsh, 2002	“Memory T cells that are specific for one virus can become activated during infection with an unrelated heterologous virus, and might have roles in protective immunity and immunopathology. The course of each infection is influenced by the T-cell memory pool that has been laid down by a host’s history of previous infections, and with each successive infection, T-cell memory to previously encountered agents is modified.”

<p>118) <u>Intrafamilial Exposure to SARS-CoV-2 Induces Cellular Immune Response without Seroconversion</u>, Gallais, 2020</p>	<p>“Individuals belonging to households with an index COVID-19 patient, reported symptoms of COVID-19 but discrepant serology results... All index patients recovered from a mild COVID-19. They all developed anti-SARS-CoV-2 antibodies and a significant T cell response detectable up to 69 days after symptom onset. Six of the eight contacts reported COVID-19 symptoms within 1 to 7 days after the index patients but all were SARS-CoV-2 seronegative... exposure to SARS-CoV-2 can induce virus-specific T cell responses without seroconversion. T cell responses may be more sensitive indicators of SARS-CoV-2 exposure than antibodies...results indicate that epidemiological data relying only on the detection of SARS-CoV-2 antibodies may lead to a substantial underestimation of prior exposure to the virus.”</p>
<p>119) <u>Protective immunity after recovery from SARS-CoV-2 infection</u>, Kojima, 2021</p>	<p>“It important to note that antibodies are incomplete predictors of protection. After vaccination or infection, many mechanisms of immunity exist within an individual not only at the antibody level, but also at the level of cellular immunity. It is known that SARS-CoV-2 infection induces specific and durable T-cell immunity, which has multiple SARS-CoV-2 spike protein targets (or epitopes) as well as other SARS-CoV-2 protein targets. The broad diversity of T-cell viral recognition serves to enhance protection to SARS-CoV-2 variants, with recognition of at least the alpha (B.1.1.7), beta (B.1.351), and gamma (P.1) variants of SARS-CoV-2. Researchers have also found that people who recovered from SARS-CoV infection in 2002–03 continue to have memory T cells that are reactive to SARS-CoV proteins 17 years after that outbreak. Additionally, a memory B-cell response to SARS-CoV-2 evolves between 1·3 and 6·2 months after infection, which is consistent with longer-term protection.”</p>
<p>120) <u>This ‘super antibody’ for COVID fights off multiple coronaviruses</u>, Kwon, 2021</p>	<p>“This ‘super antibody’ for COVID fights off multiple coronaviruses...12 antibodies...that was involved in the study, isolated from people who had been infected with either SARS-CoV-2 or its close relative SARS-CoV.”</p>
<p>121) <u>SARS-CoV-2 infection induces sustained humoral immune responses in convalescent patients following symptomatic COVID-19</u>, Wu, 2020</p>	<p>“Taken together, our data indicate sustained humoral immunity in recovered patients who suffer from symptomatic COVID-19, suggesting prolonged immunity.”</p>

122) Evidence for sustained mucosal and systemic antibody responses to SARS-CoV-2 antigens in COVID-19 patients , Isho, 2020	“Whereas anti-CoV-2 IgA antibodies rapidly decayed, IgG antibodies remained relatively stable up to 115 days PSO in both biofluids. Importantly, IgG responses in saliva and serum were correlated, suggesting that antibodies in the saliva may serve as a surrogate measure of systemic immunity.”
123) The T-cell response to SARS-CoV-2: kinetic and quantitative aspects and the case for their protective role , Bertoletti, 2021	“Early appearance, multi-specificity and functionality of SARS-CoV-2-specific T cells are associated with accelerated viral clearance and with protection from severe COVID-19.”
124) The longitudinal kinetics of antibodies in COVID-19 recovered patients over 14 months , Eyrán, 2020	“Found a significantly faster decay in naïve vaccinees compared to recovered patients suggesting that the serological memory following natural infection is more robust compared to vaccination. Our data highlights the differences between serological memory induced by natural infection vs. vaccination.”
