Health Evidence Review Commission's Value-based Benefits Subcommittee

May 8, 2014

8:30 AM

Clackamas Community College
Wilsonville Training Center, Room 111-112
29373 SW Town Center Loop E, Wilsonville, Oregon, 97070

Section 1.0

Call to Order

Section 1.0

Staff Report

AGENDA
VALUE-BASED BENEFITS SUBCOMMITTEE
May 8, 2014
8:30am - 1:30pm

Clackamas Community College, Room 111-112
Wilsonville Training Center
29353 SW Town Center Loop E
Wilsonville, Oregon 97070

A working lunch will be served at approximately 12:00 PM
All times are approximate

I. Call to Order, Roll Call, Approval of Minutes – Lisa Dodson **8:30 AM**

II. Staff report – Ariel Smits, Cat Livingston, Darren Coffman **8:35 AM**

III. Straightforward/Consent Agenda – Ariel Smits **8:40 AM**
A. Straightforward corrections for May, 2014
B. Corrections to mistakes on October 1, 2014 Prioritized List

IV. New discussion items – Cat Livingston **8:45 AM**
A. Quality of evidence document

V. Previous Discussion Items – Ariel Smits, Cat Livingston **9:00 AM**
A. Treatments for gender dysphoria
    A. Cross-sex hormone therapy
    B. Sex reassignment surgery
B. Applied behavior analysis for autism spectrum disorders

VI. Guidelines – Ariel Smits, Cat Livingston **10:30 AM**
A. Rehabilitation Therapies guideline
B. Guideline revision for treatment of sleep apnea
C. Fluoride varnish guideline revision

VII. New discussion items – Ariel Smits, Cat Livingston **11:15 AM**
A. Computer aided mammography
B. Electronic tumor treatment fields
C. Electroconvulsive therapy (ECT)
D. Hip fractures

VIII. New HCPCS codes – Ariel Smits **12:00 PM**
A. Transurethral prostatic implants for BPH

IX. Biennial review – Ariel Smits **12:15 PM**
A. Lymphedema
B. Somatization/factitious disorder line merge

C. Restructuring of low back pain lines
D. Miscellaneous Conditions with No or Minimally Effective Treatments or No Treatment Necessary
E. Injuries to blood vessels of the neck

X. Public comment **1:25 PM**

XI. Adjournment – Lisa Dodson **1:30 PM**

Value-based Benefits Subcommittee Recommendations Summary
For Presentation to:
Health Evidence Review Commission in March 2014

For specific coding recommendations and guideline wording, please see the text of the 3-13-14 VbBS minutes.

CODE MOVEMENT

- The procedure code for repair of webbed finger was removed from 5 lines but remains on one covered line
- Screening for lung cancer among certain high risk persons was added to the covered prevention services line with a diagnostic guideline
- A dental risk assessment procedure code was added to the covered preventive services line with a new guideline
- The procedure code for chemodenervation for migraine was added to the covered migraine line with a future guideline planned to specify when this procedure is covered

BIENNIAL REVIEW

- A new line was created for fibromyalgia which will be located at approximately line 534, with a new guideline associated with the line regarding treatment.

GUIDELINE CHANGES

- The non-genetic testing guideline was modified to specify the training/experience requirements for clinicians who can provide genetic counseling.
- The prophylactic treatment for breast cancer among high risk women guideline was modified to refer to the non-genetic testing guideline specifications for the type of clinician who can provide genetic counseling.

ICD-10

- The final October 1, 2014 ICD-10 Prioritized List was approved

VALUE-BASED BENEFITS SUBCOMMITTEE
Meridian Park Health
Community Health Education Center, Room 117B&C
Tualatin, OR
March 13, 2014
8:30 AM – 1:00 PM

Members Present: Lisa Dodson, MD, Chair; Kevin Olson, MD, Vice-chair; James Tyack, DMD; David Pollack, MD; Mark Gibson; Laura Ocker, LAc.

Members Absent: Irene Croswell RPh; Susan Williams, MD

Staff Present: Darren Coffman; Ariel Smits, MD, MPH; Cat Livingston, MD, MPH; Jason Gingerich; Dorothy Allen; Denise Taray

Also Attending: Wally Shaffer, MD, DMAP; Jesse Little, OHA Actuarial Services Unit; Mike Willett CGC; Tami Stackelhouse, Jen Chambers, and Robert Staples, Fibromyalgia-Me/CFS; Melissa Gard, ORABA; Deirdre Monroe, Camille Kerr, and Jennifer Stoll, Allergan; Shannalisa Prusse, Zone Compounding; Kim Jones, PhD and Dr. Robert Bennett, OHSU; Tobi Rates, Autism Society; Matt Krebs, US Gov't Relation; Karen Kovak, OHA; Tom Culhane, Atrio; Jan Chambers, NFMCPA; Dianne Danowski Smith, Publix NW ; Jenn Burleton, TransActive Gender Center; Larry Burnett, DMD; David McElhattan, Peter Molof , Aubrey Harrison, and Maura Roche, Basic Rights Oregon; Deborah Weston, DMAP

Roll Call/Minutes Approval/Staff Report

The meeting was called to order at 8:30 AM and roll was called. Minutes from the January 9, 2104 VbBS meeting were reviewed and no corrections or changes were recommended.

MOTION: To approve the January 9, 2014 VbBS minutes as presented. CARRIES 6-0.

ACTION: HERC staff will post the approved minutes on the website as soon as possible.

Staff introduced Denise Taray, RN, who is the new coordinator of the Oregon Pain Management Commission and will be working with the HERC staff focusing on Prioritized List support.

- **Topic: Straightforward/Consent agenda**

  Discussion: There was no discussion.

Actions:

1) Remove E&M codes from lines 654 and 655
2) Remove 26560-26562 from lines 290, 391, 430, 511, and 534
3) Rename line 122 NUTRITIONAL ~~ANEMIAS~~ DEFICIENCIES
4) Remove the following coding specification from line 364: "~~Chemodenervation with botulinum toxin injection (CPT 64612-64614) is included on this line only for treatment of blepharospasm (ICD-9 333.81), spasmodic torticollis (ICD-9 333.83), and other fragments of torsion dystonia (ICD-9 333.89).~~"

- **Topic: Biennial Review**

Discussion: Smits reviewed the progress to date on the 2014 Biennial Review. She informed the subcommittee that the suggested creation of a perinatal gastrointestinal condition line was not recommended by HERC staff after further review. The 6 ICD-10 codes proposed for placement on this line can be placed on other, existing lines with similar conditions and appropriate treatments. The subcommittee approved this change.

Smits requested input on whether injury to blood vessels in the neck should be placed on a new line. Currently, these injuries are on Line 135 CRUSH INJURIES OTHER THAN DIGITS; COMPARTMENT SYNDROME. These diagnoses could be placed on their own, new line, or moved to either 82 INJURY TO MAJOR BLOOD VESSELS OF EXTREMITIES or 280 INJURY TO BLOOD VESSELS OF THE THORACIC CAVITY. Members felt that injuries to the major neck vessels would be similar in severity to injury of thoracic vessels. However, there was concern that these diagnoses should have a higher prioritization than the current line for repair of thoracic blood vessel injuries. This line was given lower priority than the repair of extremity blood vessels because of lower effectiveness of treatment. The decision was made to have staff bring a proposed new line for injuries to blood vessels of the neck to the next meeting with suggested scoring. If the scoring is determined to be close to a current line with similar conditions, then the neck blood vessel injury ICD-10 codes would move to that line. If not, then a new line would be created as part of the biennial review for the April 2016 Prioritized List.

Members approved the remaining topics on the list for the biennial review, to be discussed at the May meeting.

Actions:

1) HERC staff to create a proposal for a new line for injuries to the blood vessels of the neck
2) Other topics for the biennial review:
    a. Restructuring of low back pain lines

i. Create effective treatment line with high priority and non-effective treatment line with low priority
ii. Replace current differentiation by neurological symptoms

b. Creation of a miscellaneous line with no treatments necessary

- **Topic: Fibromyalgia**

Discussion: The summary document on fibromyalgia was reviewed. Testimony was heard from Kim Jones, PhD from OHSU, Dr. Robert Bennett from OHSU, and Jen Chambers from the National Fibromyalgia and Chronic Pain Association. This group testified that fibromyalgia has greater similarity to rheumatoid arthritis than to osteoarthritis in terms of suffering and life year scoring. Dr. Jones proposed that efficacy of treatment for fibromyalgia should be a 3, not a 1 as suggested by HERC staff. Dr. Bennett reviewed results of an unpublished survey of fibromyalgia patients. He also noted higher rates of suicidality among fibromyalgia in the literature. Ms. Chambers discussed her experience with fibromyalgia and noted than untreated fibromyalgia adversely affects the family and community.

Additional testimony was heard from Tammi Stackelhouse, from the Fibromyalgia Association. She showed results from a petition to have OHP cover fibromyalgia treatment. She argued that effective treatment helps patients become more functional and possibly return to work. Shannalisa Pruse from Zone Compounding testified that topical compounded medications are helpful in fibromyalgia. Robert Staples, whose wife has fibromyalgia, testified to the severity of her condition and to its effects on him as a caregiver.

The subcommittee discussed the scoring of the proposed new fibromyalgia line. Healthy years score was determined to be 4 given the disability some patients experience from this condition. Suffering was determined to be a 3 based on the severe effects on some patients and the lesser effects on other patients who do not seek specialty care. Effectiveness for treatment of pain from fibromyalgia in the medical literature was determined to be about 15%, or a score of 1. The members noted that future literature may show higher effectiveness, and the scoring could be revised in the future. Co-morbid conditions such as depression, migraine, etc. are in the covered area of the list and treatment would be covered. The group voted on the line scoring which gave a score of 112 with approximate line placement of 534.

The guideline for the new line which was discussed in January was again reviewed. There was discussion about what types of medications should be included in the first bullet point example. The decision was to simply specify that medications should not include opioids. There was some discussion about whether all patients need multi-modality care with two or more types of treatment, particularly those patients with mild disease. Multi-modal care is called out in

various evidence based guidelines, and the group decided it should continue to be in the new guideline.

MOTION: To approve the creation of a new line for fibromyalgia with coding as shown in the meeting materials, with scoring as shown below, and a new guideline for this line as revised. CARRIES 6-0.

Actions:

1) Create a new line for fibromyalgia effective January 1, 2016:

   LINE XXX
   Condition: Fibromyalgia
   Treatment: Medical Therapy
   ICD-10: M79.7
   CPT: CBT (90785, 90832-90853), medical office visits (98966-99215, 99441-99449, 99487-99489), medical team conference (99366-99368), preventive medicine visit (99381-99429)

2) Adopted line scoring:
   Category: 7
   Healthy Life: 4
   Pain & suffering: 3
   Population effects: 0
   Vulnerable population: 0
   Tertiary prevention: 0
   Effectiveness: 1
   Need for service: 0.8
   Net cost: 2
   Score: 112
   Approximate line placement: 534

3) Adopt a new guideline for this line as shown in Appendix A

- **Topic: Somatization/Factitious Disorder Line Merge**

  Discussion: Tabled to the May, 2014 VBBS meeting

- **Topic: Lung Cancer Screening Guideline**

  Discussion: The summary document was reviewed. There was discussion about requiring smoking cessation prior to screening, as this would be the most effective intervention to reduce lung cancer incidence. However, it was felt that in the high risk Medicaid population, and in the mental health population, this would be a large barrier. Olson stated that programs with a smoking cessation component have lower rates of screening. Stopping smoking did not affect outcomes in the trials of lung cancer screening. Coffman noted that the ACA

requires coverage of USPSTF level B recommendations, such as lung cancer screening. The group decided to place lung cancer screening on the higher preventive services line with a diagnostic guideline. A sentence was added to the proposed guideline stating that current smokers should be offered evidence-based smoking cessation interventions.

MOTION: To approve the addition of ICD-10 Z12.2 to line 3 and the new diagnostic guideline as amended. CARRIES 6-0

Actions:

1) Add ICD-10 Z12.2 to Line 3 PREVENTIVE SERVICES for the October 1, 2014 Prioritized List and advise DMAP to remove from the Excluded List
2) Add a new diagnostic guideline as shown in Appendix A

- **Topic: Genetic counseling in the non-prenatal genetic testing guideline**

Discussion: The summary document was reviewed. Karen Kovak testified about need to order appropriate testing and to know which patients should be tested. The group discussed when genetic counseling should be given by board-certified physicians without specialized board certification in genetics rather than specialized genetics professionals. It was determined that in a few time-sensitive cases, such as a woman with a breast tumor who needs a mastectomy and needs quick BRCA testing to determine best treatment, testing by a non-board certified physician would be acceptable as long as specialized genetic consultation was obtained as soon after testing as practical. The suggested wording for this portion of the guideline was changed to add in "time-sensitive cases" to stress that this exception should be very narrow.

MOTION: To approve the proposed changes to guideline note 3 and the amended changes to diagnostic guideline D1. CARRIES 6-0

Actions:

1) Modify diagnostic guideline D1 as shown in Appendix B
2) Modify guideline note 3 as shown in Appendix B

- **Topic: Guideline revision for treatment of sleep apnea**

Discussion: Tabled to the May, 2014 VBBS meeting

- **Topic: Fluoride varnish guideline revision**

Discussion: Tabled to the May, 2014 VBBS meeting

- **Topic: Rehabilitation guideline revision**

  Discussion: The summary document was reviewed. There was discussion about whether a revised guideline should continue to include unlimited therapy visits for the first 3 months after an acute event. This coverage is not reflected in commercial plans, but allows intensive therapy after surgery or acute injury. The members expressed interest in input from the PT/OT community. Shaffer noted that increasing visit limits would have a budgetary impact. He also noted that the Medical Directors have requested a well-defined limit on therapy visits that is easy to implement.

  After discussion, the group determined that the guideline should be changed to allow 30 therapy visits a year, and to eliminate the unlimited 3 month coverage after an acute event. Consideration may be given for more visits in cases of rapid developmental changes, documented progress with continued need for services, and other special cases. Wording should be included in the revised guideline to require documented improvement to continue to receive services within the allowed initial 30 visits.

  Actions:
  1) HERC staff will draft wording for the rehabilitation guideline to reflect the above discussion and bring back to the May VBBS meeting

- **Topic: Transgender hormone therapy**

  Discussion: The summary document was reviewed. Members noted that there is a low level of evidence supporting the use of cross-sex hormone therapy for gender dysphoria. There was concern that the level of evidence used to support coverage of treatments and conditions should be consistent across the Prioritized List. Staff noted that the Oregon Insurance Division has issued a bulletin requiring regulated health plans to require cross-sex hormone therapy when other types of hormone therapy are covered. This bulletin does not apply to the Medicaid program.

  Testimony was heard from Jenn Burleton from TransActive and Aubrey Harrison from Basic Rights Oregon about the available evidence for cross-hormone therapy use and about the current legal landscape around treatment of transgendered persons. Ms. Burleton stressed that puberty suppression treatment, which is currently planned for coverage on the new gender dysphoria line, needs to transition to cross-sex hormone therapy after about 3-4 years. Both noted that it is difficult to study treatment of transgendered persons because of difficulty with identification of this population.

Actions:

1) HERC staff work to with experts to obtain the current evidence of effectiveness for cross-sex hormone therapy and for sex reassignment surgery for gender dysphoria and bring back this evidence and recommendations for coverage to the May VBBS meeting

- **Topic: ABA intensity for treatment of autism spectrum disorder**

Discussion: Livingston reviewed the status of the draft evidence evaluation on applied behavior analysis (ABA) for autism spectrum disorder (ASD). The Evidence-based Guidelines Subcommittee (EbGS) is currently reviewing the topic and will complete its work at their April 24th meeting. She reviewed the current coverage for autism spectrum disorder, which includes up to 8 hours per month of behavioral treatment. The current draft being reviewed by EbGS (included in the meeting materials) recommends coverage of some types of ABA for children ages 2-12, but that subcommittee may not put forth recommendations on intensity and duration of treatment as the service is often highly individualized and the evidence doesn't suggest a specific minimum or maximum treatment. There are temporary new CPT codes that go into effect July 1st which may be used to specify ABA. Further discussion regarding treatment of autism will be held after the EbGS report is finalized, but as it will likely require extensive discussion, staff wanted to get initial input from VbBS to shape its recommendation.

Livingston reviewed the key evidence around coverage, including hours per week and duration of treatment, as well as parameters for evaluating treatment progress and the difference for comprehensive versus focused ABA. Eric Larsson, who serves as one of the HERC's three appointed ad hoc experts, testified and answered questions regarding this treatment. Larsson said focused treatment averages 18 months and intensive treatment averages about 3 years followed by 1 year of fadeout. However these are averages, not outside limits. About half of the children can expect to reach goal in that timeframe, but the others will require continued help, and 10 percent of these don't benefit from ABA at all and need a different approach. For the remaining 40 percent, the goal would be to titrate down the level hours over an extended period of time and have increasing care provided by parents and teachers. Livingston asked whether the outside duration would be 3 years. As for initiation of treatment, Larsson said if a child doesn't start intensive therapy by the age of nine, only one in 50 children would reach a point where they don't require special education. He then spoke on the need for individualized treatment rather than a hard cap on hours based on an average from studies and also the need for adequate supervision by adequately trained analysts. In addition, evidence supports both parent- and clinic-based interventions, but Larsson testified that some parents are unable to manage intensive treatment, as it is quite demanding on a family. The goal would be to transition a child from intensive clinic-based treatment to

treatment provided by the family, educational systems and other community supports.

The subcommittee then heard public testimony from Melissa Gard from the Oregon Association for Behavior Analysis and Tobi Rates from the Autism Society of Oregon. Gard briefly reviewed evidence and guidelines for this treatment and emphasized the need for individualized treatments. She emphasized the importance of intensity of treatment as well as the intensity of treatment supervision. She said there needs to be appropriate supervision for each case and said that more intensive supervision is associated with adaptive IQ gains and adaptive function.

A member asked whether that contradicted the evidence in the evaluation which didn't associate treatment intensity with improved outcomes. Livingston said the core source reports do not show a direct relationship between intensity and these outcomes. Livingston asked Gard about a separate study showing an association between intensity and outcomes. That study compared 3 to 8 hours of supervision. Gard clarified that the 3-8 hours of supervision was the behavior analyst's supervision and treatment planning and that additional hours of comprehensive treatment were provided by less skilled staff totaling about 30 hours per week for each child. Livingston asked how important it is to specify the different levels of care—whether the VbBS should recommend a global number of hours or require a certain level of supervision. Gard replied that it would be important to specify the level of supervision, but said as long as the bill is in place it might be redundant to have VbBS add additional requirements.

The subcommittee discussed the requirements of Senate Bill 365, which requires state-regulated health plans cover 25 hours per week of medically necessary ABA therapy for children who initiate therapy by the age of 9. However Gard said that children who require additional therapy can rely on mental health parity and other laws to get additional hours of treatment. She said that advocates wanted Senate Bill 365 because families previously sometimes needed to go through appeals and to court in order to get coverage. She advocates coverage based on the child's individual progress rather than maximum limits on duration and intensity. The subcommittee discussed how families might be unlikely to bring their children in for treatment if it is not working, so that might limit overuse. Olson suggested that hard limits on intensity and duration might be impractical and not add value, especially due to low reimbursement rates under OHP. Pollack suggested that plans might want to have each health plan have an ASD expert to manage cases.

Dodson asked about whether this is a health service or educational service. Gard said that this intervention can be done in school, but questioned whether that is the appropriate place, especially for very young children. In an educational setting, the treatment goals are limited to accessing education rather than the child's overall needs. Dodson asked how medical treatment should interact with

educational care. Gard said that consultation between mental health providers and educators are important. The goal would be to move towards less mental health care and more educational services.

Livingston asked the subcommittee if there are specific areas the subcommittee would like to have proposed language about. Pollack asked for draft language from the experts, especially regarding duration and intensity.

- **Topic: Oral health risk assessment codes**
-

Discussion: The summary document was reviewed. Testimony was heard by Larry Burnett, DMD regarding the need for early screening and intervention. Livingston stated that the dental screening code proposed for addition to the prevention line would allow this screening. The members requested that the word "undergone" be changed to "successfully completed" in the proposed guideline.

MOTION: To approve the suggested changes for D0145, D0601-D0603, and D0191. Approve the guideline note as amended. CARRIES 6-0.

Actions:

1) Remove D0145 from Line 3. Keep only on Line 58
2) Do not add D0601-D0603 to Lines 1 and 3
3) Keep D0191 on Line 3
4) Revise Guideline Note 122 Oral Health Risk Assessment as shown in Appendix B

- **Topic: Botulinum toxin for chronic migraine**

Discussion: The summary document was reviewed. Medicaid law regarding need to provide a "pathway to coverage" for medications was reviewed.

MOTION: To approve the addition of CPT 64615 to line 414. CARRIES 5-0 (Pollack abstained).

Actions:

1) Add CPT 64615 (Chemodenervation for migraine) to line 414 MIGRAINE HEADACHES

2) HERC staff to bring a guideline to the June or August VBBS with specific limitations for this procedure based on the coverage criteria determined at the May P&T Committee meeting.

- **Topic: Final approval of October 1, 2014 ICD-10 Prioritized List**

Discussion: Staff summarized the staff work to date to correct errors and otherwise finalize the October 1, 2014 ICD-10 Prioritized List.

MOTION: To approve the October 1, 2014 ICD-10 Prioritized List. CARRIES 6-0.

Actions:

1) The October 1, 2014 Prioritized List will be published on the website soon after the April 1, 2014 Prioritized List goes into effect.

- **Public Comment:**

No additional public comment was received.

- **Issues for next meeting:**
  - Biennial review
    - Injury to major blood vessels in the neck
    - Somatization/factitious disorder line merge
    - Restructuring of low back pain lines
    - Creation of a miscellaneous line with no treatments necessary
  - Cross sex hormone therapy and gender reassignment surgery for gender dysphoria
  - Guideline revision for treatment of sleep apnea
  - Fluoride varnish guideline revision
  - Rehabilitation guideline revisions
  - Electronic tumor field treatment
  - Electroconvulsive therapy
  - Bone anchored hearing aids

- **Next meeting:**

May 8, 2014 at:
Clackamas Community College, Room 111-112
Wilsonville Training Center
29353 SW Town Center Loop E
Wilsonville, Oregon 97070

- **Adjournment:**

The meeting was adjourned at 1:35 PM.

Appendix A

New Guidelines

DIAGNOSTIC GUIDELINE DXX LUNG CANCER SCREENING

Low dose computed tomography is included for annual screening for lung cancer in persons aged 55 to 80 years who have a 30 pack-year smoking history and currently smoke or have quit within the past 15 years. Screening should be discontinued once a person has not smoked for 15 years or develops a health problem that substantially limits life expectancy or the ability or willingness to have curative lung surgery. Current smokers should be offered evidence based smoking cessation interventions.

GUIDELINE XXX, FIBROMYALGIA

Line AAA

Fibromyalgia (ICD-9 729.1/ICD-10 M79.7) treatment should consist of a multi-modal approach, which should include two of more of the following:

1) medications other than opioids
2) exercise advice/programs
3) cognitive behavioral therapy.

Care should be provided in the primary care setting. Referrals to specialists are generally not required. Use of opioids should be avoided due to evidence of harm in this condition.

Appendix B

Revised Guidelines

DIAGNOSTIC GUIDELINE D1, NON-PRENATAL GENETIC TESTING GUIDELINE

Coverage of genetic testing in a non-prenatal setting shall be determined by the algorithm shown in Figure D1 unless otherwise specified below.

A) Related to genetic testing for patients with breast/ovarian and colon/endometrial cancer or other related cancers suspected to be hereditary, or patients at increased risk to due to family history.
   1) Services are provided according to the Comprehensive Cancer Network Guidelines.
      a) Lynch syndrome (hereditary colorectal and endometrial cancer, and other cancers associated with Lynch syndrome) services (CPT 81292-81300, 81317-81319) and familial adenomatous polyposis (FAP) services (CPT 81201-81203) should be provided as defined by the NCCN Clinical Practice Guidelines in Oncology. Colorectal Cancer Screening. V.1.2013 (5/13/13). ***www.nccn.org***
      b) BRCA1/BRCA2 testing services (CPT 81211-81217) for women without a personal history of breast, ~~and/or~~ ovarian, and other associated cancers should be provided to high risk women as defined in Guideline Note 3 or as otherwise defined by the US Preventive Services Task Force.
      c) BRCA1/BRCA2 testing services (CPT 81211-81217) for women with a personal history of breast, ~~and/or~~ ovarian, and other associated cancers and for men with breast cancer should be provided according to the NCCN Clinical Practice Guidelines in Oncology. Genetic/Familial High-Risk Assessment: Breast and Ovarian. V.1.2011 (4/7/11). ***www.nccn.org***
      d) PTEN (Cowden syndrome) services (CPT 81321-81323) should be provided as defined by the NCCN Clinical Practice Guidelines in Oncology. Colorectal Screening. V.1.2013 (5/13/13). ***www.nccn.org.***
   2) Genetic counseling should precede genetic testing for hereditary cancer whenever possible. ~~Very rarely, it may be appropriate for a genetic test to be performed prior to genetic counseling for a patient with cancer. If this is done, genetic counseling should be provided as soon as practical~~.
      a) Pre and post-test genetic counseling ~~by the following providers~~ should be covered when provided by a suitably trained health professional with expertise and experience in cancer genetics
         i) "Suitably trained" is defined as board certified or active candidate status from the American Board of Medical Genetics, American Board of Genetic Counseling, or Genetic Nursing Credentialing Commission.
         ~~ii) Medical Geneticist (M.D.) - Board Certified or Active Candidate Status from the American Board of Medical Genetics~~
         ~~iii) Clinical Geneticist (Ph.D.) - Board Certified or Active Candidate Status from the American Board of Medical Genetics.~~
         ~~iv) Genetic Counselor - Board Certified or Active Candidate Status from the American Board of Genetic Counseling, or Board Certified by the American Board of Medical Genetics.~~

Appendix B

Revised Guidelines

v) ~~Advance Practice Nurse in Genetics - Credential from the Genetic Nursing Credentialing Commission.~~

b) If timely pre-test genetic counseling is not possible for time-sensitive cases, appropriate genetic testing accompanied by pre- and post- test informed consent and post-test disclosure performed by a board-certified physician with experience in cancer genetics should be covered.

i) i) Post-test genetic counseling should be performed as soon as is practical.

GUIDELINE NOTE 3, PROPHYLACTIC TREATMENT FOR PREVENTION OF BREAST CANCER IN HIGH RISK WOMEN

Line 195

Bilateral prophylactic breast removal is included on Line 195 for women without a personal history of invasive breast cancer who are at high risk for breast cancer. Prior to surgery, women without a personal history of breast cancer must have a genetics consultation as defined in section A2 of the DIAGNOSTIC GUIDELINE D1, NON-PRENATAL GENETIC TESTING GUIDELINE. High risk is defined as:

A) Having a BRCA1/BRCA2 mutation;

B) Having a strong family history of breast cancer, defined as one of the following:

1) 2 first-degree or second degree relatives diagnosed with breast cancer at younger than an average age of 50 years (at least one must be a first-degree relative);
2) 3 first-degree or second-degree relatives diagnosed with breast cancer at younger than an average age of 60 years (at least one must be a first-degree relative);
3) 4 relatives diagnosed with breast cancer at any age (at least one must be a first-degree relative);
4) 1 relative with ovarian cancer at any age and, on the same side of the family, either 1 first-degree relative (including the relative with ovarian cancer) or second-degree relative diagnosed with breast cancer at younger than age 50 years, or 2 first-degree or second-degree relatives diagnosed with breast cancer at younger than an average age of 60 years, or another ovarian cancer at any age;
5) 1 first-degree relative with cancer diagnosed in both breasts at younger than an average age of 50 years;
6) 1 first-degree or second-degree relative diagnosed with bilateral breast cancer and one first-degree or second-degree relative diagnosed with breast cancer at younger than an average age of 60 years; or,
7) a male relative with breast cancer at any age and on the same side of the family at least 1 first-degree or second-degree relative diagnosed with breast cancer at younger than age 50 years, or 2 first-degree or second-degree

relatives diagnosed with breast cancer at younger than an average age of 60 years.

C) A history of LCIS with a family history of breast cancer; or,

D) A history of treatment with thoracic radiation between ages 10 and 30.

Contralateral prophylactic mastectomy is included on Line 195 for women with a personal history of breast cancer and any of the high risk categories listed above. In addition, contralateral prophylactic mastectomy of the unaffected breast is indicated for women with invasive lobular carcinoma.

Prophylactic oophorectomy is included on Line 195 for women who have the BRCA1/BRCA2 mutation

GUIDELINE NOTE 122, ORAL HEALTH RISK ASSESSMENT IN MEDICAL SETTINGS

Lines 1~~,3,58~~

~~CDT codes D0601-D0603 and D0191 coverage is restricted on these lines as follows:~~
~~Line 1: pregnant women only~~
~~Line 3: children under the age of 6 only~~
~~Line 56: children under the age of 21 only~~

~~These services are included when performed using approved tools and when~~ D0191 is limited to children under age 6 and requires an additional specific oral health risk assessment using a standardized tool, such as AAP Bright Futures, and should be performed by a provider who has successfully completed an approved training program (such as First Tooth or Smiles for Life).

Section 2.0

Consent Agenda-

Straightforward Items

Straightforward Issues—May, 2014

Code	Code Description	Line(s) Involved	Issue	Recommendation(s)
45397	Laparoscopy, surgical; proctectomy, combined abdominoperineal pull-through procedure (eg, colo-anal anastomosis), with creation of colonic reservoir (eg, J-pouch), with diverting enterostomy, when performed	**161** CANCER OF COLON, RECTUM, SMALL INTESTINE AND ANUS	DMAP is requesting that 45397 pair with 154.1 (Malignant neoplasm of rectum). 45397 is currently on lines 32,105,535. All similar CPT codes are on line 161	Add 45397 to line 161
44310	Ileostomy or jejunostomy, non-tube	**158** VASCULAR INSUFFICIENCY OF INTESTINE	DMAP is requesting that 44310 pair with 557.0 (Acute vascular insufficiency of intestine). 44310 is currently on lines 32,46,75,51,92,105,161.	Add 44310 to line 158

Corrections to mistakes for Oct 1, 2014 Prioritized List approved by leadership for May

1) The list of ICD-10 codes for inclusion on lines 136, 358 and 447 were cut off on the materials reviewed by the HERC. All codes originally marked for inclusion on this line were placed there.
2) Lymphedema, NOS (I89.0) was moved from line 579 LYMPHEDEMA to line 427 COMPLICATIONS OF A PROCEDURE USUALLY REQUIRING TREATMENT
    a. This is consistent with previous Commission intent that lymphedema be covered on the complications line. The placement of I89.0 on line 579 appears to be a mistake done during the ICD-10 review.
3) I89.1 (Lymphangitis) was moved from 579 LYMPHEDEMA to 209 SUPERFICIAL ABSCESSES AND CELLULITIS
    a. Consistent with all other acute lymphangitis codes (L03.0x)

Section 3.0

Quality of evidence document

Quality of evidence/criteria for topic selection

Question: Should the quality of evidence document be revised and split into two documents?

Question source: HERC Staff

Issue: There is some confusion regarding the current quality of evidence document. During the EbGS discussion of autism, many of the public misunderstood this document to relate equally to sources for coverage guidances as well as for the Prioritized List. This was clarified in EbGS public meetings. However, there could also be further clarity on quality of sources versus strength of evidence. In addition, separating the criteria for topic selection for the prioritized list from the quality of evidence document might reduce confusion.

Current document:

Criteria for Topic Review on the Placement of Services on the Prioritized List for the Health Evidence Review Commission

The Health Evidence Review Commission will consider health services topics when evidence is presented to indicate that current condition-treatment pairings may be inappropriately ranked on the Prioritized List or are in need of updating.

Situations where topics may be reviewed include:

- A new treatment that has become available, with acceptable evidence of its clinical effectiveness and/or cost-effectiveness
- A change in current practice, best supported by high quality systematic reviews and/or evidence based guidelines
- When acceptable evidence is unavailable, expert opinion alone indicating that a more effective or cost-effective treatment exists or that community standard of care differs from the current pairing will be considered

Please note that review of a topic does not necessarily lead to a change in the Prioritized List. All presenters to the Commission must provide disclosure of potential conflicts of interest.

Guidelines for Submitted Materials to the Health Evidence Review Commission

The HERC relies heavily on high quality evidence and evidence-based guidelines in making its prioritization decisions. Lower quality evidence may be considered in situations where higher quality evidence is difficult to obtain (e.g., rare clinical conditions). Clinical judgment will still need to be used by the Commission to determine whether the available evidence is sufficient and compelling enough to affect prioritization decisions.

The following types of evidence are considered *high quality*:

- Systematic reviews of randomized controlled trials
- Systematic reviews of prospective cohort studies
- Evidence-based guidelines from trusted sources

Quality of evidence/criteria for topic selection

Examples of Sources of high-quality evidence

- Agency for Healthcare Research and Quality (AHRQ) http://www.ahrq.gov/clinic/
- Blue Cross Blue Shield Technology Evaluation Center (TEC) http://www.bcbs.com/blueresources/tec/
- British Medical Journal (BMJ) Clinical Evidence http://www.clinicalevidence.com
- Canadian Coordinating Office for Health Technology Assessment (CCOHTA) http://www.cadth.ca/index.php/en/hta
- Cochrane Database of Systematic Reviews http://www2.cochrane.org/reviews/
- Evidence-Based Practice Centers (EPC) www.ahcpr.gov/clinic/epc
- Health Technology Assessment Programme - United Kingdom http://www.hta.nhsweb.nhs.uk/ProjectData
- National Institute for Clinical Excellence (NICE) - United Kingdom http://guidance.nice.org.uk/
- Scottish Intercollegiate Guidelines Network (SIGN) http://www.sign.ac.uk/guidelines/index.html
- University of York http://www.york.ac.uk/inst/crd/

The following sources are considered *medium quality* and are often examined by the HERC.

- Guidelines issued by professional societies and advocacy organizations (e.g. American Heart Association)
- Coverage decisions by private health plans (e.g. Aetna)
- Well-conducted, peer-reviewed individual studies (experimental or observational)

The following types of evidence are considered *low quality* and are rarely reviewed by the HERC

- Case reports, case series
- Unpublished studies (posters, abstracts, presentations, non-peer reviewed articles)
- Individual studies that are poorly conducted, do not appear in peer-reviewed journals, are inferior in design or quality to other relevant literature, or duplicate information in other materials under review by the Commission

The HERC Medical Director will include a summary of high quality evidence in the meeting packets, along with the documents themselves, for the Commissioners to review. Discretion will be used, with the HERC Medical Director consulting with the Value-based Benefits Subcommittee Chair, to determine if medium or low quality sources will be included for Commissioner review. A listing of other materials submitted but not included for Commissioner review will also be included in the packets to acknowledge their receipt, along with the reason for their omission.

HERC Staff Recommendations:
Modify the document, replacing it with two separate documents which would address criteria for topic selection and quality of evidence for the Prioritized List work. The Coverage Guidance process has separate materials on its process for evaluating evidence and selecting topics.

Health Evidence Review Commission

Criteria for Prioritized List topic selection

The Health Evidence Review Commission will consider health services topics when evidence is presented to indicate that current condition-treatment pairings may be inappropriately ranked on the Prioritized List or that other aspects of the List require updating.

Examples:

- A new treatment is available, with acceptable evidence of its clinical effectiveness and/or cost-effectiveness. (When acceptable evidence is unavailable, the Commission may consider lower-quality evidence or expert opinion.)
- A change in community standard of care requires changes to the Prioritized List, and the change is supported by high-quality systematic reviews and/or evidence based guidelines

Topic review does not guarantee a change in the Prioritized List. In general, the Commission does not eliminate covered condition-treatment pairs or remove coverage restrictions currently in place unless there is sufficiently strong evidence to support changing current policy.

Health Evidence Review Commission

Quality of Evidence Statement

HERC relies heavily on high quality evidence and evidence-based guidelines in making prioritization decisions.

The following source list illustrates how HERC and the Value-based Benefits Subcommittee (VbBS) view various types of evidence for prioritization decisions. The existence of evidence in the form of a high-quality study design does not necessarily mean that the overall evidence on that topic will be considered high quality. For instance, a high quality systematic review might find that the available studies have significant potential for bias and may conclude there is a low strength of evidence or insufficient evidence to support an intervention.

Lower quality evidence may sometimes be considered in situations where higher quality evidence is difficult to obtain (for example, in rare clinical conditions).

The commission also includes other factors into its decision making process, such as harms, treatment alternatives, health equity and the needs of specific subgroups when relevant data exists.
HERC may consider various factors in evaluating a particular study, including:

- Potential for bias
- Clinical significance of outcomes studied
- Strength of evidence, not just quality
- Study relevance based on population and health system characteristics
- Conflicts of interests of the authors

The following sources generally produce high quality evidence and are preferred by HERC:

- Agency for Healthcare Research and Quality (AHRQ) http://www.ahrq.gov/clinic/
- Blue Cross Blue Shield Technology Evaluation Center (TEC) http://www.bcbs.com/blueresources/tec/
- British Medical Journal (BMJ) Clinical Evidence http://www.clinicalevidence.com
- Canadian Coordinating Office for Health Technology Assessment (CCOHTA) http://www.cadth.ca/index.php/en/hta
- Cochrane Database of Systematic Reviews http://www2.cochrane.org/reviews/
- Evidence-Based Practice Centers (EPC) www.ahcpr.gov/clinic/epc
- Health Technology Assessment Programme - United Kingdom http://www.hta.nhsweb.nhs.uk/ProjectData
- National Institute for Clinical Excellence (NICE) - United Kingdom http://guidance.nice.org.uk/
- Scottish Intercollegiate Guidelines Network (SIGN) http://www.sign.ac.uk/guidelines/index.html
- University of York http://www.york.ac.uk/inst/crd/

The following types of study designs can be considered high quality and are preferred by HERC:

- Systematic reviews of randomized controlled trials
- Systematic reviews of prospective cohort studies
- Evidence-based guidelines from trusted sources

The following types of study designs/documents can be considered lower quality and are often reviewed by HERC:

- Guidelines issued by professional societies and advocacy organizations (e.g. American Heart Association)
- Coverage decisions by private health plans (e.g. Aetna)
- Well-conducted, peer-reviewed individual studies (experimental or observational)

The following types of evidence can be considered very low quality and are seldom reviewed by HERC:

- Case reports, case series
- Unpublished studies (posters, abstracts, presentations, non-peer reviewed articles)
- Individual studies that are poorly conducted, do not appear in peer-reviewed journals, are inferior in design or quality to other relevant literature, or duplicate information in other materials under review by the Commission

Section 4.0

Previously Discussed Items

Treatment for Gender Dysphoria 2014

Question: What therapies should be included for treatment of gender dysphoria on the Prioritized List?

Question Source: HERC staff, OHA

Issue:
The October 1, 2014 Prioritized List includes Gender Dysphoria as a new, covered line (413). Currently, the only treatments on this line are office visits, psychotherapy and puberty suppression medication for transgender and gender-questioning youth. Other treatments for gender dysphoria include cross-sex hormone therapy and sex reassignment (gender reassignment) surgery.

Currently on the Prioritized List, hormone therapy is currently covered for women with menopausal symptoms, men in need of testosterone, and for similar hormone replacement needs. Transgender cross-sex hormone therapy is not currently a covered benefit. Cross-sex hormone treatment is an off-label use of estrogens and androgens. Hormone therapy in transgender individuals is cross-sex hormone therapy (rather than "replacement therapy") with the goal of reducing endogenous hormones and replacing those with cross-sex hormones. This would alter secondary sexual characteristics and psychological characteristics with the goal of relieving gender dysphoria.

Currently, sex reassignment surgery is an Excluded service. Sex reassignment is a multi-step process involving multiple possible procedures. For male to female sex reassignment, procedures may include genital reconstruction (vaginoplasty, penectomy, orchidectomy, clitoroplasty), breast augmentation and cosmetic surgery (facial reshaping, rhinoplasty, abdominoplasty, laryngeal shaving, vocal cord shortening, hair transplants). For female to male sex reassignment, surgical procedures may include genital reconstruction (phalloplasty, genitoplasty, hysterectomy, bilateral oophorectomy), mastectomy, chest wall contouring and cosmetic surgery.

From the World Professional Association for Transgender Health (available at http://www.wpath.org):

> Medically necessary sex reassignment procedures also include complete hysterectomy, bilateral mastectomy, chest reconstruction or augmentation as appropriate to each patient (including breast prostheses if necessary), genital reconstruction (by various techniques which must be appropriate to each patient, including, for example, skin flap hair removal, penile and testicular prostheses, as necessary), facial hair removal, and certain facial plastic reconstruction as appropriate to the patient…
>
> The medical procedures attendant to sex reassignment are not "cosmetic" or "elective" or for the mere convenience of the patient. These reconstructive procedures are not optional in any meaningful sense, but are understood to be medically necessary for the treatment of the diagnosed condition.

Cross-sex hormone therapy and sex reassignment surgery were discussed at the March, 2014 VBBS meeting. At that time, commission members expressed interest in considering both hormone therapy and sex reassignment surgery as possible options for treatment of gender dysphoria. However, there was concern about the low level of

evidence of effectiveness for these therapies. Testimony was heard about the difficulty of studying transgendered persons due to difficulty in identifying these persons, high study drop-out rates, etc. Testimony was also heard about the current legal environment around treatment of transgendered persons. There was also concern raised about covering puberty suppression for gender questioning children and adolescents without any follow up therapy available. HERC staff was directed to work with experts to review the evidence of effectiveness for cross-sex hormone therapy and for sex reassignment surgery.

Evidence Summary

No evidence from NICE, SIGN, or Cochrane available

1) **New Zealand 2003**, health technology assessment
    a. 10 studies: 1 systematic review, 1 prospective controlled study, 1 retrospective cohort study and 7 quasi-experimental studies.
    b. Conclusions: The quality of the evidence is poor and based on a small number of studies with weak study designs and significant methodological limitations. The reviewed studies may indicate that early, rather than delayed, sex reassignment surgery is of greater benefit to transsexual people who have gone through rigorous assessment procedures and have been accepted for surgery. Gender reassignment surgery may benefit some carefully assessed and selected transsexual people who have satisfied recognised diagnostic and eligibility criteria, and have received recognised standards of care for surgery. More research is required to improve the evidence base identifying the subgroups of transsexual people most likely to benefit from sex reassignment surgery.
2) **Murad, 2010**
    a. Systematic review and meta-analysis of impact of hormonal therapy and sex reassignment on health outcomes
    b. Included 28 observational studies, N = 1833 participants with GID (1093 male-to-female, 801 female-to male) who underwent sex reassignment that included hormonal therapies.
    c. Results: after sex reassignment, 80% of individuals with GID reported significant improvement in gender dysphoria (95% CI = 68–89%; 8 studies; I2 = 82%); 78% reported significant improvement in psychological symptoms (95% CI = 56–94%; 7 studies; I2 = 86%); 80% reported significant improvement in quality of life (95% CI = 72–88%; 16 studies; I2 = 78%); and 72% reported significant improvement in sexual function (95% CI = 60–81%; 15 studies; I2 = 78%).
    d. Conclusions: Very low quality evidence suggests that sex reassignment that includes hormonal interventions in individuals with GID likely improves gender dysphoria, psychological functioning and comorbidities, sexual function and overall quality of life.

Risks/adverse effects

1) **Gooren 2014**, review of management of female to male transgendered persons
    a. Contrary to earlier expectations, there is no increase in cardiovascular disease. (Hormone-related) cancers are rare, but vaginal, cervical,

endometrial carcinomas have been reported. Cancers of the breasts are of greater concern and have been found in residual mammary tissue after breast ablation. So far, androgen treatment has not raised major safety concerns. Regrets about changing sex have not been reported.

2) **Asscheman 2011**, cohort study of adverse effects of cross sex hormone therapy
    a. 966 male-to-female (MtF) and 365 female-to-male (FtM) transsexuals vs general population
    b. median follow-up of 18.5 years at a university gender clinic.
    c. MtF transsexuals received treatment with different high-dose estrogen regimens and cyproterone acetate 100 mg/day. FtM transsexuals received parenteral/oral testosterone esters or testosterone gel. After surgical sex reassignment, hormonal treatment was continued with lower doses.
    d. Results: In the MtF group, total mortality was 51% higher than in the general population, mainly from increased mortality rates due to suicide, acquired immunodeficiency syndrome, cardiovascular disease, drug abuse, and unknown cause. No increase was observed in total cancer mortality, but lung and hematological cancer mortality rates were elevated. Current, but not past ethinyl estradiol use was associated with an independent threefold increased risk of cardiovascular death. In FtM transsexuals, total mortality and cause-specific mortality were not significantly different from those of the general population.
    e. Conclusions: The increased mortality in hormone-treated MtF transsexuals was mainly due to nonhormone- related causes, but ethinyl estradiol may increase the risk of cardiovascular death. In the FtM transsexuals, use of testosterone in doses used for hypogonadal men seemed safe.