125) Continued Effectiveness of COVID-19 Vaccination among Urban Healthcare Workers during Delta Variant Predominance , Lan, 2021	“Followed a population of urban Massachusetts HCWs...we found no re-infection among those with prior COVID-19, contributing to 74,557 re-infection-free person-days, adding to the evidence base for the robustness of naturally acquired immunity.”
126) Immunity to COVID-19 in India through vaccination and natural infection , Sarraf, 2021	“Compared the vaccination induced immune response profile with that of natural infection, evaluating thereby if individuals infected during the first wave retained virus specific immunity...the overall immune response resulting from natural infection in and around Kolkata is not only to a certain degree better than that generated by vaccination, especially in the case of the Delta variant, but cell mediated immunity to SARS-CoV-2 also lasts for at least ten months after the viral infection.”
127) Asymptomatic or mild symptomatic SARS-CoV-2 infection elicits durable neutralizing antibody responses in children and adolescents , Garrido, 2021	“Evaluated humoral immune responses in 69 children and adolescents with asymptomatic or mild symptomatic SARS-CoV-2 infection. We detected robust IgM, IgG, and IgA antibody responses to a broad array of SARS-CoV-2 antigens at the time of acute infection and 2 and 4 months after acute infection in all participants. Notably, these antibody responses were associated with virus-neutralizing activity that was still detectable 4 months after acute infection in 94% of children. Moreover, antibody responses and neutralizing activity in sera from children and adolescents were comparable or superior to those observed

	<p>in sera from 24 adults with mild symptomatic infection. Taken together, these findings indicate that children and adolescents with mild or asymptomatic SARS-CoV-2 infection generate robust and durable humoral immune responses that can likely contribute to protection from reinfection.”</p>
<p>128) T cell response to SARS-CoV-2 infection in humans: A systematic review, Shrotri, 2021</p>	<p>“Symptomatic adult COVID-19 cases consistently show peripheral T cell lymphopenia, which positively correlates with increased disease severity, duration of RNA positivity, and non-survival; while asymptomatic and paediatric cases display preserved counts. People with severe or critical disease generally develop more robust, virus-specific T cell responses. T cell memory and effector function has been demonstrated against multiple viral epitopes, and, cross-reactive T cell responses have been demonstrated in unexposed and uninfected adults, but the significance for protection and susceptibility, respectively, remains unclear.”</p>
<p>129) Severity of SARS-CoV-2 Reinfections as Compared with Primary Infections, Abu-Raddad, 2021</p>	<p>“Reinfections had 90% lower odds of resulting in hospitalization or death than primary infections. Four reinfections were severe enough to lead to acute care hospitalization. None led to hospitalization in an ICU, and none ended in death. Reinfections were rare and were generally mild, perhaps because of the primed immune system after primary infection.”</p>
<p>130) Assessment of the Risk of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) Reinfection in an Intense Re-exposure Setting, Abu-Raddad, 2021</p>	<p>“SARS-CoV-2 reinfection can occur but is a rare phenomenon suggestive of protective immunity against reinfection that lasts for at least a few months post primary infection.”</p>
<p>131) Increased risk of infection with SARS-CoV-2 Beta, Gamma, and Delta variant compared to Alpha variant in vaccinated individuals, Andeweg, 2021</p>	<p>“Analyzed 28,578 sequenced SARS-CoV-2 samples from individuals with known immune status obtained through national community testing in the Netherlands from March to August 2021. They found evidence for an “increased risk of infection by the Beta (B.1.351), Gamma (P.1), or Delta (B.1.617.2) variants compared to the Alpha (B.1.1.7) variant after vaccination. No clear differences were found between vaccines. However, the effect was larger in the first 14-59 days after complete vaccination compared to 60 days and longer. In contrast to vaccine-induced immunity, no increased risk for reinfection with Beta, Gamma or Delta variants relative to Alpha variant was found in individuals with infection-induced immunity.”</p>