3) Elamin, 2010
    a. Systematic review of harms of hormone therapy in transgender persons
    b. N = 16 uncontrolled studies (very low quality)
    c. Conclusions: cross-sex hormone therapies increase serum triglycerides in MF and FM and have a trivial effect on HDL-cholesterol and systolic blood pressure in FM. Data about patient important outcomes are sparse and inconclusive.

<u>Other guidelines</u>

1) **NHS 2013**, treatment guidelines for gender dysphoria
    a. Treatment protocols may include cross-sex hormone therapy, appropriate medical monitoring for complications of cross-sex hormone therapy, psychotherapy, hair removal, and sex reassignment surgery
    b. Patients must meet the following eligibility and readiness criteria as adapted from the World Professional Association for Transgender Health (WPATH) Standards of Care
    c. The decision to recommend hormone therapy should have the documented support of two clinicians who are directly involved in patient's care; at least one must be medically qualified, who must make the prescribing recommendation.
    d. Hormone therapy may be recommended for patients who do not want surgery following assessment following assessment by GIC clinicians and in accordance with the standards described above. In some patients,

hormone therapy alone may provide sufficient symptomatic relief to obviate the need for transition to a different gender role or surgery

e. Continuous use of testosterone therapy in trans-men with an intact uterus increases their risk of developing endometrial hyperplasia and malignancy. Trans-men should be informed of this before commencing testosterone therapy and be strongly recommended to have a hysterectomy and bilateral salpingo-oophorectomy after receiving continuous testosterone therapy for 2-5 years
f. To undergo such major irreversible procedures [gender reassignment] patients must be sufficiently physically fit and meet the criteria listed below as adapted from the WPATH Standard of Care, 7th version.
g. The decision to offer this surgery will involve two opinions, one of which is from a member of the gender identity team or network that has clinical experience with the patient; the second opinion should come from a gender specialist who is not directly involved in the patient's care; at least one of the opinions should be given by a medically-qualified person.

2) Endocrine Society 2009 (Hembree 2009)

a. quality of evidence: low or very low.
b. Recommendations: Transsexual persons seeking to develop the physical characteristics of the desired gender require a safe, effective hormone regimen that will 1) suppress endogenous hormone secretion determined by the person's genetic/biologic sex and 2) maintain sex hormone levels within the normal range for the person's desired gender. A mental health professional (MHP) must recommend endocrine treatment and participate in ongoing care throughout the endocrine transition and decision for surgical sex reassignment. The endocrinologist must confirm the diagnostic criteria the MHP used to make these recommendations. Because a diagnosis of transsexualism in a prepubertal child cannot be made with certainty, we do not recommend endocrine treatment of prepubertal children. We recommend treating transsexual adolescents (Tanner stage 2) by suppressing puberty with GnRH analogues until age 16 years old, after which cross-sex hormones may be given. We suggest suppressing endogenous sex hormones, maintaining physiologic levels of gender-appropriate sex hormones and monitoring for known risks in adult transsexual persons.
c. Regarding sex reassignment: We recommend that transsexual persons consider genital sex reassignment surgery only after both the physician responsible for endocrine transition therapy and the MHP find surgery advisable. We recommend that genital sex reassignment surgery be recommended only after completion of at least 1 yr of consistent and compliant hormone treatment.

Other coverage policies:

1) **CMS** (undated), coverage guidance

a. Transsexual surgery for sex reassignment of transsexuals is controversial. Because of the lack of well controlled, long term studies of the safety and effectiveness of the surgical procedures and attendant therapies for transsexualism, the treatment is considered experimental. Moreover, there

is a high rate of serious complications for these surgical procedures. For these reasons, transsexual surgery is not covered.

2) Aetna 2013

a. Aetna considers sex reassignment surgery medically necessary when certain coverage criteria are met
    i. Note: many Aetna plans exclude sex reassignment surgery

Summary

Cross-sex hormone therapy, in conjunction with psychotherapy, may offer some benefit in self-reported outcomes for persons with gender dysphoria based on poor quality evidence. Gender reassignment surgery in conjunction with hormone therapy likely improves gender dysphoria, psychological functioning and comorbidities, sexual function and overall quality of life. Most major professional societies and evidence-based health systems such as the NHS recommend cross-sex hormone therapy and sex reassignment surgery be available for appropriate patients who meet strict eligibility criteria.

The evidence for both cross-sex hormone therapy and gender reassignment surgery is of poor quality. Outcomes for gender reassignment surgery appear good, with no patients reporting regrets. Outcomes for cross-sex hormone therapy are generally positive, with some medical complications noted in female to male transitioning patients.

Gender dysphoria is a condition with a significant morbidity and mortality. It affects a vulnerable population group. Treatment of this condition is an emerging field.

CPT codes for sex reassignment surgery

CPT code	Code description	Current placement
19301-19304	Mastectomy	195 CANCER OF BREAST
53430	Urethroplasty, reconstruction of female urethra	91 CONGENITAL ANOMALIES OF GENITOURINARY SYSTEM 331 FUNCTIONAL AND MECHANICAL DISORDERS OF THE GENITOURINARY SYSTEM INCLUDING BLADDER OUTLET OBSTRUCTION
54125	Amputation of penis; complete	262 CANCER OF PENIS AND OTHER MALE GENITAL ORGANS
54400-54417	Insertion/repair/removal of penile prosthesis	529 SEXUAL DYSFUNCTION Some on 290 COMPLICATIONS OF A PROCEDURE ALWAYS REQUIRING TREATMENT
54520	Orchiectomy, simple (including subcapsular), with or without testicular prosthesis, scrotal or inguinal approach	98,116,211,249,262,331,333,474
54660	Insertion of testicular prosthesis (separate procedure)	98 UNDESCENDED TESTICLE 249 TORSION OF TESTIS
54690	Laparoscopy, surgical; orchiectomy	98,116,428,474
55175-55180	Scrotoplasty	91, 262, 438 HYPOSPADIAS AND EPISPADIAS
55970	Intersex surgery; male to female	Excluded
55980	Intersex surgery; female to male	Excluded
56625	Vulvectomy simple; complete	291 CANCER OF VAGINA, VULVA, AND OTHER FEMALE GENITAL ORGANS
56800	Plastic repair of introitus	125,211,356,428
56805	Clitoroplasty for intersex state	428 ADRENOGENITAL DISORDERS,638 BENIGN CERVICAL CONDITIONS
56810	Perineoplasty, repair of perineum, nonobstetrical	125 ABUSE AND NEGLECT,428, 471 UTERINE PROLAPSE; CYSTOCELE
57106-57107	Vaginectomy, partial removal of vaginal wall;	291,471
57110-57111	Vaginectomy, complete removal of vaginal wall	291
57291-57292	Construction of artificial vagina	356 STRUCTURAL CAUSES OF AMENORRHEA
57335	Vaginoplasty for intersex state	428
58150, 58180, 58260-58262, 58275-58291, 58541-58544, 58550-58554, 58570-58573	Hysterectomy	Multiple lines, with several guidelines
58661	Laparoscopy, surgical; with removal of adnexal structures	Multiple lines
58720	Salpingo-oophorectomy, complete or partial, unilateral or bilateral	Multiple lines

Note: Rhinoplasty, face-lifting, lip enhancement, facial bone reduction, blepharoplasty, breast augmentation, liposuction of the waist (body contouring), reduction thyroid chondroplasty, hair removal, voice modification surgery (laryngoplasty or shortening of the vocal cords), and skin resurfacing, which have been used in feminization, are considered cosmetic. Similarly, chin implants, nose implants, and lip reduction, which have been used to assist masculinization, are considered cosmetic.

HSC Staff Recommendations:

1) **Option 1:**
    a. Do not add cross-sex hormone therapy or sex reassignment surgery to line 413 GENDER DYSPHORIA
    b. Create a new line for hormone and surgical treatment of gender dysphoria with appropriate prioritization
2) **Option 2**:
    a. Add cross-sex hormone therapy to line 413
        i. Change the treatment description of line 413
            1. Treatment: MEDICAL/PSYCHOTHERAPY; HORMONE THERAPY
        ii. Change the guideline note for line 413
    b. Create a new line for surgical treatment of gender dyshporia with appropriate prioritization
3) **Option 3**:
    a. Add coverage for cross-sex hormone therapy and sex reassignment surgery to line 413
        i. Change the guideline note for line 413
        ii. Add the CPT codes for sex reassignment surgery to line 413 (see table above)
        iii. Change the treatment description of line 413
            1. Treatment: MEDICAL/PSYCHOTHERAPY; HORMONE THERAPY; SURGICAL TREATMENT
4) **Option 4** (not recommended by staff):
    a. Make no changes, keep current line and keep CPT 55970 and 55980 on the Excluded List
        i. Not transparent to partners/outside organizations
        ii. Keeps the status quo; prevents the co-morbidity rule from being used

Note: options 1-3 require advising DMAP to remove CPT 55970 and 55980 from the Excluded List. The co-morbidity rule would then apply to these procedures.

GUIDELINE XXX GENDER DYSPHORIA

Line 413

Hormone treatment is included on this line for use in delaying the onset of puberty and/or continued pubertal development with GnRH analogues for gender questioning children and adolescents. This therapy should be initiated at the first physical changes of puberty, confirmed by purbertal levels of estradiol or testosterone, but no earlier than Tanner stages 2-3. Prior to initiation of puberty suppression therapy, adolescents must fulfill eligibility and readiness criteria, and must have a comprehensive mental health evaluation. Ongoing psychological care is strongly encouraged for continued puberty suppression therapy.

[Options 2 and 3] Cross-sex hormone therapy is included on this line for treatment of adolescents and adults with gender dysphoria who meet appropriate eligibility and readiness criteria. The decision to recommend hormone therapy should have the documented support of two clinicians who are directly involved in patient's care; at least one must be medically qualified, who must make the prescribing recommendation. Continuous use of testosterone therapy in trans-men with an intact uterus increases their risk of developing endometrial hyperplasia and malignancy. Trans-men should be informed of this before commencing testosterone therapy and be strongly recommended to have a hysterectomy and bilateral salpingo-oophorectomy after receiving continuous testosterone therapy for 2-5 years.

[Option 3 only] Sex reassignment surgery is included for patients who are sufficiently physically fit and meet eligibility criteria. The decision to offer this surgery will involve two opinions, one of which is from a member of the gender identity team or network that has clinical experience with the patient; at least one of the opinions should be given by a medically-qualified person. To qualify for surgery, the patient must:

1) Have completed twelve months of continuous hormone therapy as appropriate to the member's gender goals unless the member has a medical contraindication
2) Have completed twelve months of living in a gender role that is congruent with their gender identity (real life experience)
3) be 18 years of age or older
4) have any significant medical or mental health concerns reasonably well controlled

Line XXX
Condition: GENDER DYSPHORIA
Treatment: [option 1] HORMONE THERAPY/SURGICAL TREATMENT
Treatment: [option 2] SURGICAL TREATMENT
ICD-9: 302.85 (Gender identity disorder in adolescents or adults)
ICD10: F64.x (Gender identity disorder)
CPT: 19301-19304, 53430, 54125, 54400-54417, 54520, 54660, 54690, 55175-55180, 55970, 55980, 56625, 56800, 56805, 56810, 57106-57107, 57110-57111, 57291-57292, 57335, 58150, 58180, 58260-58262, 58275-58291, 58541-58544, 58550-58554, 58570-58573, 58661, 58720, outpatient medical visit codes
HCPCS:G0396,G0397,G0463

Scoring example (scoring for line 413 in parentheses)
Category: 7 (7)
HL: 3 (3)
Suffering: 4 (4)
Population effects: 0 (0)
Vulnerable population: 4 (0)
Tertiary prevention: 2 (3)
Effectiveness: 1 (2)
Need for service: 0.8 (1)
Net cost: 3 (2)
Score: 208
Approximate line placement: 474
[Note: would be next to current line 474 which includes hormonal menopausal management]

Clinical Endocrinology (2010) **72**, 214–231 doi: 10.1111/j.1365-2265.2009.03625.x

ORIGINAL ARTICLE

Hormonal therapy and sex reassignment: a systematic review and meta-analysis of quality of life and psychosocial outcomes

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Summary

Objective To assess the prognosis of individuals with gender identity disorder (GID) receiving hormonal therapy as a part of sex reassignment in terms of quality of life and other self-reported psychosocial outcomes.

Methods We searched electronic databases, bibliography of included studies and expert files. All study designs were included with no language restrictions. Reviewers working independently and in pairs selected studies using predetermined inclusion and exclusion criteria, extracted outcome and quality data. We used a random-effects meta-analysis to pool proportions and estimate the 95% confidence intervals (CIs). We estimated the proportion of between-study heterogeneity not attributable to chance using the I^2 statistic.

Results We identified 28 eligible studies. These studies enrolled 1833 participants with GID (1093 male-to-female, 801 female-to-male) who underwent sex reassignment that included hormonal therapies. All the studies were observational and most lacked controls. Pooling across studies shows that after sex reassignment, 80% of individuals with GID reported significant improvement in gender dysphoria (95% CI = 68–89%; 8 studies; I^2 = 82%); 78% reported significant improvement in psychological symptoms (95% CI = 56–94%; 7 studies; I^2 = 86%); 80% reported significant improvement in quality of life (95% CI = 72–88%; 16 studies; I^2 = 78%); and 72% reported significant improvement in sexual function (95% CI = 60–81%; 15 studies; I^2 = 78%).

Conclusions Very low quality evidence suggests that sex reassignment that includes hormonal interventions in individuals with GID likely improves gender dysphoria, psychological functioning and comorbidities, sexual function and overall quality of life.

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Introduction

Therapy with cross-sex hormones is used as a primary sex reassignment intervention or as an adjunct to sex reassignment surgery in individuals with gender identity disorder (GID). Hormonal therapies clearly exert a rapid and direct effect on gender specific behaviours such as aggressiveness, arousal, verbal fluency and visuospatial abilities.[1] Several studies have reported sex reassignment to be associated with favourable changes in family, psychological and social life, sexual relationships and gender dysphoria, defined as the distress that originates from the difference between one's biological sex and one's basic sense of being a male or a female.[2–4]

Despite these putative benefits, individuals with GID who undergo this transition continue to have high prevalence of psychiatric comorbidities such as depression and anxiety disorders, as well as a suicide rate that is higher than that of the general population.[2,5] Hormonal therapies may also be associated with adverse effects that should be considered in addition to other costs and burdens of treatments. These adverse events have improved with the use of newer transdermal preparations and the routine administration of lower doses,[6,7] but may continue to be of concern to patients and providers.

We sought to systematically review the literature for the best available evidence regarding the benefits and risks of hormonal therapy administered in this context. In this manuscript, we summarize the available evidence about benefits in terms of self-reported outcomes such as the resolution of gender dysphoria and the effects on sexual function, psychiatric comorbidities and quality of life.

Methods

The report of this protocol-driven systematic review adheres to the standards for reporting Meta-analysis Of Observational Studies in Epidemiology (MOOSE).[8]

Eligibility criteria

We considered studies to be eligible for this review if they enrolled male-to-female (MF) or female-to-male (FM) individuals

Management of female-to-male transgender persons: medical and surgical management, life expectancy

Louis J. Gooren

Purpose of review
Hormonal treatment of transgender people is becoming a normal part of medicine, though numbers of subjects remain small because of low prevalence. Information on treatment is scattered and this review brings together the latest information on treatment goals and potential side-effects of androgen treatment of female-to-male transsexual subjects.

Recent findings
Androgen treatment of female-to-male transsexuals is usually uneventful, with a good patient compliance. Goals of hormonal treatment are elimination of secondary sex characteristics of the female sex and induction of those of the male sex. Completion takes approximately 2 years. Hormonal treatment is eventually followed by surgical ablation of breasts and removal of uterus and ovaries. Phalloplasty may be considered. Concerns are the sequelae of hypogonadism following surgery, such as loss of bone mass. Contrary to earlier expectations, there is no increase in cardiovascular disease. (Hormone-related) cancers are rare, but vaginal, cervical, endometrial carcinomas have been reported. Cancers of the breasts are of greater concern and have been found in residual mammary tissue after breast ablation. So far, androgen treatment has not raised major safety concerns. Regrets about changing sex have not been reported.

Summary
Testosterone treatment of female-to-male transsexuals is effective and well tolerated.

Keywords
bone, cardiovascular disease, female-to-male transsexual, hormone related cancer, testosterone

INTRODUCTION

Treatment of transsexual people is not yet mainstream medicine. Numbers are small but increasing. With the publication of the clinical practice guidelines [1], the Endocrine Society helped to disseminate expertise on the treatment of transsexual people.

Sex identity is the sense one has of being male or female. Sex role is the (public) expression of sex identity. A significant incongruence between sex identity and physical phenotype is defined as gender dysphoria [2]. Its most extreme expression is transsexualism, characterized by an overwhelming desire to undergo phenotypical transition to the subjectively experienced sex by means of hormonal and surgical treatment [2,3].

The indication for cross-sex hormone treatment is the result of psychological assessment that concludes that sex reassignment will bring relief to an individual suffering from gender dysphoria. Although endocrine treatment is recommended by a mental health professional, the prescribing physician retains responsibility for the intervention. A close collaboration with a mental health professional is essential. Ideally, a sex team should consist of mental health professionals, endocrinologists, gynecologists and plastic surgeons, but because of the low prevalence, this is not always achievable.

Gender dysphoria may be manifest in children but may not persist. Persistence after the first signs of hormonal puberty reliably predicts permanence of gender dysphoria. Those children may be treated

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KEY POINTS

- Transgender medicine is making headway in endocrine practice.
- Short-term effects of androgens are acceptably well tolerated in female-to-male transsexual persons (F2M).
- Longer-term effects remain to be charted.

with GnRH analogues to halt hormonal pubertal development of their biological sex. Until more evidence is available, treatment with cross-sex hormones is delayed until the age of 16, in the Western world often the age of legal competence in medical matters [4].

Most physicians will not see large numbers of transsexual people. The most reliable data on the prevalence of transsexualism have been gathered from the treatment centers in small countries with a single center for sex reassignment, and treatment financially covered by the healthcare system. The Netherlands and Belgium find a calculated prevalence of transsexualism of 1 : 11 900 males and 1 : 30 400 females, with a sex ratio of approximately 3 : 1 [5,6]. These data represent persons who actually have changed their sex. Many more people cope with various degrees of gender dysphoria. In a sample of 4052 men and 4012 women in the Netherlands, 4.6% of men and 3.2% of women expressed a degree of ambivalence regarding their sex identity, whereas 1.1% of men and 0.8% of women described it as incongruent with their physical bodies, with a desire to undergo medical treatment in 0.7% of men and 0.2% of women [7], many more than the number of people who actually undergo sex reassignment treatment. Apparently, only those who suffer deeply from their gender dysphoria will decide to undergo sex reassignment treatment.

HORMONAL SEX REASSIGNMENT

This contribution focuses on the aspects of hormonal treatment of F2M. The Guidelines drafted by the Endocrine Society are not evidence-based recommendations, but rely on clinical experience and parallels in general expertise sex hormone treatment in hypogonadal (nontranssexual) subjects.

Goals of treatment

The goal of treatment in F2M is to induce virilization, including a deepening of the voice, production of male-pattern body hair growth and physical contours, and cessation of menses. The principal hormonal treatment is a testosterone preparation, usually testosterone esters (testosterone enanthate, cypionate or mixed testosterone esters), injectables administered intramuscularly in doses of 200–250 mg every 2 weeks. In some countries, testosterone undecanoate (1000 m) is available, and injections may be spaced at 10–12 weeks [8]. Use of self-administered androgen gel or transdermal patches provides, with adjustment, steady serum testosterone levels. Serum testosterone levels should be evaluated periodically to guard against prolonged administration of supraphysiologic doses, with potential deleterious effects such as polycythemia. Alternatively, serum testosterone levels may be too low, particularly if traditional testosterone esters are administered every 3–4 weeks [8] leading to, for instance, loss of bone mineral density (BMD) [9].

In about 30% of F2M, menstrual bleeding does not cease upon testosterone treatment, and the addition of a progestational agent is necessary (lynestrenol 5–10 mg/day or medroxyprogesterone oral 5–10 mg/day), particularly when a transdermal or oral testosterone preparation is used. The results of hormonal therapy in F2M have been reviewed [10,11].

Adult F2M undergoing sex reassignment have the disadvantage that in them, at an advanced age, a normal average degree of hormonal somatic feminization has irreversibly taken place, and the elimination of the hormonally induced sex characteristics of the natal sex is, therefore, rarely complete. The relatively lower height of F2M (12 cm compared with men), the broader hip configuration with a larger degree of subcutaneous fat, will not change under androgen treatment. These features show a degree of overlap between the sexes, and in some transsexuals, characteristics of the original sex will be more visible than in others.

SURGICAL SEX REASSIGNMENT PROCEDURES IN FEMALE-TO-MALE TRANSSEXUAL PERSONS

The operative procedures are usually performed in different stages: first is the subcutaneous mastectomy, which may be combined with a hysterectomy-ovariectomy (endoscopically assisted). The next operative procedure consists of the genital transformation and includes a vaginectomy, a reconstruction of the horizontal part of the urethra, a scrotoplasty and a penile reconstruction usually with a radial forearm flap (or an alternative). After about 1 year, penile (erection) prosthesis and testicular prostheses can be implanted when

sensation has returned to the tip of the penis [12]. A less elaborate and less costly surgical procedure is metoidioplasty (enlargement of the androgen-induced hypertrophy of the clitoris), in principle a one-stage procedure for construction of a microphallus. It usually permits standing urination [13].

REPRODUCTIVE FUNCTIONS IN FEMALE-TO-MALE TRANSSEXUAL PERSONS

When sex reassignment of transsexual people became a more accepted practice in medicine, it was almost axiomatic that, with the hormonal and surgical transition to the other sex, the procreative potential was irreversibly lost. This was 'the price to pay' for becoming a member of the other sex [14].

The thinking about the ethics of reproduction has changed and it is now widely accepted that every person has the fundamental right to procreate [15], and transsexual people should not forfeit the right to procreation. It has become accepted that sex reassignment of transsexual people is not optional and is vital for their well-being. It puts transsexual subjects in the same position as others whose procreative potential is jeopardized by their medical treatment, such as people with malignancies undergoing treatment with cytotoxic drugs or radiation. People need to be counseled on the sequelae of their medical interventions and they must receive information on options to preserve their procreative potential. For F2M, this involves banking of oocytes, embryos and ovarian tissue [16]. A number of androgen-treated F2M have carried full-term pregnancies [14–17].

EFFECTS OF TESTOSTERONE ADMINISTRATION ON MOOD AND SEXUALITY IN FEMALE-TO-MALE TRANSSEXUAL PERSONS

The overall results of sex reassignment in F2M are generally rewarding. They enjoy acceptance and establish intimate relationships [18]. A longitudinal study confirmed previous cross-sectional data of an overall positive effect on many parameters of sexual function and aspects of mood such as anger/aggressiveness of testosterone treatment in F2M subjects throughout the transition periods [18,19]. There are, in contrast to male-to-female transsexual persons (M2F), no reports on regrets about sex reassignment.

EFFECTS OF CROSS-SEX HORMONES ON BONE

Normal levels of sex steroid hormones are necessary for bone growth and maintenance of skeletal integrity. Testosterone and estradiol are crucial for maintaining bone mass accrual in adulthood. Hypogonadism in both sexes induces loss of bone. Estradiol limits periosteal bone expansion but stimulate endosteal bone apposition in females, whereas androgens stimulate radial bone expansion in males acting through the androgen receptor but also through activation of estradiol receptors following aromatization into estradiol [20]. Testosterone treatment of F2M alters the sex steroid milieu profoundly and will affect bone turnover and increase muscle mass [21], also relevant for preservation of bone mass. Part of the administered testosterone is aromatized to estradiol and levels [22] seem sufficient to maintain BMD, both in the shorter and longer term: 1.5–10years [23]. Androgen treatment of adult F2M also increases cortical bone size [23], cortical thickness [22] and BMD at cortical sites [24,25], reflecting the anabolic effect of androgens on the periosteal (outer) border of cortical bone. Histomorphometry showed a low bone turnover and preservation of trabecular bone with an increased cortical thickness, which could also reflect the anabolic effect of testosterone resulting in a more male type of bone. Testosterone treatment should be adequate, achieving high enough serum levels of testosterone, which may not always be the case with the traditional parenteral testosterone levels with its peak and trough serum levels [8]. More modern testosterone treatment modalities (parenteral testosterone undecanoate, testosterone gels) may be preferable. Naturally, compliance with testosterone treatment is pivotal for bone health. Serum levels of luteinizing hormone and follicle-stimulating hormone, likely reflecting serum testosterone, were inversely associated with bone mass in both sexes [9] and the *z*-score of the lumbar spine of M2F [24]. However, this could not be confirmed in later research [26,27]. Generally speaking, cross-sex hormone treatment does not pose major problems with regard to bone health. If there are no risk factors [smoking, excessive alcohol use, history of fracture, medication (for example glucocorticoids, family history of osteoporosis and fracture, previous use of (off-label) antiandrogens or anorexia nervosa], bone density is usually normal.

CROSS-SEX HORMONES AND CARDIOVASCULAR DISEASE

Mortality rates in adult men are higher than in women [28] and this difference is probably explained by sex differences in cardiovascular diseases. A classic study shows a rather consistent male-to-female ratio of 2.5 : 4.5 for fatal coronary heart disease in countries with very different rates of

heart disease [29]. Traditionally, the sex difference in cardiovascular morbidity/mortality has been attributed to the endocrine profiles of adult men and women surmising that androgens are deleterious and estrogens favorable for cardiovascular health. But research over the past two decades put this assumption into question (for review [30]). It is of interest to follow the effects of a profound shift in sex hormone patterns as experienced by transsexual persons, particularly when they age. Overall, a pattern emerges that administration of testosterone to F2M is not deleterious.

In a review of the effects of testosterone on surrogate risks of cardiovascular disease, testosterone administration to F2M affected some cardiovascular risk factors negatively, such as a decrease of high-density lipoprotein cholesterol, an increase of triglycerides and inflammation factors [31], but, notably, there was no induction of insulin resistance, which is characteristic of hyperandrogenic conditions in women such as polycystic ovarian syndrome [32].

In a clinical study in F2M, no elevated rates of cardiovascular mortality were encountered compared with men and women in the general population. The group studied had, however, only six persons over 65 years of age. Only one myocardial infarction was observed in a 72-year-old F2M person after 42 years of testosterone treatment. The incidence rate was 15 per 100 000 person-years in F2M (95% confidence interval: 1–68) [33]. But in another study of F2M, a higher cardiovascular mortality was observed compared with a control population [34]. This was, however, not confirmed in other larger studies [33,35]. So, most of the studies indicate that testosterone treatment in F2M is relatively well tolerated at short and medium follow-up, although it should be noted that outcome studies in transsexual men are performed in smaller sample sizes and at significant younger age of F2M compared with M2F.

In F2M with established cardiovascular disease or with increased cardiovascular risk, such as older age, administration of testosterone was not clearly increasing cardiovascular disease in two recent studies from the sex clinic in Gent (Belgium).

The first study reported on cardiovascular disease in 50 F2M, on average 10 years on cross-sex hormone therapy. Hypercholesterolemia (cholesterol $\geq$190 mg/dl or >4.9 mmol/l) was observed in 64% of F2M. Serum triglycerides were significantly elevated. About 28% of F2M had an elevated blood pressure at the time of investigation and/or used antihypertensive medication (26 vs. 28%). None of the F2M had experienced cardiovascular events such as myocardial infarction, cerebrovascular disease or deep venous thrombosis [36].

The second study reported on cardiovascular disease in 138 F2M, on average 7.4 years on testosterone treatment. Compared with both men and women, there was no difference in occurrence of myocardial infarctions, cerebrovascular disease and transient ischemic attacks. But a higher incidence of diabetes mellitus was noted [37▪].

CANCER IN FEMALE-TO-MALE TRANSSEXUAL PERSONS

The transsexual population is growing and aging and the time span of hormone exposure increases. Information on tumors in transsexual subjects has only appeared as case reports, lacking the power to prove a causal relationship, though they alert to the possibility. Neither do case reports provide epidemiological information so prevalence is unclear (for review: [38]).

Vaginal carcinoma

Testosterone administration has effects on the histology of the vagina [39,40] One case of vaginal carcinoma was reported 18 years after surgical sex reassignment treatment [41].

Ovarian cancer

There have been three instances of this cancer [42,43]. In testosterone-treated F2M, the ovaries usually increase in volume and display characteristics of polycystic ovaries [40,44], but another study disagrees [45]. Whether these changes carry a higher risk for malignant development is unknown [46].

Endometrial cancer

The role of testosterone in the pathogenesis of endometrial cancer is not clear. Endometrial atrophy has been noted in 45% of testosterone-treated F2M [40]. A single case of endometrial cancer has been reported in a F2M [47]. Administered testosterone is partially aromatized to estradiol, and estradiol unopposed by progesterone, increases the risk of endometrial cancer development. Addition of a progestin may, however, increase the risk of breast cancer [48], even in residual breast tissue [49▪]. A case of a preinvasive cervical carcinoma after performed hysterectomy has been reported [50].

Breast carcinoma

This has recently been reviewed [49▪]. In testosterone-treated F2M, there is usually a marked

reduction of glandular tissue and an increase of fibrous connective tissue [51]. However, administered testosterone is partially aromatized to estradiol and this can be a risk factor for F2M who have not undergone mastectomy. Two cases of breast cancers have been diagnosed in F2M persons who had been treated with supraphysiological doses of testosterone suggesting the possible role of testosterone in the development of breast cancer [52]. Another case has also been reported [49▪]. Another two cases are awaiting publication. Even those who have undergone mastectomy may develop cancer in residual breast tissue 10 years after the breasts were removed [53,54]. A recent study has also found an association between testosterone administration to F2M and breast cancer-related gene expression signatures [55]. It is not yet clear what the role of testosterone is in the pathogenesis of breast cancer. It may certainly have a role, especially in postmenopausal women [56], though there is not yet general agreement on this [57].

CONCLUSION

Hormonal treatment of female-to-male transsexual persons is usually uneventful. Serum testosterone kept in a male range prevents loss of bone mass. There is no increased rate of cardiovascular disease. Hormone-related cancers, though rare, may occur.

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Conflicts of interest

There are no conflicts of interest.

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CLINICAL STUDY

A long-term follow-up study of mortality in transsexuals receiving treatment with cross-sex hormones

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Abstract

Objective: Adverse effects of long-term cross-sex hormone administration to transsexuals are not well documented. We assessed mortality rates in transsexual subjects receiving long-term cross-sex hormones.

Design: A cohort study with a median follow-up of 18.5 years at a university gender clinic.

Methods: Mortality data and the standardized mortality rate were compared with the general population in 966 male-to-female (MtF) and 365 female-to-male (FtM) transsexuals, who started cross-sex hormones before July 1, 1997. Follow-up was at least 1 year. MtF transsexuals received treatment with different high-dose estrogen regimens and cyproterone acetate 100 mg/day. FtM transsexuals received parenteral/oral testosterone esters or testosterone gel. After surgical sex reassignment, hormonal treatment was continued with lower doses.

Results: In the MtF group, total mortality was 51% higher than in the general population, mainly from increased mortality rates due to suicide, acquired immunodeficiency syndrome, cardiovascular disease, drug abuse, and unknown cause. No increase was observed in total cancer mortality, but lung and hematological cancer mortality rates were elevated. Current, but not past ethinyl estradiol use was associated with an independent threefold increased risk of cardiovascular death. In FtM transsexuals, total mortality and cause-specific mortality were not significantly different from those of the general population.

Conclusions: The increased mortality in hormone-treated MtF transsexuals was mainly due to non-hormone-related causes, but ethinyl estradiol may increase the risk of cardiovascular death.
In the FtM transsexuals, use of testosterone in doses used for hypogonadal men seemed safe.

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Introduction

Psychological evaluation has shown that sex reassignment increases the well-being of transsexual subjects (1–3). Cross-sex hormone treatment has an important role in acquiring the secondary sex characteristics of the desired sex (4). Transsexuals often start taking sex hormones at young to middle age and in higher than recommended dosages. Fearing loss of secondary characteristics of the reassigned sex, transsexual subjects usually continue hormones lifelong. Previous reports from our clinic, in 1989 (5) and 1997 (6), assessed clinical endpoints, such as morbidity and mortality, in transsexuals receiving cross-sex hormones. Both these studies found no increase in mortality rates in subjects receiving cross-sex hormones compared with the general population, but reported higher than expected rates of completed suicide and death due to acquired immunodeficiency syndrome (AIDS) in male-to-female (MtF) transsexual subjects, while no increased morbidity/mortality was observed in female-to-male (FtM) transsexual subjects.

Several studies have looked at the effects of cross-sex hormone administration on laboratory variables related to cardiovascular risk in transsexuals, finding partially favorable and partially unfavorable effects (7–10). The skewed sex ratio in cardiovascular disease favoring women at all ages and the increasing incidence of cardiovascular disease after menopause were previously interpreted to indicate that estrogens are cardioprotective. By contrast, hyperandrogenemia in women is associated with increases in cardiovascular risk factors (11), which has led to the belief that androgens are detrimental to cardiovascular health (12). However, the large randomized trials (Heart and Estrogen/Progestin Replacement Study (13) and Women's Health Initiative

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(14)) refuted the cardioprotective effects of exogenous estrogens, in its generality, leading to revision of the practice of hormone replacement therapy in (post)menopausal women.

Another factor to be considered is the route of administration of estrogens, possibly having relevance for their adverse effects. Oral versus transdermal administration of 17β-estradiol (E_2) may impact differently on variables such as inflammation markers (15), lipoproteins (16), and coagulation markers (17). The pharmacological nature of the estrogen compound may be of significance too: oral administration of the synthetic compound ethinyl estradiol may have more negative effects on hemostasis than oral or transdermal E_2 (18).

This study aims primarily to describe all-cause and cause-specific mortality rates in subjects receiving cross-sex hormone treatment. This analysis extends our previous reports by assessing the effects of longer term use of cross-sex hormones in subjects treated at this clinic, increasing the accrued person-years of follow-up data from 10 152 (6) to 25 544. In addition, the effects of aging and co-morbidity have likely increased the number of endpoints, which will increase the impact and precision of the effect size measures with smaller confidence intervals (CIs); associations previously not detected due to the smaller sample size and lower power may now become apparent. We report the observed mortality rates in 1331 transsexuals followed-up for a median period of more than 18 years, and we compare the observed number of deaths with the expected number as found in the general population. In a subanalysis, the type of estrogen (i.e. oral ethinyl estradiol versus other estrogen compound and routes of administration) is analyzed in relation to the risk of cardiovascular mortality.

Subjects and methods

Baseline and follow-up data of all transsexual subjects referred to our outpatient department since 1975 were entered into a cumulative database. In the present analysis on mortality aiming to measure longer term effects, we included only subjects who had started cross-sex hormone treatment before July 1, 1997, followed-up for at least 1 year and included 2 MtF who had died the first year of hormone administration.

In total, 1331 subjects met the above inclusion criteria, 966 (72.6%) MtF transsexuals, with a mean age of 31.4 years at the start of cross-sex hormones (range: 16–76 years), with 18 678 patient-years of follow-up, and 365 (27.4%) FtM transsexuals, with a mean age 26.1 years (range: 16–57 years) at the start of hormone therapy with 6866 patient-years of follow-up. Subjects were followed-up until July 1, 2007, or until the date of death. In 2009, we could cross check our database against the National Civil Record Registry (Gemeentelijke Basis Administratie) which registers all residents in the Netherlands and, if deceased, their date of death (but not cause of death). We identified another 45 MtF and 3 FtM subjects included in our database who had died before July 1, 2007, but were unknown to us in our initial analysis on mortality based on hospital records (19). Of these additional deaths, the cause of death could be ascertained in two out of three FtM (66%), and in 27 out of 45 (60%) MtF transsexual subjects. The mean follow-up period of subjects receiving cross-sex hormones was 19.3±7.7 years (median 18.6, range 0.7–44.5 years) in the MtF group. In the FtM group, the follow-up was 18.8±6.3 years (median 18.4, range 4.7–42.6 years; Table 1).

The cause of death was ascertained by medical report or information from the family physician and was coded according to the International Classification of Disease (ICD-10, 10th revision 2007; www.who.int/classification/icd10online). When initiating sex reassignment treatment, all subjects had agreed that their data could potentially be used in future scientific analysis with the provision that data could not be related to an individual person.

Hormone treatment

In MtF transsexuals, hormone treatment before sex reassignment surgery consisted of estrogens combined with anti-androgens. Until 1989, mainly ethinyl estradiol was prescribed in a dose of 100 μg/day, and

Table 1 Baseline and treatment-related characteristics of 1331 male-to-female and female-to-male transsexuals who underwent cross-sex hormone treatment.

	Male-to-female transsexuals	Female-to-male transsexuals
n	966	365
Age at start (mean±S.D.)	31.4±11.4	26.1±7.6
Range (years of age)	16–76	16–56
Age groups (*n* (%))		
15–24	329 (34.1)	204 (55.9)
25–39	429 (44.4)	145 (39.7)
40–64	199 (20.6)	16 (4.4)
65–80	9 (0.9)	0
Smoking status (*n* (%))		
Never	254 (26.3)	94 (25.8)
Current	373 (38.6)	131 (35.9)
Former or unknown	339 (35.1)	140 (38.3)
Starting date before 1990 (*n* (%))	619 (64.2)	197 (54.0)
Sex reassignment surgery (*n* (%))	834 (86.7)	343 (94.0)
Follow-up on hormone treatment (years±S.D.)	19.4±7.7	18.8±6.3
<5 years (*n* (%))	22 (2.2)	1 (0.3)
5–10 years (*n* (%))	50 (5.2)	6 (1.6)
10–15 years (*n* (%))	229 (23.7)	111 (30.4)
15–20 years (*n* (%))	252 (26.1)	99 (27.2)
20–25 years (*n* (%))	190 (19.7)	86 (23.5)
25–30 years (*n* (%))	131 (13.6)	43 (11.8)
>30 years (*n* (%))	92 (9.5)	19 (5.2)

only small numbers of patients used estrogen injections or other oral estrogen compounds, such as conjugated estrogens. But after publication of an elevated risk of venous thrombosis associated with ethinyl estradiol use (5), particularly in patients over 40 years of age, we started to recommend transdermal E_2 to all MtF, particularly to those over 40 years of age. In those MtF who did not tolerate or refused transdermal estrogens, oral estradiol valerate 2–4 mg/day was prescribed. However, some subjects were reluctant to change their previous estrogen therapy and continued with ethinyl estradiol.

Before surgical sex reassignment in MtF transsexuals (which includes orchiectomy), estrogens were always combined with anti-androgen treatment (usually cyproterone acetate 100 mg/day and spironolactone 100–200 mg/day in $<5\%$ of MtF) to decrease testosterone levels and/or block androgen action. In the period before we started to advice not to use ethinyl estradiol, the standard practice was to reduce the dose of ethinyl estradiol to 50 μg/day after surgery, or estrogen treatment was changed to transdermal or oral E_2. Furthermore, anti-androgens were discontinued, but about 30% of the MtF subjects experienced regrowth of undesired (facial) hair to some extent and asked for continuation of anti-androgens, though in significant lower doses.

FtM transsexuals were prescribed testosterone as esters intramuscularly 250 mg/2 weeks, reduced postoperatively to every 3 weeks, oral testosterone undecanoate 160–240 mg/day (Andriol, not available in the USA) and, more recently, transdermal testosterone 50 mg/day. If uterine bleeding persisted, a progestin was added until hysterectomy, usually lynestrenol.

It is of note that the Dutch health care system fully covers sex reassignment treatment, with the result that almost all transsexual subjects have undergone sex reassignment surgery 2 years after starting cross-sex hormones. Consequently, the observed effects of sex hormones on biological systems in this study are largely attributable to exogenous hormones.

Statistical analysis

The observed number of deaths in the study population was set against the expected numbers of deaths (except from AIDS and drug abuse) derived from the 2001 mortality data of the general population provided by the Central Bureau of Statistics of the Netherlands (Centraal Bureau voor Statistiek on www.statline.cbs.nl) stratified per age group (i.e. 15–24; 25–39; 40–64; and 65–80 years of age) and biological sex. Numbers of deaths were adjusted for the years of follow-up on cross-sex hormone treatment. Expected number of deaths from AIDS and drug abuse, which varied largely from year to year, was calculated from specific reports by Statistics Netherlands. The risk was expressed as standardized mortality ratio (SMR), and the 95% CIs were calculated by regarding the observed number as a Poisson variable with tables based on Poisson distribution (20).

In a subanalysis, the association of use of ethinyl estradiol to mortality was analyzed. The use of ethinyl estradiol (dichotomized into i) never or former users during hormone administration, and ii) ongoing users) was analyzed in relation to all-cause mortality, cardiovascular mortality, mortality due to external causes, cancer mortality, and non-cardiovascular mortality in 964 MtF transsexuals. The never/former users were combined into one reference group, as the risk of cardiovascular death was not increased in former versus never users of ethinyl estradiol. The potentially mediating or confounding variables such as age, smoking status, and starting date before 1990 were adjusted for Cox proportional hazards models by incrementally including them as covariates. The associations of different groups of ethinyl estradiol use and mortality were explored by selecting the first group (i.e. never or former users of ethinyl estradiol) as the reference category (i.e. a hazard ratio of 1). The software used was SPSS version 17.0 (SPSS, Inc., Chicago, IL, USA).

Results

Baseline characteristics

Baseline data and duration of follow-up in the patient groups are shown in Table 1. MtF transsexual subjects were older when they started cross-sex hormones (31.4 ± 11.4 years) than FtM (26.1 ± 7.4 years; $P<0.001$). In the MtF group, 207 subjects (21.4%) were over 40 years of age, and nine subjects (0.9%) were even over 65 years of age, whereas only few FtM ($n=16$, 4.4%) were over 40 years of age at the start of cross-sex hormone treatment. The mean duration of follow-up was not significantly different between MtF and FtM subjects (19.4 ± 7.7 vs 18.8 ± 6.3 years; $P=0.12$). The rate of sex reassignment surgery (defined as orchiectomy/penectomy + vaginoplasty in MtF and extirpation of the internal genitalia with both ovaries in FtM) was significantly lower in MtF compared to FtM subjects (86.7 vs 94.0%, $P<0.001$).

Mortality rates in MtF transsexuals

In the MtF group, 122 (12.6%) out of 966 subjects had died during follow-up. When compared with the adjusted expected mortality in the general population, MtF had a significantly increased mortality with a SMR of 1.51 (95% CI: 1.47–1.55; Table 2). The increased mortality in MtF in the 25–39 years of age group (SMR 4.47; 95% CI: 4.04–4.92) was mainly due to the relatively high numbers of suicides (in six), drugs-related death (in four), and death due to AIDS (in 13 subjects).

In 40–64 year age group, the SMR of total mortality was increased with 1.42 (95% CI: 1.35–1.48).

Table 2 SMR adjusted for age and period of follow-up on hormone treatment by biological sex in 1331 male-to-female and female-to-male transsexual subjects.