<p>132) <u>Prior COVID-19 protects against reinfection, even in the absence of detectable antibodies</u>, <u>Breathnach</u>, 2021</p>	<p>“Studies did not address whether prior infection is protective in the absence of a detectable humoral immune response. Patients with primary or secondary antibody deficiency syndrome and reduced or absent B cells can recover from COVID-19...Although there have been few mechanistic studies, preliminary data show that such individuals generate striking T-cell immune responses against SARS-CoV-2 peptide pools...SARS-CoV-2 specific T cell immune responses but not neutralising antibodies are associated with reduced disease severity suggesting the immune system may have considerable redundancy or compensation following COVID-19...our results add to the emerging evidence that detectable serum antibody may be an incomplete marker of protection against reinfection. This could have implications for public health and policy-making, for example if using seroprevalence data to assess population immunity, or if serum antibody levels were to be taken as official evidence of immunity – a minority of truly immune patients have no detectable antibody and could be disadvantaged as a result. Our findings highlight the need for further studies of immune correlates of protection from infection with SARS-CoV-2, which may in turn enhance development of effective vaccines and treatments.”</p>
<p>133) <u>Natural infection vs vaccination: Which gives more protection?</u>, Rosenberg, 2021</p>	<p>“With a total of 835,792 Israelis known to have recovered from the virus, the 72 instances of reinfection amount to 0.0086% of people who were already infected with COVID...By contrast, Israelis who were vaccinated were 6.72 times more likely to get infected after the shot than after natural infection, with over 3,000 of the 5,193,499, or 0.0578%, of Israelis who were vaccinated getting infected in the latest wave.”</p>
<p>134) <u>Community transmission and viral load kinetics of the SARS-CoV-2 delta (B.1.617.2) variant in vaccinated and unvaccinated individuals in the UK: a prospective, longitudinal, cohort study</u>, Singanayagam, 2021</p>	<p>“Nonetheless, fully vaccinated individuals with breakthrough infections have peak viral load similar to unvaccinated cases and can efficiently transmit infection in household settings, including to fully vaccinated contacts.”</p>
<p>135) <u>Antibodies elicited by mRNA-1273 vaccination bind more broadly to the receptor binding domain than do those from SARS-CoV-2 infection</u>, Greaney, 2021</p>	<p>“The neutralizing activity of vaccine-elicited antibodies was more targeted to the receptor-binding domain (RBD) of the SARS-CoV-2 spike protein compared to antibodies elicited by natural infection. However, within the RBD, binding of vaccine-elicited antibodies was more broadly distributed across epitopes</p>

	<p>compared to infection-elicited antibodies. This greater binding breadth means that single RBD mutations have less impact on neutralization by vaccine sera compared to convalescent sera. Therefore, antibody immunity acquired by natural infection or different modes of vaccination may have a differing susceptibility to erosion by SARS-CoV-2 evolution.”</p>
<p>136) Antigen-Specific Adaptive Immunity to SARS-CoV-2 in Acute COVID-19 and Associations with Age and Disease Severity, Moderbacker, 2020</p>	<p>“Limited knowledge is available on the relationship between antigen-specific immune responses and COVID-19 disease severity. We completed a combined examination of all three branches of adaptive immunity at the level of SARS-CoV-2-specific CD4+ and CD8+ T cell and neutralizing antibody responses in acute and convalescent subjects. SARS-CoV-2-specific CD4+ and CD8+ T cells were each associated with milder disease. Coordinated SARS-CoV-2-specific adaptive immune responses were associated with milder disease, suggesting roles for both CD4+ and CD8+ T cells in protective immunity in COVID-19. Notably, coordination of SARS-CoV-2 antigen-specific responses was disrupted in individuals ≥ 65 years old. Scarcity of naive T cells was also associated with aging and poor disease outcomes. A parsimonious explanation is that coordinated CD4+ T cell, CD8+ T cell, and antibody responses are protective, but uncoordinated responses frequently fail to control disease, with a connection between aging and impaired adaptive immune responses to SARS-CoV-2.”</p>