	Male-to-female transsexuals		Female-to-male transsexuals	
Cause of death	Observed cases	SMR (95% CI)	Observed cases	SMR (95% CI)
Malignant neoplasm	28	0.98 (0.88–1.08)	5	0.99 (0.65–1.44)
Lung	13	1.35 (1.14–1.58)	1	1.06 (0.26–3.19)
Digestive tract	3	0.42 (0.28–0.60)	2	2.41 (0.90–5.18)
Hematological	6	2.58 (1.97–3.30)	1	2.86 (0.69–8.57)
Brain	2	1.59 (0.95–2.46)	0	–
Other: kidney, melanoma, bone, and prostate in MtF. In FtM: leiomyosarcoma	4	0.79 (0.57–1.07)	1	0.77 (0.25–1.77)
Ischemic heart disease	18	1.64 (1.43–1.87)	1	1.19 (0.39–2.74)
Cerebrovascular accidents	5	1.26 (0.93–1.64)	0	–
AIDS	16	30.20 (26.0–34.7)	0	–
Endocrine/diabetes	2	0.85 (0.41–1.32)	0	–
Respiratory system diseases	4	0.85 (0.61–1.14)	0	–
Digestive system diseases	3	1.01 (0.68–1.45)	1	2.56 (0.62–7.69)
Genitourinary system disease (ESRD)	1	1.21 (0.58–2.17)	0	–
Nervous system disease (MS)	0		1	3.57 (0.86–10.7)
External causes	24	7.67 (6.84–8.56)	2	2.22 (1.07–5.44)
Illicit drugs use	5	13.20 (9.70–17.6)	1	25.00 (6.00–32.5)
Suicide	17	5.70 (4.93–6.54)	1	2.22 (0.53–6.18)
Unknown/ill-defined symptoms	21	4.00 (3.52–4.51)	2	2.08 (0.69–4.79)
Total	122	1.51 (1.47–1.55)	12	1.12 (0.89–1.59)

ESRD, end-stage renal disease; MS, multiple sclerosis.

The higher rate as compared with the general population was largely explained by eight suicides (where only one was expected on the basis of mortality data in the general population) and 17 deaths from cardiovascular diseases (where only eight were expected). In the relatively small MtF group over 65 years of age, total mortality was not increased (SMR 0.95, 95% CI: 0.86–1.06) as compared to the general population.

In MtF, ischemic heart disease was the cause of death in 18 subjects (SMR 1.64; 95% CI: 1.43–1.87). The mean age of occurrence of the lethal ischemic cardiac event was 59.7 years (range: 42–79 years). The mean duration of estrogen use was 13.2 years (range: 2–42 years). Eleven of them (61%) had been using ethinyl estradiol during a mean period of 9.7 years (range: 2–16 years), whereas the other seven had used transdermal estrogen ($n=2$), stilbestrol ($n=1$), tibolon ($n=1$), or conjugated estrogens ($n=3$) for a mean period of 16.9 years (range: 5–42 years). The mean age at the start of estrogen treatment was 45.9 years (range: 18–70 years), 46.5 years in ethinyl estradiol users, and 44.9 years in users of other estrogens. Nine (50%) of the deceased subjects were current smokers, two non-smokers, and seven former smokers or unknown. Four (22%) had hypercholesterolemia (>6.5 mmol/l or >250 mg/dl). Four (22%) had been diagnosed earlier with venous thrombosis, and five (28%) had suffered a previous myocardial infarction.

Five MtF subjects died from stroke (SMR 1.26; 95% CI: 0.93–1.64). Two subjects died before the age of 60, and the other three subjects died when they were 60, 62, and 75 years old; therefore, in 40–64 years of age, the SMR for fatal stroke was 2.11 (95% CI: 1.32–3.21). All had been using ethinyl estradiol, and in only one of the two who had suffered a previous transient ischemic attack, the treatment regimen had been changed to transdermal estrogen.

In the Cox proportional hazard analysis of the type of estrogen treatment in MtF, current use of ethinyl estradiol was significantly associated with cardiovascular mortality, but not with an increased risk of all-cause mortality or mortality due to other causes. The threefold increased hazard ratio of cardiovascular mortality in current users compared with never and former users of ethinyl estradiol remained significant after adjustment for covariates (Table 3).

In the MtF group, the observed total number of deaths due to malignant neoplasm ($n=28$) was not increased compared with the general population, but lung cancer ($n=13$) showed a statistically significant increased SMR of 1.35 (95% CI: 1.14–1.58). The risk of leukemia/lymphoma with six deaths (one acute myeloid leukemia, one chronic lymphoid leukemia, one unclassified leukemia, and three non-Hodgkin lymphomas) was significantly increased with a SMR of 2.66 (95% CI: 1.93–3.60).

External causes of death were increased almost eightfold due to suicide and illicit drug use. The suicide rate in MtF was increased sixfold. Thirteen out of the seventeen (76%) had received psychiatric treatment in the past. No suicides occurred within the first 2 years of hormone treatment, while there were six suicides after 2–5 years, seven after 5–10 years, and four after more than 10 years of cross-sex hormone treatment at a mean age of 41.5 years (range 21–73 years).

Table 3 Hazard ratios (95% CIs) of mortality according to the use of ethinyl estradiol in 964 male-to-female transsexuals during a median of 18.6 years of follow-up. Two deaths within the first year of follow-up were excluded to reduce the chance of reverse causation. Cardiovascular mortality was defined as death due to myocardial infarction or stroke.

	Use of ethinyl estradiol		
	Never or former use	Continuous use	***P* value**
No. of male-to-female transsexuals	596	368	
All-cause mortality	69 (11.6%)	51 (13.9%)	
Crude	1.00	1.13 (0.78–1.62)	0.53
Adjusted for age and smoking	1.00	1.33 (0.92–1.92)	0.13
Fully adjusted[a]	1.00	1.28 (0.88–1.86)	0.20
Cardiovascular mortality	8 (1.3%)	15 (4.1%)	
Crude	1.00	2.82 (1.19–6.65)	0.02
Adjusted for age and smoking	1.00	3.64 (1.52–8.73)	0.004
Fully adjusted[a]	1.00	3.12 (1.28–7.63)	0.01
Mortality due to external causes[b]	12 (2.0%)	11 (3.0%)	
Crude	1.00	1.40 (0.62–3.17)	0.43
Adjusted for age and smoking	1.00	1.44 (0.63–3.30)	0.38
Fully adjusted[a]	1.00	1.36 (0.60–3.10)	0.46
Cancer mortality	17 (2.9%)	11 (3.0%)	
Crude	1.00	0.99 (0.46–2.12)	0.98
Adjusted for age and smoking	1.00	1.24 (0.57–2.67)	0.59
Fully adjusted[a]	1.00	1.35 (0.61–3.00)	0.46
Non-cardiovascular mortality	46 (7.7%)	30 (8.2%)	
Crude	1.00	1.00 (0.63–1.59)	0.99
Adjusted for age and smoking	1.00	1.16 (0.73–1.84)	0.54
Fully adjusted[a]	1.00	1.15 (0.71–1.83)	0.58

P values using Cox proportional hazards models.
[a]Adjusted for age, smoking status, and a starting date before 1990 (because before 1990, ethinyl estradiol was the standard estrogen prescribed).
[b]Deaths due to accidents, intentional self-harm and suicide, assault, drugs, and adverse effects.

Five (1.6%) suicides were observed among the 304 MtF who were still using cyproterone acetate and 12 (1.8%) in the group of MtF no longer using cyproterone acetate. Six MtF subjects who committed suicide (35%) had not undergone sex reassignment surgery because there had been doubts about their mental stability. In the whole group of MtF subjects, 87.6% underwent sex reassignment surgery.

Also death due to illicit drug use ($n=5$) was relatively increased (SMR 13.2; 95% CI: 9.7–17.6). All had been past or current substance abusers before the start of hormone treatment but had been evaluated as sufficiently mentally stable to undergo hormone treatment. Sixteen MtF transsexual subjects died from AIDS between 1986 and 2006 (SMR 30.2; 95% CI: 26.0–34.7). The underlying cause of death could not be ascertained in 21 (17.2%) of the 122 subjects who had died.

Mortality rates in FtM transsexuals

In the FtM group, 12 out of 365 (3.4%) died during follow-up. When compared with the adjusted expected mortality in the general population, in FtM, the SMR of 1.12 (95% CI: 0.87–1.42) was not significantly increased (Table 2). Compared with the MtF population, actual numbers were lower in the FtM group, which resulted in large CIs of the point estimates. The FtM group was also on average of younger age (only six over 65 years of age) compared to the MtF group. Only one myocardial infarction was observed in a 72-year-old FtM subject after 42 years of testosterone treatment. External causes of death were increased due to one death by illicit drug abuse, a cause of death extremely rare in the reference group of the female general population. Total number of cancer deaths was not different from the expected number. No deaths due to breast cancer was observed, and other cancer death categories were not statistically significantly different from those expected, but again this has to be set against larger CIs.

Discussion

In this large cohort with a median follow-up of more than 18 years, we observed in MtF transsexual subjects a 51% relatively increased mortality rate compared with the general male population, mainly due to increased rates of death from suicide, illicit drugs, AIDS, cardiovascular disease, and unknown causes. In FtM transsexuals, the observed mortality rate was not significantly increased compared with women in the general population. However, it should be taken into consideration that FtM started cross-sex hormones (testosterone) at a younger age than MtF (at mean age 26.1 years compared with MtF at age 31.1 years), and rarely started treatment after the age of 40. The effects of aging may thus carry less weight in the FtM group (also smaller) than the MtF group. Follow-up of FtM in

the 65–79 years of age group was only 35.4 patient years, implying that no firm conclusions can be drawn in this FtM age group nor in the FtM group as a whole.

The increased mortality risk in MtF in our cohort was characterized by a high SMR of suicide (of 5.70), AIDS (of 30.2), and illicit drug-related deaths (of 13.2). In our previous publication, the increased mortality rates due to suicide and AIDS had already been noted (6). Depressive mood changes have been reported in cyproterone acetate use but these are usually transient occurring during the first 6 months of use. No association of suicide with actual use of cyproterone acetate could be established. The main benefit of 50–100 mg/day cyproterone acetate before surgery is the effective suppression of testosterone levels and counteracting the biological action of androgens, allowing the use of estrogens in a lower dosage and a more potent biological action, particularly on breast tissue. Psychological evaluation has shown that sex reassignment increases the well-being of transsexuals, but it should not be considered as a cure-all; it is rehabilitative relieving gender dysphoria, but some transsexual subjects may still experience other problems (e.g. comorbid psychiatric problems, social isolation, troubled relationships, prejudice, and discrimination).

Our present analysis, as compared to our earlier reports, comprises a larger study population and a longer follow-up, resulting in a more apparent increased mortality rate of cardiovascular disease in MtF. This may be partially explained by heavier smoking and a higher incidence of hypercholesterolemia in MtF than in the male general population. Moreover, long-term ethinyl estradiol use was independently associated with a threefold increased risk of cardiovascular death. Our findings in 1989 (5) of an increased incidence of venous thrombosis associated with the use of ethinyl estradiol had already led to a change in type of estrogen prescription for new patients starting cross-sex hormones, and nowadays only few MtF use ethinyl estradiol or other oral estrogens in high dose. The increased risk of cardiovascular mortality was observed only in those who were still using ethinyl estradiol. No increased risk was found in former users who had changed to other formulations and lower doses of estradiol. This is reassuring for those who have changed to other estrogen preparations. The increased risk with ethinyl estradiol can possibly be explained by the thrombogenic hemostatic changes: a large increase in APC resistance and a decrease in plasma protein S that have been previously described by our group (13). The high prevalence of previous venous thrombosis (22%) in those who died from cardiovascular causes supports this hypothesis. The favorable serum lipid changes associated with ethinyl estradiol (7) – an increase in high-density lipoprotein cholesterol (+20%) and a decrease in low-density lipoprotein cholesterol (−12%) – did apparently not translate into a reduced risk of cardiovascular death. Recently, raised levels of circulatory inflammatory markers in transsexuals treated with high dose of oral estrogens have been reported, which could further contribute to the increased cardiovascular risk (10). An increased risk of cardiovascular disease was also reported in women using oral contraceptives (OC), in particular if they used OC pills with a higher ethinyl estradiol content (50 μg), even more so when they were smokers (21–23). The increased risk, however, disappeared after discontinuing OC use (24). In those MtF who had continued using ethinyl estradiol, subjects had used equally relatively high doses of about 50 μg/day up to advanced age, which could explain our finding of an increased rate of cardiovascular death.

The total cancer mortality rate was not increased. The statistically significant increase in mortality rate of lung cancer may be related to heavier smoking in the transsexual population. The increased mortality rate due to a variety of hematological cancers is puzzling. There are no reports of associations of hematological cancers with use of sex hormones. This may be a chance finding, or may be explained by the association of non-Hodgkin lymphomas with HIV, the latter might have gone unreported. The decreased mortality rate for colon cancer, also observed in the Women's Health Initiative (14), is similarly remarkable, but also this needs confirmation in further studies. We did not observe any cases of breast cancer in the population studied, neither in MtF nor in FtM, in agreement with the low prevalence of breast cancer in the literature.

Our study has a number of limitations inherent in a cohort study. Firstly, it was not randomized nor placebo-controlled which would have been difficult, if not impossible given the nature of the study population. Comparing our cohort with the general population was probably the best available option for this research but it should be noted that this comparison is potentially biased and confounded by lifestyle factors, prone to associated pathology and other factors specific for the transsexual population besides cross-sex hormone treatment. Transsexual subjects, in particular MtF, differed in a number of regards with the general population. Before they presented themselves for sex reassignment, they have an increased history of suicide attempts, more psychopathology, and substance abuse, probably associated with the psychological burden of gender dysphoria, as well as an increased prevalence of HIV infection. Secondly, the data have been collected over a 30-year period, and follow-up was not entirely complete, 40% of the subjects had their last visit to the clinic before 2007. Our cross check with the Dutch civil registry in 2009 confirmed this assumption.

In summary, increased mortality in hormone-treated MtF transsexuals was mainly due to non-hormone-related causes, such as suicide, AIDS, and drug abuse, but current use of ethinyl estradiol was associated with an increased risk of cardiovascular death. In FtM transsexuals, the use of testosterone in doses similar

to those used for replacement for hypogonadal men seemed safe, but our data in over 65-year-old FtM were limited. In line with the Endocrine Society's Clinical practice guidelines on Endocrine Treatment of Transsexual Persons (25), we strongly recommend not to prescribe ethinyl estradiol (or OC, often self-administered in higher dosages) to MtF transsexuals. Transdermal and low dose oral estradiol combined with anti-androgens are effective with fewer side effects in our experience and as published by others (26, 27). Consequently, since ethinyl estradiol is no longer used in our clinic since 2001, there is no indication to routinely test asymptomatic MtF before initiation of cross-sex therapy for (inherited) forms of thrombophilia (27), as long as the subject's history does not suggest any additional risk (25).

Lifestyle behaviors, which include healthy diets, smoking cessation, and regular exercise, may help to reduce cardiovascular risk especially in the group of MtF. Furthermore, intense preventive action may help reduce the mortality from suicide, AIDS, and drug abuse.

Declaration of interest

The authors declare that there is no conflict of interest that could be perceived as prejudicing the impartiality of the research reported.

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REVIEW ARTICLE

Effect of sex steroid use on cardiovascular risk in transsexual individuals: a systematic review and meta-analyses

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Summary

Objective To summarize the available evidence on the cardiovascular effects of cross-sex steroid use in transsexuals.

Methods We searched relevant electronic databases and sought additional references from experts. Eligible studies reported on cardiovascular events, venous thromboembolism, blood pressure and fasting serum lipids. Data were extracted in duplicate. We used the random-effects model to estimate the pooled weighted mean difference (WMD) and 95% confidence intervals (CIs).

Results We found 16 eligible studies, mostly uncontrolled cohorts of varied follow-up durations (1471 male-to-female (MF) and 651 female-to-male (FM) individuals). In the MF individuals, cross-sex hormone use was associated with a statistically significant increase in fasting serum triglycerides without changes in the other parameters (WMD = 23·39 mg/dl; 95% CI = 4·82–41·95). In the FM individuals, there was a similar increase of triglycerides (WMD = 31·35 mg/dl; 95% CI = 7·53–55·17) and a reduction of high density lipoprotein (HDL)-cholesterol (WMD = −6·09 mg/dl; 95% CI = −11·44 to −0·73). There was a statistically significant but clinically trivial increase in systolic blood pressure (WMD = 1·74 mmHg; 95% CI = 0·21–3·27). Analyses were associated with significant heterogeneity across studies. There were very few reported cardiovascular events (deaths, strokes, myocardial infarctions or venous thromboembolism), more commonly among MF individuals.

Conclusions Very low quality evidence, downgraded due to methodological limitations of included studies, imprecision and heterogeneity, suggests that cross-sex hormone therapies increase serum triglycerides in MF and FM and have a trivial effect on HDL-cholesterol and systolic blood pressure in FM. Data about patient important outcomes are sparse and inconclusive.

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Introduction

Gender identity disorder (GID) affects individuals preoccupied with their wish to live as members of the opposite sex. Such individuals intensely desire to adopt the social role of the other sex or to acquire the physical appearance of the other sex through hormonal or surgical manipulation.[1] Sex reassignment therapy seeks to achieve this transition using a multi-modality approach that often includes psychological, hormonal and surgical interventions.[2] Men seeking transition to the female sex (MF) generally use oestrogen, antiandrogens (cyproterone acetate, spironolactone) or a gonadotropin-releasing hormone agonist (GnRH agonists). Women seeking transition to the male sex (FM) generally use testosterone.[3]

It is plausible that sex steroid use may be associated with potential adverse effects such as acne, venous thromboembolism, atherosclerosis, hypertension, hyperlipidemia, prostate hyperplasia; and may cause or exacerbate neoplasia of the prostate, breast and ovaries.[3,4] Two large randomized trials characterized the effect of oestrogen-containing hormonal use on cardiovascular risk in women,[5,6] and the Coronary Drug Project evaluated this therapy in men post-myocardial infarction.[7] A recent review reported on the weak available evidence linking testosterone use with cardiovascular risk in hypogonadal and eugonadal men,[8] a finding that was echoed in the recently published Endocrine Society guidelines for androgen use in women, in which the panel described limited evidence regarding the cardiovascular safety of low-dose testosterone use in women with presumed androgen deficiency.[9] The different characteristics of the patients and of the hormone schedule in these trials mean these studies apply only indirectly to sexual steroid use in transsexual individuals.

In this systematic review, we sought to summarize the available evidence of the effects of cross-sex hormone use on the cardiovascular risk of transsexual individuals. Outcomes of interest were cardiovascular events, venous thromboembolism, fasting serum lipid fractions and blood pressure.

Methods

This report adheres to the standards of reporting of Meta-analysis Of Observational Studies in Epidemiology.[10]

National Coverage Determination (NCD) for Transsexual Surgery (140.3)

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Tracking Information

Publication Number	Manual Section Number	Manual Section Title
13-3	140.3	Transsexual Surgery

Version Number	Effective Date of this Version
1	This is a longstanding national coverage determination. The effective date of this version has not been posted.

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Description Information

Benefit Category
Physicians' Services

Note: This may not be an exhaustive list of all applicable Medicare benefit categories for this item or service.

Item/Service Description
Transsexual surgery, also known as sex reassignment surgery or intersex surgery, is the culmination of a series of procedures designed to change the anatomy of transsexuals to conform to their gender identity. Transsexuals are persons with an overwhelming desire to change anatomic sex because of their fixed conviction that they are members of the opposite sex. For the male-to-female, transsexual surgery entails castration, penectomy and vulva-vaginal construction. Surgery for the female-to-male transsexual consists of bilateral mammectomy, hysterectomy and salpingo-oophorectomy, which may be followed by phalloplasty and the insertion of testicular prostheses.

Indications and Limitations of Coverage
Transsexual surgery for sex reassignment of transsexuals is controversial. Because of the lack of well controlled, long term studies of the safety and effectiveness of the surgical procedures and attendant therapies

for transsexualism, the treatment is considered experimental. Moreover, there is a high rate of serious complications for these surgical procedures. For these reasons, transsexual surgery is not covered.

NHS England

Interim Gender Dysphoria Protocol and Service Guideline 2013/14

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Description	This Protocol addresses the significant variations in equity of access currently experienced by patients using gender identity services. It will achieve national consistency and safe delivery of services and has been introduced to allow time to develop and consult on a new commissioning policy and service specification in 2014
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Interim Gender Dysphoria Protocol and Service Guideline 2013/14

Approved by the Clinical Priorities Advisory Group (CPAG) on 12 July 2013

Contents

Interim NHS England Gender Dysphoria Protocol and Service Guideline 2013/14

1. Introduction

In 2012/13, NHS England's Clinical Reference Groups (CRGs) were asked to develop a number of draft service specifications and commissioning policies, to support the nationally consistent commissioning of specialised services across the country. These service specifications and commissioning policies were subject to a short public consultation. Feedback received during this consultation was used to further develop the specifications and policies for use in contracting with providers.

NHS England was unable to recommend adoption of the specifications and commissioning policies developed by the former Gender Services CRG (2012-13) because of the volume of feedback received in relation to those documents, in particular relating to equality and equity of access issues. At its March 2013 meeting, the Clinical Priorities Advisory Group (CPAG) supported the recommendation to not adopt the gender identity commissioning policy and specifications. NHS England has committed to a programme of work, led by Professor Steve Field and the equalities directorate, to address the inequality issues raised during consultation. The development of this protocol, to ensure consistent commissioning, is the first output from this piece of work, and specifically addresses equity of access. NHS England has used the widely consulted Scottish Protocol as the basis of this interim approach. This was to ensure a safe starting point where consensus could be established.

This protocol and guideline document is the culmination of extensive work to adapt the Scottish protocol so that it fits with NHS England structures; to ensure it meets the needs of patients; and establishes the right checks and balances to ensure safe delivery through the NHS commissioned services. Two stakeholder events were held in London in June, involving both patients and non-service related stakeholders, and separately with clinicians and services, in order that facilitated and honest debate could take place on the proposed document. The outputs of those events have been considered and included in the document.

The purpose of the interim protocol and guideline is to bridge the time period between the present, fragmented commissioning and provision of these services, and an agreed NHS England policy and service specification that will be developed through the CRG in the coming months in readiness for the 2014/15 contracting round. It will provide interim consistency, equality and equity of access across the country and drive out the significant variation currently experienced by patients.

There will be a financial impact should the interim protocol and guideline be adopted but this relatively small unit cost for a small cohort of patients relates in the main to Facial Hair Reduction for male to female transition.

2. Equality Statement

Throughout the production of this document, due regard has been given to eliminate discrimination, harassment and victimisation, to advance equality of opportunity, and to foster good relations

between people who share a relevant protected characteristic (as cited in under the Equality Act 2010) and those who do not share it.

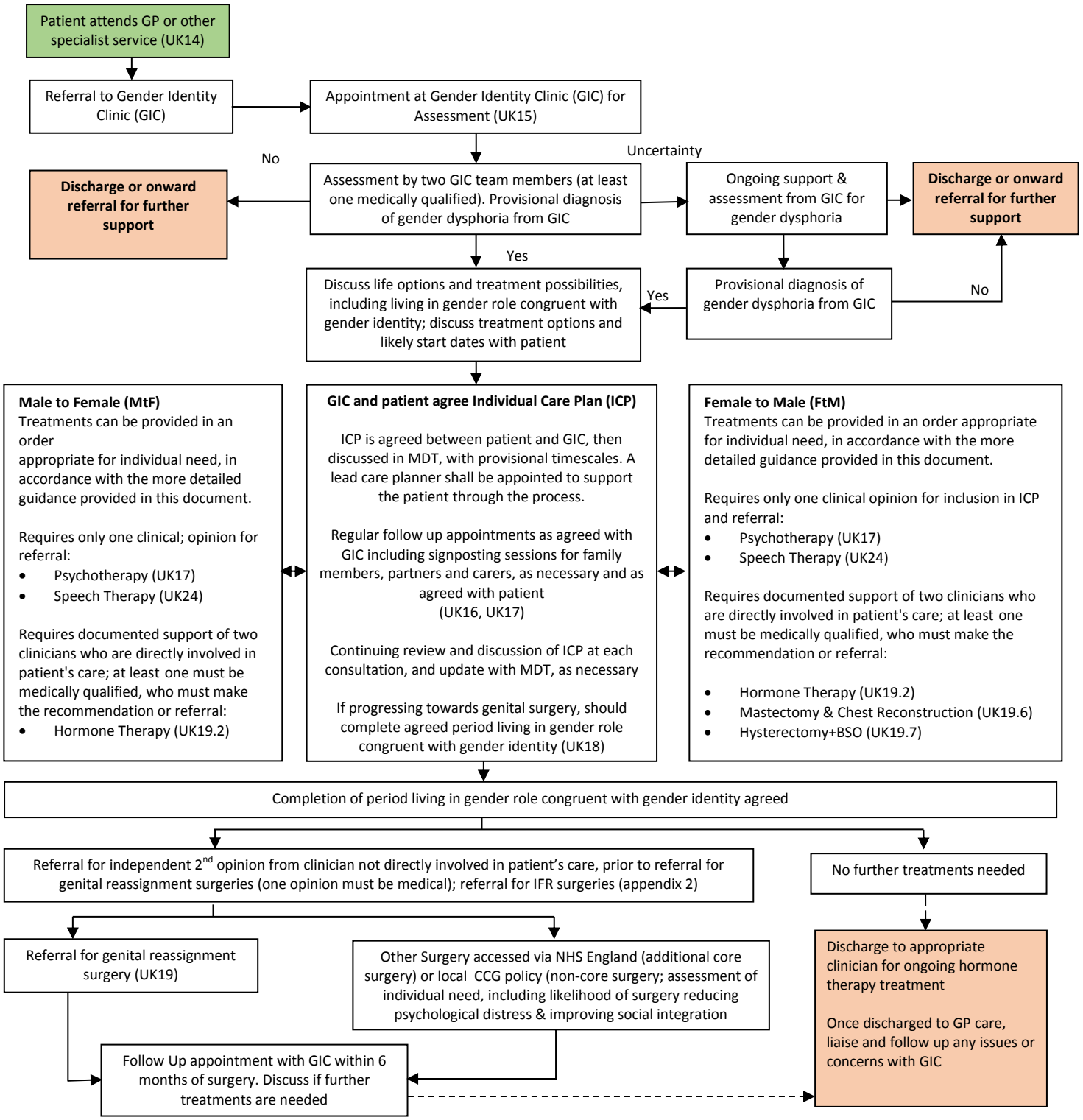
3. The Protocol

This interim Protocol and Service Guideline for Gender Identity Services commissioned by NHS England is largely derived from the 2012/13 NHS Scotland Protocol & Service Specification. It is intended for implementation from July 2013 and will, in due course, be superseded by a definitive English policy and services specification, based upon the recommendations of the Clinical Reference Group for Gender Identity Services. The protocol was approved at the Clinical Priorities Advisory Group (CPAG) meeting 12th July 2013. There was a delay in publishing as we awaited the release of the UK Intercollegiate Good Practice Guidelines for the Assessment and Treatment of Adults with Gender Dysphoria, which was released by The Royal College of Psychiatrists on the 25th October 2013.

This document should be used in conjunction with the UK Intercollegiate *Good Practice Guidelines for the Assessment and Treatment of Adults with Gender Dysphoria* and is cross-referenced to its relevant sections. It should be interpreted and implemented in a manner that is consistent with the UK Intercollegiate *Good Practice Guidelines*. This document is not intended to be exhaustive in content; issues not covered in this document should be managed in accordance with the UK Intercollegiate *Good Practice Guidelines*.

3.1 Protocol Flow Chart

When implementing the protocol, the patient should be a full participant in decisions about their healthcare and wellbeing and be given any information or support that they need in order to do so.



3.2 Protocol Notes

1. Transsexualism is the desire to live and be accepted as a member of the opposite sex, usually accompanied by the wish to make his or her body as congruent as possible with the preferred sex through surgery and hormone treatment (ICD-10 code F64.0).

2. Gender dysphoria refers to discomfort or distress that is caused by a discrepancy between a person's gender identity and that person's sex assigned at birth (and the associated gender role and/or primary and secondary sex characteristic).[1] Trans and gender variant people are not necessarily gender dysphoric.

3. Patients with atypical gender identity development but not diagnosed with gender dysphoria will be supported on to a treatment pathway appropriate to their need by the Gender Identity Clinic (GIC).

4. Some, but not all, patients may require formal psychiatric intervention to assist with psychiatric comorbidities and in such cases shared care may be appropriate.

5. Assessment, diagnosis and confirmation of gender dysphoria must be by a health professional who specialises in gender dysphoria and has general clinical competence in diagnosis and treatment of mental or emotional disorders, for example psychiatrists and psychologists. (Refer to page 22 of WPATH Standards of Care, V7 for further information)[2]

6. NHS England may commission a specialised Gender Identity Clinic (GIC) service from providers able to deliver the range of multi-disciplinary services described in this document, and offer effective and high-quality care for gender dysphoria. Historically, such services have been single-centre, consultant-led, multidisciplinary teams but other models, for example multi-centre, multi-disciplinary clinical networks involving General Practitioners with special interest in gender dysphoria, are not excluded. However, it is a requirement that both single-centre and multi-centre clinical network providers:

    - Have an effective multi-disciplinary team (MDT) that meets regularly, either in person or through electronic communication
    - Deliver patient care that is based upon individual care plans that are agreed and reviewed by the provider's multi-disciplinary team (MDT)
    - Are able to offer the complete range of multi-disciplinary services described in this document
    - Are able to meet team member training and quality standards that will be determined from time to time by NHS England.

7. A period of living in the gender role that is congruent with the individual's gender identity (sometimes called "real-life experience") *before* the provision of genital

[1] The World Professional Association for Transgender Health (WPATH) Standards of Care for the Health of Transsexual, Transgender, and Gender Nonconforming People, 7th version, September 2011 (page 5), http://www.wpath.org/
[2] Ibid, (page 22)

reassignment surgery is required by authoritative guidelines; this is described in Appendix 1 below. The duration of this period is typically 12 to 24 months [UK18.3].

8. At the beginning of the period of living in the gender role that is congruent with the individual's gender identity, the GIC and patient should discuss the practicalities and requirements of the experience and details of patient and family support mechanisms as well as the possible treatments available.

9. The period of living in the gender role that is congruent with the individual's gender identity can be extended if the GIC and / or patient feel that further time is needed or if attendance at the clinic is inconsistent.

10. A lead professional will be named on all individualised care plans developed, to provide a link for the patient to the GIC and to ensure follow up of all patients at appropriate intervals. This individual will also ensure that the patient receives appropriate after care.

11. Throughout the process of gender reassignment all treatments, procedures, access criteria, associated risks and expectations should be clarified with the patient. An individualised programme of information provision, services, treatment, and surgery as appropriate to the person's individual needs and situation should be discussed and agreed as the patient progresses through the period of living in the gender role that is congruent with the individual's gender identity. Treatment can be reviewed and modified by agreement of those involved.

12. Patients who elect not to have surgery can continue on hormone therapy. This may be supervised by specialist endocrinologists or gynaecologists if this supervision is available. The appropriate clinician should assume responsibility for continued prescribing of hormone therapy (with support as required from the GIC). GICs should ensure that GPs are aware of the hormone management guidelines as detailed in the protocol. In cases where there is uncertainty about the stability of the patient's gender role, gender specialists should consider offering regular (e.g. annual) review appointments.

13. Surgical providers should inform primary care medical and nursing staff of the nature of the procedure, anticipated post-operative care needs, common complications and contact details of the surgical team and associated nursing staff (who provide post-operative care to local patients) as may be clinically appropriate. Good communication is necessary to optimise patient experience and promote a seamless transition from surgical unit to primary care-based care. Hair removal, by laser depilation or electrolysis, at tissue donor sites for genital surgery will be arranged according to guidance from or recommendations of the surgical provider.

14. All patients who have surgery should be offered an appointment with the GIC after surgery according to clinical need and within 6 months of surgery to discuss any issues and be provided with a post-operation plan. Information regarding the procedures and post-operation plan should be made available to primary care staff, including district and practising nursing staff. This should also be provided for the patient's GP.

Appendix 1 – The requirement for a period of living in the gender role that is congruent with the individual's gender identity before genital reassignment surgery (sometimes called "Real Life Experience")[3]

The rationale for a period of living in the gender role that is congruent with the individual's gender identity before genital reassignment surgery, living in an identity-congruent gender role is based on expert clinical consensus that this experience provides ample opportunity for patients to experience and socially adjust in their desired gender role, before undergoing irreversible surgery.

The social aspects of changing one's gender role are usually challenging – often more so than the physical aspects. Changing gender role can have profound personal and social consequences, and the decision to do so should include an awareness of what the familial, interpersonal, educational, vocational, economic, and legal challenges are likely to be, so that people can function successfully in their gender role. Support from the Gender Identity Clinic and from peers can be invaluable in ensuring a successful gender role adaptation.

The duration of this period for at least 12 months allows for a range of different life experiences and events that may occur throughout the year (e.g., family events, holidays, work or school experiences). During this time, patients should present consistently, on a day-to-day basis and across all settings of life, in their desired gender role. This includes coming out to partners, family, friends, and community members (e.g., at school, work, other settings).

The GIC should clearly document a patient's experience in the gender role in their medical records, including the start date of living in their chosen gender role. Patients will be required to provide the GIC with verification that this criterion has been fulfilled e.g. collateral interviews, official documentation from employers, educational institutions or other formal organisations. The period of living in the gender role that is congruent with the individual's gender identity before genital reassignment surgery can be extended if the GIC and/or patient feel that further time is needed or if attendance at the GIC is inconsistent.

On completion of the period of living in the gender role that is congruent with the individual's gender identity before genital reassignment surgery, the patient and GIC will review and agree their treatment plan and revisit the discussion on treatments, procedures, access criteria, associated risks and expectations (refer to appendix 2 for information for treatment plan discussion).

Patients who elect not to have surgery can continue on hormone therapy. This may be supervised by specialist endocrinologists or gynaecologists, if this supervision is available. The appropriate clinician (usually the patient's GP) should be asked to assume responsibility for continued prescribing of hormone therapy (with support as required from the GIC). GICs should ensure that GPs are aware of the hormone management guidelines as detailed in the protocol. In cases where the patient wishes to continue hormone

[3] Adapted from The World Professional Association for Transgender Health (WPATH) Standards of Care for the Health of Transsexual, Transgender, and Gender Nonconforming People, 7th version, September 2011 (page 61), http://www.wpath.org/

therapy and there is uncertainty about the stability of their gender role, the GIC should consider offering regular review appointments.

Appendix 2 – Treatment information to help inform Treatment Plan discussions

After a period of assessment, typically two to four consultations shared between two clinicians, one of which must be medically qualified, a provisional diagnosis should be agreed. If there is no diagnosis of gender dysphoria or atypical gender development, the GIC and patient should discuss appropriate options for future care. The GIC will write to the referring clinician and/or the patient's GP, informing of appropriate options for the future care of their patient and ask them to make any necessary referral. If a diagnosis of gender dysphoria or atypical gender development is made, the patient will continue with care in the GIC.

Once a diagnosis of gender dysphoria or atypical gender development is made, an Individual Care Plan (ICP) should be agreed between the GIC and the patient, after which the patient may access some treatments (to include psychotherapy, speech therapy and facial hair reduction) specified in the ICP through the GIC (or network). The responsible GIC clinician should discuss their patient's ICP with the GIC Multi-Disciplinary Team (MDT); once approved, other treatments specified in the ICP may be accessed through the GIC (or network). The treatments listed in the table below are those which are commissioned by NHS England and available through NHS England-commissioned GICs. The list is not intended to be prescriptive in terms of every patient having to access every treatment for their intended gender. Treatment should be flexible in response to individual needs and circumstances.

Treatments governed by the Gender Reassignment Protocol and Guideline	
Ongoing psychotherapy and counselling	Regular psychotherapy and counselling should be available throughout the patient's individualised gender dysphoria care pathway. This should be provided by therapists and counsellors with specialist knowledge of gender issues. Where such psychotherapy and counselling is not available within the GIC, GIC clinicians should signpost patients to external providers and support networks if required. The GIC should also provide information for patients' families, partners and carers. If necessary, GIC clinicians should signpost patients' families, partners and carers to external providers and support networks.
Hormone Therapy	NHS England expects GPs to co-operate with their commissioned GICs and to prescribe hormone therapy recommended for their patients by the GIC. They are also expected to co-operate with GICs in patient safety monitoring, by providing basic physical examinations (within the competence of GPs) and blood tests recommended by the GIC. The GIC is expected to assist GPs by providing relevant information and support, including the interpretation of blood test results. Hormone therapy should be monitored at least 6 monthly in the first 3 years and yearly thereafter, dependant on clinical need.
Facial hair removal	This is an essential treatment for MtF patients. Removal of facial hair relates directly to confidence and safety whilst undertaking the RLE. Electrolysis, laser and Intense Pulse Light (IPL) treatment may be used. See appendix 4.
Speech therapy	Speech and language therapy enables patients to work towards a voice which is more appropriate for their chosen gender. The GIC may request the patient's GP to refer them to a local provider. On the rare

	occasions that speech therapy proves to be unsuccessful, then voice modifying surgery may be considered through the NHS England IFR process.
Hair removal donor site	Successful hair removal from the donor site used for genital reconstructive surgery is key to avoiding further post-surgery complications. Laser depilation or electrolysis prior to surgery is recommended for this. See appendix 4.
Surgical treatments	
Male to Female (MtF)	Not all patients will undergo genital reassignment surgery. Patients will be referred for surgeries as agreed in their treatment plan. Procedures offered may include some or all of the following: • Penectomy (Removal of the penis) • Bilateral orchidectomy (Removal of the testes) • Vaginoplasty (Creation of the vagina) • Clitoroplasty & Labiaplasty (Creation of clitoris and labia)
Female to Male (FtM)	Not all patients will undergo genital reassignment surgery. All patients with a uterus receiving long-term testosterone therapy will be offered hysterectomy and bilateral salpingo-oophorectomy. Patients will be referred for surgeries as agreed in their treatment plan. • Bi-lateral mastectomy (removal of breasts) and chest reconstruction FtM patients may require this life-changing surgery early in their pathway so as not to perpetuate respiratory and other problems caused by wearing binders, and also to “pass” effectively in male gender (appendix 3) • Hysterectomy (Removal of uterus) • Vaginectomy (Removal of vagina) • Salpingo-oophorectomy (Removal of ovaries and Fallopian tubes) • Metoidoplasty (Creation of micropenis) • Phalloplasty (Creation of penis from using skin and muscle tissue from another site, e.g. abdomen, forearm or thigh) • Urethoplasty (Creation/join-up of urethra) • Scrotoplasty (Creation of scrotum) • Placement of an appropriate penile prosthesis (inflatable or malleable) • Placement of testicular prostheses • Subsequent specialist surgery to restore urinary or sexual function, if clinically indicated

Some patients may require more extensive core treatment procedures than those described in the Protocol and guideline. Additional core procedures will only be considered by the four NHS England Area Team Individual Funding Request (IFR) panels on an exceptional basis.

Additional core procedures are:

- Additional or revision surgery to breasts, chest or genitals
- Voice modifying surgery

Referrals made under the IFR process should be clear and contain all relevant clinical information so that the NHS England Area Team IFR panel is able to make a proper assessment of the justification for performing such procedures.

The NHS England Area Team IFR panel must base its decisions on clearly defined and published criteria: to ensure equitable access to these treatments for patients throughout England, NHS England Area Team IFR panels must also ensure that their decision making process is consistent with other Area Team IFR panel practice throughout England.

Procedures not exclusive to gender reassignment ("non-core" procedures)
Some patients may require other medical procedures as part of the process of transforming their body to be more congruent with their gender. Other procedures that are not considered within the Gender Reassignment Protocol can only be considered by the patient's Clinical Commissioning Group (CCG). Examples of such procedures are given in the table below.

"Non-core" surgical procedures are not routinely commissioned by the NHS and can only be provided on an exceptional clinical need basis. Patients will only be referred for this surgery following a clinical assessment by their GIC and where a symptomatic or functional requirement for surgery has been identified. All cases will be referred to the patient's GP's CCG for consideration and assessment against CCG Policy. Access criteria will consider age, body mass index (BMI), impairment of function, and psychological distress. Referral for consideration does not necessarily mean that surgery will be offered. **This must be communicated to the patient.**

Treatments that may be sought through the CCG Policy	
Breast augmentation (augmentation mammoplasty)	This should only be considered where there is a clear failure of breast growth in response to adequate hormone treatment. Review of breast development in anticipation of breast augmentation surgery should be made no earlier than after the completion of 18 months of adequate hormone treatment. It should be made clear to patients during individual treatment plan discussions that assessments of the appropriateness of breast augmentation will be made no earlier than after the completion of 18 months of adequate hormone treatment.
Facial Feminisation Surgery (FFS)	Treatments may include: • Thyroid chondroplasty / Tracheal shave (reducing size of larynx) • Rhinoplasty (nasal surgery) • Facial bone reduction • Blepharoplasty / Facelift
Lipoplasty / Contouring	Liposuction and / or body sculpture

Gamete storage	Using similar protocols as with those receiving radiotherapy and other gamete damaging procedures

Where the provision of “non-core” surgeries is appropriate, the GIC should apply for treatment funding through the CCG; the GIC should endeavour to work in partnership with the CCG.

Appendix 3 – Treatment criteria

Within this section you will find information on criteria for the recommendation for and prescription of hormone therapy, and for surgical procedures. Further more detailed information and evidence-based clinical guidance can also be found in the UK Intercollegiate *Good Practice Guidelines for the Assessment & Treatment of Adults with Gender Dysphoria* and *The World Professional Association for Transgender Health (WPATH) Standards of Care for the Health of Transsexual, Transgender and Gender Nonconforming People, 7th Version* (September 2011), http://www.wpath.org

Recommendation for prescription of feminising/masculinising hormone therapy

NHS England expects GPs to co-operate with their commissioned GICs and to prescribe hormone therapy recommended for their patients by the GIC. They are also expected to co-operate with GICs in patient safety monitoring, by providing basic physical examinations (within the competence of GPs) and blood tests recommended by the GIC. The GIC is expected to assist GPs by providing relevant information and support, including the interpretation of blood test results. The recommendation from a GIC to prescribe hormone therapy must be made by a medically-qualified person. The recommending doctor shares ethical and legal responsibility for the decision to prescribe with the physician who writes the prescription for hormone therapy.

The recommended content of the letter of recommendation to the patient's GP for feminising/masculinising hormone therapy is as follows[4]:

1. The client's general identifying characteristics;
2. Results of the client's psychosocial assessment, including any diagnoses;
3. The duration of the referring health professional's relationship with the client, including the type of evaluation and therapy or counselling to date;
4. An explanation that the criteria for hormone therapy have been met, and a brief description of the clinical rationale for supporting the client's request for hormone therapy;
5. A statement about the fact that informed consent has been obtained from the patient;
6. A statement that the referring health professional is available for coordination of care and welcomes a phone call to establish this.

Hormone Therapy

Criteria for the prescription of hormone therapy

The GIC must first ensure patients meet the following eligibility and readiness criteria as adapted from the World Professional Association for Transgender Health (WPATH)

[4] Ibid (page 26)

Standards of Care[5] before taking the decision to refer to the appropriate clinician for prescription of hormones.

The criteria for hormone therapy are as follows:

1. Persistent, well-documented gender dysphoria;
2. Capacity to make a fully informed decision and to consent for treatment;
3. Aged at least 17 years (see Appendix 5 for protocol details for children and adolescents aged under 18);
4. If significant medical or mental health concerns are present, they must be reasonably well controlled.

The presence of co-existing mental health concerns does not necessarily preclude access to feminising/masculinising hormones; rather, these concerns need to be managed prior to or concurrent with treatment of gender dysphoria.

A recommendation for hormone therapy may form part of the patient's Individual Care Plan (ICP), and must be agreed between the GIC and the patient. The decision to recommend hormone therapy should have the documented support of two clinicians who are directly involved in patient's care; at least one must be medically qualified, who must make the prescribing recommendation.

In most circumstances, the patient will have completed their GIC assessment prior to the GIC physician making a recommendation for hormone therapy. Typically, this will be around six months, but no less than 3 months, after the patient's first consultation. However, the GIC physician, the patient's GP or another medical practitioner involved in the patient's care may prescribe "bridging" endocrine treatments as part of a holding and harm reduction strategy while the patient awaits specialised endocrinology or other gender identity treatment and/or confirmation of hormone prescription elsewhere or from patient records.

There is no requirement for the patient to have commenced a social role transition before a recommendation is made for hormone therapy.

Full discussion of fertility issues, including the possibility of gamete storage, should precede endocrine treatment.

It is unethical to deny availability or eligibility for hormone therapy solely on the basis of blood seropositivity for blood-borne infections such as HIV or hepatitis B or C.

In rare cases, hormone therapy may be contraindicated due to serious individual health conditions.

Health professionals should assist these patients with accessing non-hormonal interventions for gender dysphoria.