<p>137) Protection and waning of natural and hybrid COVID-19 immunity, Goldberg, 2021</p>	<p>“Protection from reinfection decreases with time since previous infection, but is, nevertheless, higher than that conferred by vaccination with two doses at a similar time since the last immunity-conferring event.”</p>
<p>138) A Systematic Review of the Protective Effect of Prior SARS-CoV-2 Infection on Repeat Infection, Kojima, 202</p>	<p>“The protective effect of prior SARS-CoV-2 infection on re-infection is high and similar to the protective effect of vaccination.”</p>
<p>139) High-affinity memory B cells induced by SARS-CoV-2 infection produce more plasmablasts and atypical memory B cells than those primed by mRNA vaccines, Pape, 2021</p>	<p>“Compare SARS-CoV-2 spike receptor binding domain (S1-RBD)-specific primary MBCs that form in response to infection or a single mRNA vaccination. Both primary MBC populations have similar frequencies in the blood and respond to a second S1-RBD exposure by rapidly producing plasmablasts with an abundant immunoglobulin (Ig)A+ subset and secondary MBCs that are mostly IgG+ and cross-react with the B.1.351 variant. However, infection-</p>

	<p>induced primary MBCs have better antigen-binding capacity and generate more plasmablasts and secondary MBCs of the classical and atypical subsets than do vaccine-induced primary MBCs. Our results suggest that infection-induced primary MBCs have undergone more affinity maturation than vaccine-induced primary MBCs and produce more robust secondary responses.”</p>
<p>140) Differential antibody dynamics to SARS-CoV-2 infection and vaccination, Chen, 2021</p>	<p>“Optimal immune responses furnish long-lasting (durable) antibodies protective across dynamically mutating viral variants (broad). To assess robustness of mRNA vaccine-induced immunity...compared antibody durability and breadth after SARS-CoV-2 infection and vaccination...While vaccination delivered robust initial virus-specific antibodies with some cross-variant coverage, pre-variant SARS-CoV-2 infection-induced antibodies, while modest in magnitude, showed highly stable long-term antibody dynamics...Differential antibody durability trajectories favored COVID-19-recovered subjects with dual memory B cell features of greater early antibody somatic mutation and cross-coronavirus reactivity...illuminating an infection-mediated antibody breadth advantage and an anti-SARS-CoV-2 antibody durability-enhancing function conferred by recalled immunity.”</p>
<p>141) Children develop robust and sustained cross-reactive spike-specific immune responses to SARS-CoV-2 infection, Dowell, 2022</p>	<p>“Compare antibody and cellular immunity in children (aged 3-11 years) and adults. Antibody responses against spike protein were high in children and seroconversion boosted responses against seasonal Beta-coronaviruses through cross-recognition of the S2 domain. Neutralization of viral variants was comparable between children and adults. Spike-specific T cell responses were more than twice as high in children and were also detected in many seronegative children, indicating pre-existing cross-reactive responses to seasonal coronaviruses. Importantly, children retained antibody and cellular responses 6 months after infection, whereas relative waning occurred in adults. Spike-specific responses were also broadly stable beyond 12 months. Therefore, children generate robust, cross-reactive and sustained immune responses to SARS-CoV-2 with focused specificity for the spike protein. These findings provide insight into the relative clinical protection that occurs in most children and might help to guide the design of pediatric vaccination regimens.”</p>

<p>142) <u>Severity of SARS-CoV-2 Reinfections as Compared with Primary Infections</u>, Abu-Raddad, 2021</p>	<p><u>Abu-Raddad et al.</u> has recently published on the severity of SARS-CoV-2 reinfections as compared with primary infections. They reported that in earlier studies, they assessed the efficacy of previous natural infection “as protection against reinfection with SARS-CoV-2 as being 85% or greater. Accordingly, for a person who has already had a primary infection, the risk of having a severe reinfection is only approximately 1% of the risk of a previously uninfected person having a severe primary infection...Reinfections had 90% lower odds of resulting in hospitalization or death than primary infections. Four reinfections were severe enough to lead to acute care hospitalization. None led to hospitalization in an ICU, and none ended in death. Reinfections were rare and were generally mild, perhaps because of the primed immune system after primary infection.”</p>