[5] The World Professional Association for Transgender Health (WPATH) Standards of Care for the Health of Transsexual, Transgender and Gender Nonconforming People, 7th Version, September 2011 (P 34-50), http://www.wpath.org

Hormone therapy can provide significant comfort to gender patients who do not wish to transition to a different gender role or undergo surgery, or who are unable to do so. Hormone therapy may be recommended for patients who do not want surgery following assessment following assessment by GIC clinicians and in accordance with the standards described above. In some patients, hormone therapy alone may provide sufficient symptomatic relief to obviate the need for transition to a different gender role or surgery.

Risks
It should be noted that there is limited data on the long term health risks of hormone treatment and patients should be made aware of the risks and the importance of long term monitoring. Some risks are identified in the following hormone management guides.

Continuous use of testosterone therapy in trans-men with an intact uterus increases their risk of developing endometrial hyperplasia and malignancy. Trans-men should be informed of this before commencing testosterone therapy and be strongly recommended to have a hysterectomy and bilateral salpingo-oophorectomy after receiving continuous testosterone therapy for 2-5 years.

Further information on the medical risks of hormone therapy can also be found in the UK Intercollegiate *Good Practice Guidelines* and WPATH Standards of Care, 7th Version (page 97) and on an official NHS Website.

Guidance on appropriate hormone management for patients undergoing gender transition and/or long-term trans-gender living may be found in the UK Intercollegiate *Good Practice Guidelines*.

Surgical treatment

Criteria for surgical procedures
To undergo such major irreversible procedures patients must be sufficiently physically fit and meet the criteria listed below as adapted from the WPATH Standard of Care, 7th version.

Bilateral mastectomy and FtM chest reconstruction
For transsexual men, this procedure is usually the first surgery performed and for some patients it is the only surgery undertaken. A recommendation for bilateral mastectomy and chest reconstruction may form part of the patient's Individual Care Plan (ICP), and must be agreed between the GIC and the patient. The decision to recommend this surgery should have the documented support of two clinicians who are directly involved in patient's care; at least one must be medically qualified, who must make the referral to the surgeon. The responsible GIC clinician should discuss this surgery as a component of their patient's ICP with the GIC MDT before making a referral for surgery. This is an irreversible procedure and timescales for when the surgery should take place should be agreed by the GIC in discussion with the patient.

Before referral for bilateral mastectomy and chest reconstruction, the patient will have completed their GIC assessment and may have engaged in a social role transition; in most circumstances, they will also have commenced treatment with masculinising hormones.

The decision to refer for surgery, and the timing of that decision, will be based upon an assessment of individual clinical need, and be agreed between the patient and clinician.Typically, a referral for this surgery will be around 9-12 months, but no less than 6 months, after the patient's first consultation. A decision to refer for surgery will be based upon individual patient need

Criteria for mastectomy and creation of a male chest in FtM patients[6]:

1. Persistent, well-documented gender dysphoria;
2. Capacity to make a fully informed decision and to consent for treatment;
3. Aged at least 17 (see Appendix 5 for protocol details for children and adolescents aged under 18)
4. If significant medical or mental health concerns are present, they must be reasonably well controlled.

The letter of referral for bilateral mastectomy and chest reconstruction surgery to a surgeon should contain the following information; a copy of the letter should be sent to the patient and their GP.

1. The client's general identifying characteristics;
2. Results of the client's psychosocial assessment, including any diagnoses;
3. The duration of the referring health professional's relationship with the client, including the type of evaluation and therapy or counselling to date;
4. An explanation that the criteria for bilateral mastectomy and chest reconstruction surgery have been met, and a brief description of the clinical rationale for supporting the client's request for surgery;
5. A statement that the referring health professional is available for coordination of care and welcomes a phone call to establish this.

Hysterectomy and bilateral salpingo-oophorectomy

Trans-men who undergo genital reassignment surgery will normally have hysterectomy and bilateral salpingo-oophorectomy as a component of that procedure.

Hysterectomy and/or salpingo-oophorectomy solely for the purpose of treatment of gender dysphoria requires two opinions, usually from members of the gender clinic team or network (one letter may have 2 signatories). The second opinion may also be from a General Practitioner with Specialised Interest (GPwSI) or the patient's GP. Patients should have a written copy of the decision and referral letter(s).

Criteria for hysterectomy and bilateral salpingo-oophorectomy in FtM patients :

1. Persistent, well-documented gender dysphoria;
2. Capacity to make a fully informed decision and to consent for treatment;
3. Aged at least 17 (see Appendix 5 for protocol details for children and adolescents aged under 18)

[6] Adapted from the World Professional Association for Transgender Health (WPATH) Standards of Care for the Health of Transsexual, Transgender and Gender Nonconforming People, 7th Version, September 2011, (page 59), http://www.wpath.org

4. If significant medical or mental health concerns are present, they must be reasonably well-controlled
5. 12 months continuous endocrine treatment as appropriate to the patient's goals (unless the patient has medical contraindications or is otherwise unable to take hormones).

These criteria do not apply to medical conditions requiring advice, opinion or treatment from a gynaecologist or oncologist, where direct referral by a physician is appropriate. Continuous use of testosterone therapy in trans-men with an intact uterus increases their risk of developing endometrial hyperplasia and malignancy. For trans-men who retain an intact uterus, this procedure must be strongly recommended for all those who have received continuous testosterone therapy for 2-5 years. Either hysterectomy and/or salpingo-oophorectomy, or alternative monitoring arrangements, must be agreed between the GIC and the patient.

The letter of referral for hysterectomy and bilateral salpingo-oophorectomy to a surgeon should contain the following information; a copy of the letter should be sent to the patient and their GP.

1. The client's general identifying characteristics;
2. Results of the client's psychosocial assessment, including any diagnoses;
3. The duration of the referring health professional's relationship with the client, including the type of evaluation and therapy or counselling to date;
4. An explanation that the criteria for hysterectomy and bilateral salpingo-oophorectomy have been met, and a brief description of the clinical rationale for supporting the client's request for surgery;
5. A statement that the referring health professional is available for coordination of care and welcomes a phone call to establish this.

Genital reassignment surgery

Patients should only be referred for genital surgery once they have completed the period of living in the gender role that is congruent with the individual's gender identity before genital reassignment surgery agreed in their treatment plan with their GIC. The decision to offer this surgery will involve two opinions, one of which is from a member of the gender identity team or network that has clinical experience with the patient; the second opinion should come from a gender specialist who is not directly involved in the patient's care; at least one of the opinions should be given by a medically-qualified person. The case must have been discussed within the multidisciplinary team or network that has clinical experience with the patient. (UK19.9)

Criteria for genital surgery in FtM patients and MtF patients[7]:

1. Persistent, well documented gender dysphoria;
2. Capacity to make a fully informed decision and to consent for treatment;
3. Aged at least 17 (see Appendix 5 for protocol details for children and adolescents aged under 18);

[7] Adapted from Ibid (page 60),

4. If significant medical or mental health concerns are present, they must be well controlled;
5. 12 continuous months of hormone therapy as appropriate to the patient's gender goals (unless the patient has a medical contraindication or is otherwise unable or unwilling to take hormones);
6. A period of living in the gender role that is congruent with the individual's gender identity (sometimes called "real-life experience") *before* the provision of genital reassignment surgery is required by authoritative guidelines; the duration of this period is agreed between the GIC and patient, and is typically 12 to 24 months.

The letter of referral for genital reassignment surgery to a surgeon should contain the following information; a copy of the letter should be sent to the patient and their GP.

1. The client's general identifying characteristics;
2. Results of the client's psychosocial assessment, including any diagnoses;
3. The duration of the referring health professional's relationship with the client, including the type of evaluation and therapy or counselling to date;
4. An explanation that the criteria for genital reassignment surgery have been met, and a brief description of the clinical rationale for supporting the client's request for surgery;
5. A statement that the referring health professional is available for coordination of care and welcomes a phone call to establish this.

A copy of the second opinion letter must be provided to the surgeon, along with the referral letter sent by the clinician giving the initial opinion and recommendation for genital reassignment surgery.

Breast augmentation and other surgeries that require approval through the CCG
Breast augmentation and other surgeries are not routinely offered as part of the gender reassignment protocol will only be considered for funding by the patient's GP's CCG. This should be communicated explicitly to all patients.

A recommendation for breast augmentation or other surgeries may form part of the patient's Individual Care Plan (ICP), and must be agreed between the GIC and the patient. The decision to recommend such surgeries should have the documented support of two clinicians who are directly involved in patient's care; at least one must be medically qualified, who must make the referral to the surgeon. The responsible GIC clinician should have discussed such surgeries as a component of their patient's ICP with the GIC MDT before making a referral for them, thereby ensuring at least two opinions have been sought during the care pathway. Surgery is an irreversible procedure and timescales for when surgery should take place should be agreed by the GIC in discussion with the patient.

Before referral for breast augmentation or other surgeries, the patient will have completed their GIC assessment and have engaged in the period of living in the gender role that is congruent with the individual's gender identity. Referral for breast augmentation surgery should only be considered where there is a clear failure of breast growth in response to adequate hormone treatment, unless there is an unequivocal medical contraindication to this. Review of breast development in anticipation of breast augmentation surgery should

be made no earlier than after the completion of 18 months of adequate hormone treatment. This should be made clear to patients during individual treatment planning.

Criteria for breast augmentation or other surgeries:

1. Persistent, well-documented gender dysphoria;
2. Capacity to make a fully informed decision and to consent for treatment;
3. Aged at least 17 (see Appendix 5 for protocol details for children and adolescents aged under 18)
4. If significant medical or mental health concerns are present, they must be reasonably well-controlled
5. For breast augmentation only, completion of 18 months continuous adequate feminising hormone treatment, unless there is an unequivocal medical contraindication to this.

The letter of referral for breast augmentation and other surgeries to a surgeon should contain the following information; a copy of the letter should be sent to the patient and their GP.

1. The client's general identifying characteristics;
2. Results of the client's psychosocial assessment, including any diagnoses;
3. The duration of the referring health professional's relationship with the client, including the type of evaluation and therapy or counselling to date;
4. An explanation that the criteria for breast augmentation and other surgeries, and a brief description of the clinical rationale for supporting the client's request for surgery;
5. A statement that the referring health professional is available for coordination of care and welcomes a phone call to establish this.

Treatment for complications related to surgery and revision surgery for unacceptable surgical outcomes

The surgeon will provide treatment for complications related to surgery and revision surgery for unacceptable surgical outcomes, as agreed between the patient and their surgeon, up to the time of discharge of the patient from their service. In the case of subsequent functional impairment experienced by a trans-man after phalloplasty (typically, failure of inflatable penile prosthesis or continence problems), he should be referred back to the surgical team which, if clinically necessary, will provide surgery or recommend referral to appropriate local facilities following review of the patient. With this exception, patients who are satisfied with surgical outcome at the time of discharge and become dissatisfied at a later date are not automatically entitled to further surgical treatment; such treatment is not routinely offered as part of the gender reassignment protocol will only be considered for funding by the patient's GP's CCG. This should be communicated explicitly to all patients.

Appendix 4 – Hair Reduction

Facial hair reduction

The reduction of facial hair is seen as an essential part of gender reassignment for a trans-woman to facilitate the period of living in the gender role that is congruent with the individual's gender identity before genital reassignment surgery. The absence of facial hair is of psychological benefit and will produce a greater well-being for the patient as there should be little or no need to remove hair on a constant basis.

It is recommended that facial hair removal should commence prior to social gender role transition, as the beard must grow to visible lengths to be removed.

Laser and Intense Pulse Light (IPL) treatment for facial hair reduction is most effective on those with dark hair and fair skin and is unsuitable for treating non-pigmented hairs such as grey, white, blonde and red; the latter may require reduction by electrolysis. Some modern lasers are able to effectively treat racially pigmented skin[8].

A fixed number of sessions (one site test and eight sessions), will be funded for facial hair reduction for trans-women.

Hair removal from donor site

If hair is not adequately removed from areas directly involved in reconstructive genital surgery prior to surgery, it can become a post-operative complication causing risk to the patient and necessitating further surgery to rectify the complication.

FtM patients require hair removal prior to radial artery phalloplasty or radial artery urethroplasty; otherwise the patient would have hair-bearing skin on the inside of the neourethra. MtF patients require hair removal prior to vaginoplasty and labiaplasty.

Hair removal from the donor site can be performed with a surgeon's recommendation prior to completion of the period of living in the gender role that is congruent with the individual's gender identity before genital reassignment surgery, in order to reduce delays in surgery.

[17] Good Practice Guidelines for the Assessment & Treatment of Gender Dysphoria (Draft), RCPsych Intercollegiate SoC Committee, 2006.

Appendix 5 – Services for Children and Young People in England under 18

Children and young people experiencing gender dysphoria will access treatment and support via the gender reassignment protocol. Each patient will be considered on an individual basis by their gender identity clinic.

At present specialist gender identity development services for children and young people under 18 are available through the Gender Identity Development Service at The Tavistock and Portman NHS Foundation Trust, London, and their satellite clinics in Exeter and Leeds. Children and young people should contact their GP in the first instance and thereafter may be referred to the Gender Identity Development Service at The Tavistock and Portman NHS Foundation Trust, London.

Other professionals in Health, Social Services and Education departments as well as young people and their families can contact the Service directly to discuss a possible referral[9]. Further information can be found at http://www.tavistockandportman.nhs.uk/genderidentityissues.

Teenagers who are 17 years of age or older may be seen in Adult Gender Clinic. They are entitled to consent to their own treatment and follow the standard adult protocol, and this consent cannot be overruled by their parents.

Additional contact details:

Gender Identity Development Service
The Tavistock and Portman NHS Foundation Trust
Tavistock Centre
120 Belsize Lane
London
NW3 5BA
Tel: 020 8938 2030
Fax: 020 7431 8320
Web: www.tavi-port.org

The Gender Identity Development Service at The Tavistock and Portman NHS Foundation Trust is part of the NHS Camden Child and Adolescent Mental Health Service (CAMHS) which offers help to children and adolescents from birth until their 19th birthday, their families and carers as well as offering advice and consultation to other professionals working with children, adolescents and their families.
Further information on assessment and treatment of children and young people under 16 with gender dysphoria can also be found in the WPATH Standards of Care, 7th version (page 10, http://www.wpath.org).

[9] The Tavistock and Portman NHS Foundation Trust Gender Identity Development Service Booklet, 2009, http://www.tavistockandportman.nhs.uk/sites/default/files/Gender%20Identity%20Development%20Service%20leaflet%202009.pdf

Appendix 6 – Supporting information for GPs

There are 7 gender specialist clinics for adults in NHS England and referrals can be made to these clinics to explore with the patient the options available to them.

Exeter (The Laurels) Lead Clinician: Dr John Dean	Devon Partnership NHS Trust The Laurels Gender and Sexual Medicine Clinic 11-15 Dix's Field Exeter EX1 1QA
Leeds (Newsome Centre) Lead Clinician: Dr Amal Beaini	Leeds and York Partnership NHS Foundation Trust Leeds Gender Identity Service Outpatient's Suite, 1st Floor, Newsome Centre, Seacroft Hospital, York Road, Leeds LS14 6UH
London (Charing Cross) Lead Clinician: Dr James Barrett	West London Mental Health Trust Gender Identity Clinic 179 – 183 Fulham Palace Road London W6 8QZ
Northampton Lead Clinician: Dr Byran Timmins	Northamptonshire Healthcare NHS Foundation Trust Denetre Hospital London Road, Daventry , Northants NN11 4DY
Nottingham Lead Clinician: Dr Walter Bouman	Nottinghamshire Healthcare trust Nottingham Gender Clinic Mandala Centre Gregory Boulevard Nottingham NG7 6LB
Sheffield Lead Clinician: Prof. Kevan Wylie	Sheffield Health and Social Care NHS Foundation Trust Porterbrook Clinic 75 Osbourne Road Nether Edge Hospital Sheffield S11 9BF
Newcastle Lead Clinician: Dr Helen Greener	Northumberland, Tyne & Wear NHS Foundation Trust Northern Region Gender Dysphoria Service Benfield House Walkergate Park Hospital Newcastle Upon Tyne NE6 4QD

Further guidance, good practice resources & support organisations:

- NHS Inform website: Gender Dysphoria Introduction – http://www.nhsinform.co.uk/health-library/articles/g/gender-dysphoria/introduction.aspx

Appendix 7 - Addendum

Clarification of two opinions - hormone therapy.

When considering the introduction of hormone therapy and referrals for surgeries other than genital reassignment surgery, the interim protocol refers to that decision, in the case of hysterectomy “solely for the purpose of treatment of gender dysphoria require[ing] two opinions” and, in the case of other surgeries, has “the documented support of two clinicians who are directly involved in patient's care”. The two opinions or expressions of support may arise from a discussion and agreement, made during the course of the patient’s routine care, between two clinicians directly involved in their care (typically a medically qualified physician and a counsellor or psychotherapist) that the intervention is in the patient’s best interests and is consistent with guidance set out in the UK Good Practice Guidelines; this discussion and agreement should be adequately documented in the patient’s clinical records. A recommendation for hormone therapy or a referral for surgery must be made by a medically qualified physician.

Appendix 8 – Implementation Plan

Implementation

- Individuals already being seen by services are on an existing pathway.

- The date for implementation of the protocol is 1 August 2013 for all new patients seen by services from that date.

- The protocol will be shared with area teams, who will work with services with regard to the impact of the protocol and how soon the protocol can be applied for existing patients.

- The aim would be that the protocol would be applicable for all patients by 1 October 2013, in line with other specialised service specifications, but it is appreciated until the protocol was agreed the detailed work had not been undertaken so the implications have not been quantified.

- By 12 September 2013 area teams will confirm to the Assistant Head of Specialised Services, Operational Delivery Directorate, the impact of the protocol for services as a result of implementation for all patients by 1 November 2013.

Appendix 9 – UK Intercollegiate Good Practice Guidelines for the Assessment & Treatment of Adults with Gender Dysphoria

This document should be used in conjunction with the UK Intercollegiate *Good Practice Guidelines for the Assessment & Treatment of Adults with Gender Dysphoria* and is cross-referenced to its relevant sections. It should be interpreted and implemented in a manner that is consistent with the UK Intercollegiate *Good Practice Guidelines*. This document is not intended to be exhaustive in content; issues not covered in this document should managed in accordance with the UK Intercollegiate *Good Practice Guidelines*.

The UK Intercollegiate Good Practice Guidelines for the Assessment and Treatment of Adults with Gender Dysphoria was released on 25 October 2013.

It is available on the following link -
http://www.rcpsych.ac.uk/usefulresources/publications/collegereports/collegereports.aspx

The Endocrine Society's
CLINICAL GUIDELINES

Endocrine Treatment of Transsexual Persons:

An Endocrine Society Clinical Practice Guideline

THE JOURNAL OF
CLINICAL
ENDOCRINOLOGY
& METABOLISM

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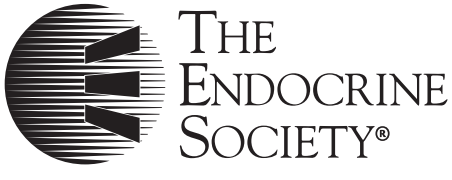

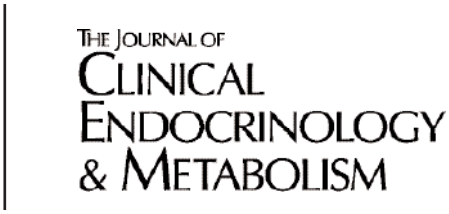

The Endocrine Society's
CLINICAL GUIDELINES

Endocrine Treatment of Transsexual Persons:

An Endocrine Society Clinical Practice Guideline

THE ENDOCRINE SOCIETY®

THE JOURNAL OF CLINICAL ENDOCRINOLOGY & METABOLISM

Table of Contents

Abstract

Objective: The aim was to formulate practice guidelines for endocrine treatment of transsexual persons.

Participants: An Endocrine Society-appointed Task Force of experts, a methodologist, and a medical writer.

Evidence: This evidence-based guideline was developed using the Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) system to describe the strength of recommendations and the quality of evidence, which was low or very low.

Consensus Process: Committees and members of The Endocrine Society, European Society of Endocrinology, European Society for Paediatric Endocrinology, Lawson Wilkins Pediatric Endocrine Society, and World Professional Association for Transgender Health commented on preliminary drafts of these guidelines.

Conclusions: Transsexual persons seeking to develop the physical characteristics of the desired gender require a safe, effective hormone regimen that will 1) suppress endogenous hormone secretion determined by the person's genetic/biologic sex and 2) maintain sex hormone levels within the normal range for the person's desired gender. A mental health professional (MHP) must recommend endocrine treatment and participate in ongoing care throughout the endocrine transition and decision for surgical sex reassignment. The endocrinologist must confirm the diagnostic criteria the MHP used to make these recommendations. Because a diagnosis of transsexualism in a prepubertal child cannot be made with certainty, we do not recommend endocrine treatment of prepubertal children. We recommend treating transsexual adolescents (Tanner stage 2) by suppressing puberty with GnRH analogues until age 16 years old, after which cross-sex hormones may be given. We suggest suppressing endogenous sex hormones, maintaining physiologic levels of gender-appropriate sex hormones and monitoring for known risks in adult transsexual persons.

(J Clin Endocrinol Metab 94: 3132–3154, 2009)

Abbreviations: BMD, Bone mineral density; FTM, female-to-male; GID, gender identity disorder; MHP, mental health professional; MTF, male-to-female; RLE, real-life experience.

Clinical Policy Bulletin: Gender Reassignment Surgery

Number: 0615

Policy History

- Last Review: 10/15/2013
Effective: 05/14/2002
Next Review: 07/24/2014
- Review History
- Definitions

Additional Information

- Clinical Policy Bulletin Notes

Policy

Note: Most Aetna plans exclude coverage of sex change surgery (gender reassignment surgery, transgender surgery). Please check benefit plan descriptions.

Aetna considers sex reassignment surgery medically necessary when all of the following criteria are met:

I. Requirements for mastectomy for female-to-male patients:

A. Single letter of referral from a qualified mental health professional (see Appendix); *and*
B. Persistent, well-documented gender dysphoria (see Appendix); *and*
C. Capacity to make a fully informed decision and to consent for treatment; *and*
D. Age of majority (18 years of age or older); *and*
E. If significant medical or mental health concerns are present, they must be reasonably well controlled.

Note that a trial of hormone therapy is not a pre-requisite to qualifying for a mastectomy.