<p>143) <u>SARS-CoV-2 spike T cell responses induced upon vaccination or infection remain robust against Omicron</u>, Keeton, 2021</p>	<p>“Assessed the ability of T cells to react with Omicron spike in participants who were vaccinated with Ad26.CoV2.S or BNT162b2, and in unvaccinated convalescent COVID-19 patients (n = 70). We found that 70-80% of the CD4 and CD8 T cell response to spike was maintained across study groups. Moreover, the magnitude of Omicron cross-reactive T cells was similar to that of the Beta and Delta variants, despite Omicron harbouring considerably more mutations. Additionally, in Omicron-infected hospitalized patients (n = 19), there were comparable T cell responses to ancestral spike, nucleocapsid and membrane proteins to those found in patients hospitalized in previous waves dominated by the ancestral, Beta or Delta variants (n = 49). These results demonstrate that despite Omicron’s extensive mutations and reduced susceptibility to neutralizing antibodies, the majority of T cell response, induced by vaccination or natural infection, cross-recognises the variant. Well-preserved T cell immunity to Omicron is likely to contribute to protection from severe COVID-19, supporting early clinical observations from South Africa.”</p>
<p>144) <u>Pre-existing immunity against swine-origin H1N1 influenza viruses in the general human population</u>, Greenbaum, 2009</p>	<p>“69% (54/78) of the epitopes recognized by CD8+ T cells are completely invariant. We further demonstrate experimentally that some memory T-cell immunity against S-OIV is present in the adult population and that such memory is of similar magnitude as the pre-existing memory against seasonal H1N1 influenza. Because protection from infection is antibody mediated, a new vaccine based on the specific S-OIV HA and NA proteins is likely to be required</p>

	<p>to prevent infection. However, T cells are known to blunt disease severity. Therefore, the conservation of a large fraction of T-cell epitopes suggests that the severity of an S-OIV infection, as far as it is determined by susceptibility of the virus to immune attack, would not differ much from that of seasonal flu. These results are consistent with reports about disease incidence, severity, and mortality rates associated with human S-OIV...overall, 49% of the epitopes reported in the literature and present in recently circulating seasonal H1N1 are also found totally conserved in S-OIV. Interestingly, the number of conserved epitopes varied greatly as a function of the class of epitopes considered. Although only 31% of the B-cell epitopes were conserved, 41% of the CD4+ and 69% of the CD8+ T-cell epitopes were conserved. It is known that cross-reactive T-cell immune responses can exist even between serologically distinct influenza A strains (14, 15). Based on this observation and the data presented above, we hypothesized that it is possible that immune memory responses against S-OIV exist in the adult population, at the level of both B and T cells.”</p>
<p>145) Protection afforded by prior infection against SARS-CoV-2 reinfection with the Omicron, variant, Altarawneh, 2021</p>	<p>“<i>PES</i> against symptomatic reinfection was estimated at 90.2% (95% CI: 60.2-97.6) for Alpha, 84.8% (95% CI: 74.5-91.0) for Beta, 92.0% (95% CI: 87.9-94.7) for Delta, and 56.0% (95% CI: 50.6-60.9) for Omicron. Only 1 Alpha, 2 Beta, 0 Delta, and 2 Omicron reinfections progressed to severe COVID-19. None progressed to critical or fatal COVID-19. <i>PES</i> against hospitalization or death due to reinfection was estimated at 69.4% (95% CI: -143.6-96.2) for Alpha, 88.0% (95% CI: 50.7-97.1) for Beta, 100% (95% CI: 43.3-99.8) for Delta, and 87.8% (95% CI: 47.5-97.1) for Omicron.”</p>
<p>146) Cross-reactive memory T cells associate with protection against SARS-CoV-2 infection in COVID-19 contacts, Kundu, 2022</p>	<p>“Observe higher frequencies of cross-reactive ($p = 0.0139$), and nucleocapsid-specific ($p = 0.0355$) IL-2-secreting memory T cells in contacts who remained PCR-negative despite exposure ($n = 26$), when compared with those who convert to PCR-positive ($n = 26$); no significant difference in the frequency of responses to spike is observed, hinting at a limited protective function of spike-cross-reactive T cells. Our results are thus consistent with pre-existing non-spike cross-reactive memory T cells protecting SARS-CoV-2-naïve contacts from infection, thereby supporting the inclusion of non-spike antigens in second-generation vaccines.”</p>

<p>147) <u>Long-Term Persistence of IgG Antibodies in recovered COVID-19 individuals at 18 months and the impact of two-dose BNT162b2 (Pfizer-BioNTech) mRNA vaccination on the antibody response</u>, Dehgani-Mobaraki, 2021</p>	<p>“At 18 months, 97% participants tested positive for anti-NCP hinting towards the persistence of infection-induced immunity even for the vaccinated individuals.”</p> <p>“Enrolled 412 adults mostly with mild or moderate disease course. At each study visit, subjects donated peripheral blood for testing of anti-SARS-CoV-2 IgG antibodies and IFN-γ release after SARS-CoV-2 S-protein stimulation. Anti-SARS-CoV-2 IgG antibodies were identified in 316/412 (76.7%) of the patients and 215/412 (52.2%) had positive neutralizing antibody levels. Likewise, in 274/412 (66.5 %) positive IFN-γ release and IgG antibodies were detected. With respect to time after infection, both IgG antibody levels and IFN-γ concentrations decreased by about half within three hundred days. Statistically, IgG and IFN-γ production were closely associated, but on an individual basis we observed patients with high antibody titres but low IFN-γ levels and vice versa. Our data suggest that immunological reaction is acquired in most individuals after infection with SARS-CoV-2 and is sustained in the majority of patients for at least 10 months after infection.”</p>
<p>148) <u>Long-term course of humoral and cellular immune responses in outpatients after SARS-CoV-2 infection</u>, Schiffner, 2021</p>	<p>“Enrolled 412 adults mostly with mild or moderate disease course. At each study visit, subjects donated peripheral blood for testing of anti-SARS-CoV-2 IgG antibodies and IFN-γ release after SARS-CoV-2 S-protein stimulation. Anti-SARS-CoV-2 IgG antibodies were identified in 316/412 (76.7%) of the patients and 215/412 (52.2%) had positive neutralizing antibody levels. Likewise, in 274/412 (66.5 %) positive IFN-γ release and IgG antibodies were detected. With respect to time after infection, both IgG antibody levels and IFN-γ concentrations decreased by about half within three hundred days. Statistically, IgG and IFN-γ production were closely associated, but on an individual basis we observed patients with high antibody titres but low IFN-γ levels and vice versa. Our data suggest that immunological reaction is acquired in most individuals after infection with SARS-CoV-2 and is sustained in the majority of patients for at least 10 months after infection.”</p>

<p>149) <u>COVID-19 Cases and Hospitalizations by COVID-19 Vaccination Status and Previous COVID-19 Diagnosis — California and New York, May–November 2021</u>, Leon, 2022</p>	<p>“By the week beginning October 3, compared with COVID-19 cases rates among unvaccinated persons without a previous COVID-19 diagnosis, case rates among vaccinated persons without a previous COVID-19 diagnosis were 6.2-fold (California) and 4.5-fold (New York) lower; rates were substantially lower among both groups with previous COVID-19 diagnoses, including 29.0-fold (California) and 14.7-fold lower (New York) among unvaccinated persons with a previous diagnosis, and 32.5-fold (California) and 19.8-fold lower (New York) among vaccinated persons with a previous diagnosis of COVID-19. During the same period, compared with hospitalization rates among unvaccinated persons without a previous COVID-19 diagnosis, hospitalization rates in California followed a similar pattern. These results demonstrate that vaccination protects against COVID-19 and related hospitalization, and that surviving a previous infection protects against a reinfection and related hospitalization. Importantly, infection-derived protection was higher after the Delta variant became predominant, a time when vaccine-induced immunity for many persons declined because of immune evasion and immunologic waning.”</p>
<p>150) <u>Prevalence and Durability of SARS-CoV-2 Antibodies Among Unvaccinated US Adults by History of COVID-19</u>, Alejo, 2022</p>	<p>“In this cross-sectional study of unvaccinated US adults, antibodies were detected in 99% of individuals who reported a positive COVID-19 test result, in 55% who believed they had COVID-19 but were never tested, and in 11% who believed they had never had COVID-19 infection. Anti-RBD levels were observed after a positive COVID-19 test result up to 20 months, extending previous 6-month durability data</p>