II. Requirements for gonadectomy (hysterectomy and oophorectomy in female-to-male and orchiectomy in male-to-female):

A. Two referral letters from qualified mental health professionals, one in a purely evaluative role (see appendix); *and*
B. Persistent, well-documented gender dysphoria (see Appendix); *and*
C. Capacity to make a fully informed decision and to consent for treatment; *and*
D. Age of majority (18 years or older); *and*
E. If significant medical or mental health concerns are present, they must be reasonably well controlled; *and*
F. Twelve months of continuous hormone therapy as appropriate to the member's gender goals (unless the member has a medical contraindication or is otherwise unable or unwilling to take hormones)

III. Requirements for genital reconstructive surgery (i.e., vaginectomy, urethroplasty, metoidioplasty, phalloplasty, scrotoplasty, and placement of a testicular prosthesis and erectile prosthesis in female to male; penectomy, vaginoplasty, labiaplasty, and clitoroplasty in male to female)

   A. Two referral letters from qualified mental health professionals, one in a purely evaluative role (see appendix); and
   B. Persistent, well-documented gender dysphoria (see Appendix); and
   C. Capacity to make a fully informed decision and to consent for treatment; and
   D. Age of majority (age 18 years and older); and
   E. If significant medical or mental health concerns are present, they must be reasonably well controlled; and
   F. Twelve months of continuous hormone therapy as appropriate to the member's gender goals (unless the member has a medical contraindication or is otherwise unable or unwilling to take hormones); and
   G. Twelve months of living in a gender role that is congruent with their gender identity (real life experience).

Note: Rhinoplasty, face-lifting, lip enhancement, facial bone reduction, blepharoplasty, breast augmentation, liposuction of the waist (body contouring), reduction thyroid chondroplasty, hair removal, voice modification surgery (laryngoplasty or shortening of the vocal cords), and skin resurfacing, which have been used in feminization, are considered cosmetic. Similarly, chin implants, nose implants, and lip reduction, which have been used to assist masculinization, are considered cosmetic.

Note on gender specific services for transgender persons:

Gender-specific services may be medically necessary for transgender persons appropriate to their anatomy. Examples include:

1. Breast cancer screening may be medically necessary for female to male transgender persons who have not undergone a mastectomy;
2. Prostate cancer screening may be medically necessary for male to female transgender individuals who have retained their prostate.

Aetna considers gonadotropin-releasing hormone medically necessary to suppress puberty in transgender adolescents if they meet World Professional Association for Transgender Health (WPATH) criteria (see CPB 501 - Gonadotropin-Releasing Hormone Analogs and Antagonists).

Aetna considers the following procedures that may be performed as a component of a gender reassignment as cosmetic (not an all-inclusive list) (see also CPB 031 - Cosmetic Surgery):

- Abdominoplasty
- Blepharoplasty
- Brow lift
- Calf implants
- Cheek/malar implants
- Chin/nose implants
- Collagen injections
- Drugs for hair loss or growth
- Forehead lift
- Hair removal

- Hair transplantation
- Lip reduction
- Liposuction
- Mastopexy
- Neck tightening
- Pectoral implants
- Removal of redundant skin
- Rhinoplasty
- Voice therapy/voice lessons.

Background

Transsexualism is "a gender identity disorder in which the person manifests, with constant and persistent conviction, the desire to live as a member of the opposite sex and progressively take steps to live in the opposite sex role full-time." People who wish to change their sex may be referred to as "Transsexuals" or as people suffering from "Gender Dysphoria" (meaning unhappiness with one's gender).

Transsexuals usually present to the medical profession with a diagnosis of transsexualism, a sophisticated understanding of their condition, and a desired course of treatment, that is, hormone therapy and sex-reassignment surgery. The therapeutic approach to gender identity disorder consists of experience of living in an identity-congruent gender role, hormones of the desired gender, and surgery to change the genitalia and other sex characteristics (Day, 2002). The most typical order is hormones followed by life experience in an identity-congruent gender role and, finally, surgery.

For male to female transsexuals selected for surgery, procedures may include genital reconstruction (vaginoplasty, penectomy, orchidectomy, clitoroplasty), breast augmentation and cosmetic surgery (facial reshaping, rhinoplasty, abdominoplasty, laryngeal shaving, vocal cord shortening, hair transplants) (Day, 2002). For female to male transsexuals, surgical procedures may include genital reconstruction (phalloplasty, genitoplasty, hysterectomy, bilateral oophorectomy), mastectomy, chest wall contouring and cosmetic surgery (Day, 2002).

The criterion noted above for some types of genital surgeries – i.e., that patients engage in 12 continuous months of living in a gender role that is congruent with their gender identity – is based on expert clinical consensus that this experience provides ample opportunity for patients to experience and socially adjust in their desired gender role, before undergoing irreversible surgery (Coleman, et al., 2011).

In addition to hormone therapy and sex-reassignment surgery, psychological adjustments are necessary in changing sex. Treatment should focus on psychological adjustment, with hormone therapy and sex-reassignment surgery being viewed as confirmatory procedures dependent on adequate psychological adjustment. Psychiatric care may need to be continued after sex-reassignment surgery. The overall success of treatment depends partly on the technical success of the surgery, but more crucially on the psychological adjustment of the transsexual, and the support from family, friends, employers and the medical profession.

Nakatsuka (2012) noted that the 3rd versions of the guideline for treatment of people with gender identity disorder (GID; also known as transgenderism) of the Japanese Society of Psychiatry and Neurology does not include puberty-delaying hormone therapy. It is recommended that feminizing/masculinizing hormone therapy and genital surgery should

not be carried out until 18 year old and 20 year old, respectively. On the other hand, the 6th (2001) and the 7th (2011) versions of the standards of care for the health of transsexual, transgender, and gender non-conforming people of World Professional Association for Transgender Health (WPATH) recommend that transsexual adolescents (Tanner stage 2, [mainly 12 to 13 years of age]) are treated by the endocrinologists to suppress puberty with gonadotropin-releasing hormone (GnRH) agonists until age 16 years old, after which cross-sex hormones may be given. A questionnaire on 181 people with GID diagnosed in the Okayama University Hospital (Japan) showed that female to male (FTM) transsexuals hoped to begin masculinizing hormone therapy at age of 15.6 +/- 4.0 (mean +/- S.D.) whereas male to female (MTF) transsexuals hoped to begin feminizing hormone therapy as early as age 12.5 +/- 4.0, before presenting secondary sex characters. After confirmation of strong and persistent cross-gender identification, adolescents with GID should be treated with cross-gender hormone or puberty-delaying hormone to prevent developing undesired sex characters. These treatments may prevent transsexual adolescents from attempting suicide, suffering from depression, and refusing to attend school. Subsequent early breast and genital surgery may help being employed in desired sexuality.

Spack (2013) stated that GID is poorly understood from both mechanistic and clinical standpoints. Awareness of the condition appears to be increasing, probably because of greater societal acceptance and available hormonal treatment. Therapeutic options include hormone and surgical treatments but may be limited by insurance coverage because costs are high. For patients seeking MTF change, hormone treatment includes estrogens, finasteride, spironolactone, and GnRH analogs. Surgical options include feminizing genital and facial surgery, breast augmentation, and various fat transplantations. For patients seeking a FTM gender change, medical therapy includes testosterone and GnRH analogs and surgical therapy includes mammoplasty and phalloplasty. Medical therapy for both FTM and MTF can be started in early puberty, although long-term effects are not known. All patients considering treatment need counseling and medical monitoring.

Appendix

Table 1: DSM 5 Criteria for Gender Dysphoria in Adults and Adolecents:.

A. A marked incongruence between one's experienced/expressed gender and assigned gender, of at least 6 months duration, as manifested by 2 or more of the following indicators:

I. A marked incongruence between one's experienced/expressed gender and primary and/or secondary sex characteristics (or, in young adolescents, the anticipated secondary sex characteristics)
II. A strong desire to be rid of one's primary and/or secondary sex characteristics because of a marked incongruence with one's experienced/expressed gender (or, in young adolescents, a desire to prevent the development of the anticipated secondary sex characteristics)
III. A strong desire for the primary and/or secondary sex characteristics of the other gender
IV. A strong desire to be of the other gender (or some alternative gender different from one's assigned gender)
V. A strong desire to be treated as the other gender (or some alternative gender different from one's assigned gender)
VI. A strong conviction that one has the typical feelings and reactions of the other gender (or some alternative gender different from one's assigned gender)

B. The condition is associated with clinically significant distress or impairment in social, occupational, or other important areas of functioning, or with a significantly increased risk of suffering, such as distress or disability

Table 2: Format for referral letters from Qualified Health Professional: (From SOC-7)

I. Client's general identifying characteristics; and
II. Results of the client's psychosocial assessment, including any diagnoses; and
III. The duration of the mental health professional's relationship with the client, including the type of evaluation and therapy or counseling to date; and
IV. An explanation that the WPATH criteria for surgery have been met, and a brief description of the clinical rationale for supporting the patient's request for surgery; and
V. A statement about the fact that informed consent has been obtained from the patient; and
VI. A statement that the mental health professional is available for coordination of care and welcomes a phone call to establish this.

Note: There is no minimum duration of relationship required with mental health professional. It is the professional's judgment as to the appropriate length of time before a referral letter can appropriately be written. A common period of time is three months, but there is significant variation in both directions. When two letters are required, the second referral is intended to be an evaluative consultation, not a representation of an ongoing long-term therapeutic relationship, and can be written by a medical practitioner of sufficient experience with gender dysphoria.

Note: Evaluation of candidacy for sex reassignment surgery by a mental health professional is covered under the member's medical benefit, unless the services of a mental health professional are necessary to evaluate and treat a mental health problem, in which case the mental health professional's services are covered under the member's behavioral health benefit. Please check benefit plan descriptions.

Table 3: Characteristics of a Qualified Mental Health Professional: (From SOC-7):

I. Master's degree or equivalent in a clinical behavioral science field granted by an institution accredited by the appropriate national accrediting board. The professional should also have documented credentials from the relevant licensing board or equivalent; and
II. Competence in using the Diagnostic Statistical Manual of Mental Disorders and/or the International Classification of Disease for diagnostic purposes; and
III. Ability to recognize and diagnose co-existing mental health concerns and to distinguish these from gender dysphoria;
IV. Knowledgeable about gender nonconforming identities and expressions, and the assessment and treatment of gender dysphoria; and
V. Continuing education in the assessment and treatment of gender dysphoria. This may include attending relevant professional meetings, workshops, or seminars; obtaining supervision from a mental health professional with relevant experience; or participating in research related to gender nonconformity and gender dysphoria.

CPT Codes / HCPCS Codes / ICD-9 Codes

CPT codes covered if selection criteria are met:

19301, 19303 - 19304

53430

54125

54400 - 54417

54520

54660

54690

55175

55180

55970

55980

56625

56800

56805

56810

57106 - 57107, 57110 - 57111

57291 - 57292

57335

58150, 58180, 58260 - 58262, 58275 - 58291, 58541 - 58544, 58550 - 58554

58570 - 58573

58661

58720

CPT codes not covered for indications listed in the CPB [considered cosmetic]:

11950 - 11954

15775

15776

15780 - 15787

15788 - 15793

15820 - 15823

15824 - 15828

15830 - 15839

15876 - 15879

17380

19316

19318

19324 - 19325

19340

19342

19350

21120 - 21123

21125 - 21127

21208

21210

21270

30400 - 30420

30430 - 30450

67900

92507

92508

Other CPT codes related to the CPB:

11980

90785

90832 - 90838

96372

HCPCS codes covered if selection criteria are met:

J1950	Injection, leuprolide acetate (for depot suspension), per 3.75 mg
J9217	Leuprolide acetate (for depot suspension), 7.5 mg

J9218	Leuprolide acetate, per 1 mg
J9219	Leuprolide acetate implant, 65 mg

HCPCS codes not covered for indications listed in the CPB :

G0153	Services performed by a qualified speech-language pathologist in the home health or hospice setting, each 15 minutes
S9128	Speech therapy, in the home, per diem

ICD-9 codes covered if selection criteria are met:

302.50 - 302.53	Trans-sexualism
302.85	Gender identity disorder in adolescents or adults

ICD-9 codes not covered for indications listed in the CPB:

293.0 - 302.4, 302.6 - 302.84, 302.89 - 319	Mental disorders [other than transexualism and gender identity disorder]
752.7	Indeterminate sex and pseudohermaphroditism
758.0 - 758.9	Chromosomal anomalies

The above policy is based on the following references:

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EVALUATION OF EVIDENCE: APPLIED BEHAVIOR ANALYSIS FOR AUTISM SPECTRUM DISORDERS

What are we trying to do? Oregon Senate Bill 365 was passed in 2013. This bill directs the Health Evidence Review Commission (HERC) to evaluate the evidence related to applied behavior analysis (ABA) for the treatment of autism spectrum disorder (ASD) in children that receive services as determined by the Prioritized List of Health Services under the Oregon Health Plan (OHP).

The history of coverage of treatment for ASD by OHP

1) This issue was last examined in 2008 by the Oregon Health Resources Commission. Currently, applied behavior analysis is not covered by OHP. Individuals may receive up to eight hours of treatment per month for the behaviors associated with ASD.
2) ASD often exists with other conditions, and these conditions have their own considerations for treatment, most of which are covered. Short-term rehabilitation and certain medicines are also covered.

What has been done so far?

1) HERC met August 8, 2013, discussed the process for completion of this evaluation of evidence, and referred the issue to the Evidence-based Guidelines Subcommittee (EbGS) for further discussion. On September 12, 2013, the EbGS reviewed the initial draft evaluation of evidence, heard public testimony and requested additional research by staff.
2) EbGS continued discussions at the November 7, 2013 meeting where it approved a draft evaluation of the evidence and preliminary conclusions that were released for public comment.
3) During a 30-day written public comment period that ended on December 16, 2013, 28 individuals submitted comments along with 356 citations for consideration.
4) Three ad hoc experts have been appointed to assist the subcommittee with its review of the evidence.
    a. Eric Fombonne, MD (Professor, OHSU Dept. of Psychiatry)
    b. Eric Larsson, PhD, LP, BCBA-D (Lovaas Institute for Early Intervention, Midwest Headquarters)
    c. Katharine Elizabeth Zuckerman, MD, MPH, FAAP (Assistant Professor, OHSU Division of General Pediatrics and Child and Adolescent Health Measurement Initiative)

5) The EbGS had planned to review public comments and continue discussions at its February 7 meeting, but the meeting was cancelled due to a snowstorm. A replacement meeting was held March 20, 2014. The subcommittee reviewed public comment, continued its discussion and provided staff with general direction for drafting recommendations.
6) On April 24, 2014 the EbGS met once again and finalized its recommendations.

What are the draft recommendations?

1) During its review to date, EbGS has determined that moderate-quality evidence indicates benefit for ABA in children with ASD between the ages of 1-12. The subcommittee also adopted criteria for continued coverage based on documented progress towards treatment goals and established intensity and duration limits.
2) EbGS also decided to offer more limited coverage for focused ABA in individuals with autism who are over the age of 12. This coverage would be limited to dealing with specific problematic behaviors.

What happens now?

1) The EbGS evaluation and conclusions will go to the Value-based Benefits Subcommittee (VbBS) on May 8, 2014. VbBS will use the EbGS conclusions to determine what changes may be needed to the Prioritized List of Health Services and if there are any issues that would be involved in implementing these changes in OHP.
2) The evidence evaluation and any changes to the Prioritized List will eventually need final approval by the full HERC, which has members from many areas of health care (doctors, nurses, chiropractic, patients, health plan administrators, and more).
3) Any changes to the Prioritized List affecting OHP coverage of ABA would go into effect sometime between October 1, 2014 and April 1, 2015.

How can you participate?

1) You can subscribe to the HERC website at www.oregon.gov/OHA/OHPR/Pages/HERC/ to receive notifications of future meetings and look at materials being discussed.
2) You can attend the meetings, which are open to the public, and provide verbal testimony during time set aside for public comment.

Applied Behavioral Analysis ABA for Autism spectrum disorders

Question: How should applied behavior analysis for autism spectrum disorder be incorporated into the Prioritized List?

Question source: EbGS, HERC staff

Issue:

See ABA Overview and Update for details.

Senate Bill 365 (see attached for complete bill)
Oregon Senate Bill 365 was passed by the Oregon legislature in the 2013 regular session. That bill establishes requirements for state-regulated commercial health plans to approve and manage autism treatment, including ABA therapy and any other medical or mental health services identified in an individualized treatment plan. The law applies to patients who seek care before age nine, covering up to 25 hours of ABA per week, and continuing as long as medically necessary. Health plans that provide coverage to OEBB and PEBB are required to begin coverage in 2015, and all other health plans are required to begin coverage in 2016. The bill required HERC to evaluate the evidence for ABA and make a coverage decision for OHP.

Applied behavior analysis is defined in the bill as the following:

> The design, implementation and evaluation of environmental modifications, using behavioral stimuli and consequences, to produce significant improvement in human social behavior, including the use of direct observation, measurement and functional analysis of the relationship between environment and behavior and that is provided by:
>
> > (i) A licensed health care professional registered under section 3 of this 2013 Act;
> >
> > (ii) A behavior analyst or an assistant behavior analyst licensed under section 3 of this 2013 Act; or
> >
> > (iii) A behavior analysis interventionist registered under section 3 of this 2013 Act.
>
> "Applied behavior analysis" excludes psychological testing, neuropsychology, psychotherapy, cognitive therapy, sex therapy, psychoanalysis, hypnotherapy and long-term counseling as treatment modalities.

EbGS has reviewed the evidence and adopted summary conclusions based on the evidence and a modified GRADE methodology. Expert input was solicited and reviewed. Public comment was solicited and reviewed. In addition to specific comments, a total of 336 unduplicated citations were provided by public commenters. Each citation was evaluated to determine study design or article type and population

characteristics (number and ages of included individuals), the abstract was retrieved and a link to the article provided when available.

Given that the focus of most of the public comment pertained to requesting that ABA be recommended for coverage in individuals over age 12, detailed review of citations was limited to those studies. A random sample of 10% of SSRD study types (60 total) were reviewed in additional detail. In addition, all systematic reviews and meta-analyses of SSRDs were reviewed in more detail.

EbGS deliberations

EbGS met April 24, 2014, having reviewed the evidence, public written comment, in person public comment, expert input and approved a modified Evidence Review Document to send to VbBS.

Current Prioritized List information:
Line: 313
Condition: AUTISM SPECTRUM DISORDERS (See Guideline Notes 64,65,75)
Treatment: CONSULTATION/MEDICATION MANAGEMENT/LIMITED BEHAVIORAL MODIFICATION
ICD-9: 299.00-299.91
CPT: 90785,90832-90840,90846-90849,90882,90887,96101,96118,98966-98969,99051,99060,99201-99215,99224-99226, 99366,99441-99444,99487-99496
HCPCS: G0176,G0177,G0406-G0408,G0425-G0427, H0023, H0032, H0034, H0038, H2010, H2011, H2014,H2027,H2032, S0270,S0272-S0274,S9484,T1016

Current guideline
GUIDELINE NOTE 75, AUTISM SPECTRUM DISORDERS
Line 334
There is limited evidence of the effectiveness of treatment (e.g., Applied Behavioral Analysis) for Autism Spectrum Disorders (ASD). However, effective treatments may be available for co-morbid conditions such as mood disorders. When treating co-morbid conditions, that condition, not an ASD diagnosis, should be the primary diagnosis for billing purposes. The treatment of co-morbid mental health conditions should be consistent with the treatment methods, frequency, and duration normally applied to those diagnoses. Treatment of neurologic dysfunctions that may be seen in individuals with an ASD diagnosis are prioritized according to the four dysfunction lines found on the Prioritized List (Lines 78, 318, 375 and 407). Treatment for associated behaviors, such as agitation, that do not meet the criteria for co-morbid mental health diagnoses should be limited in frequency to a maximum of 8 hours of behavioral health service per month, subject to utilization management review by the mental health organization (MHO) or other relevant payer.

New CPT codes for ABA therapy

1) New category III CPT codes have been published by the AMA effective July 1, 2014
    a. 0359T-0363T (adaptive behavior assessments)
    b. 0364T-374T (adaptive behavior treatments)
    c. See attached document submitted by Dr. Larsson for information on definition of these codes

Of note, DMAP has a rule that excludes the use of temporary codes. This rule would need to be deleted. As a result, there is a good likelihood of a number of temporary codes being brought to VBBS/HERC for review.

EbGS approved GRADE table

Indication/Intervention	Balance between desirable and undesirable effects	Quality of evidence*	Resource allocation	Values and preferences	Recommendation
Children aged 1 to 12 years at initiation					
Early Intensive Behavioral Interventions	Benefit on cognitive and language skills	Moderate	High	Low variability	Recommendation for coverage (strong recommendation)
	Benefit on adaptive behavior, social skills and overall autism severity	Low	High	Low variability	
Parent training interventions	Increased joint attention and parent synchrony, and improved early language and communication	Moderate	Moderate	Low variability	Recommendation for coverage (strong recommendation)

Indication/Intervention	Balance between desirable and undesirable effects	Quality of evidence*	Resource allocation	Values and preferences	Recommendation
	skills				
	Lessened overall severity of autism and improved early cognition	Low	Moderate	Low variability	
Play/interaction-based interventions (including joint attention interventions)	Improvements in joint attention and language skills	Moderate	Low	Low variability	Recommendation for coverage (strong recommendation)
	Short-term improvements in play, imitation, social skills	Low	Low	Low variability	
Adolescents and young adults					
ABA	Unknown	Insufficient	Moderate for focused, high for more comprehensive	Low variability	Recommend noncoverage of intensive ABA therapies *(weak recommendation)* Recommendation for coverage for specific problem behaviors with focused interventions *(weak recommendation)*

EBGS APPROVED SUMMARY CONCLUSIONS

Children ages 1 to 12

Applied behavior analysis (ABA), including early intensive behavioral intervention (EIBI), is recommended for coverage[1] for treatment of autism spectrum disorder[2] (*strong recommendation*).

> Rationale: This strength of recommendation was based on sufficient (moderate quality) evidence and expert input, including testimony on parent/caregiver values and preferences.

Specifically, EIBI (for example, UCLA/Lovaas or ESDM), is recommended for coverage for up to 25 hours per week for a maximum of three years.

> Rationale: The 25-hour limit would be similar to other payers in Oregon that were mandated through SB 365 and earlier Warren report had demonstrated 25 hours per week was effective. There is no evidence that increased intensity beyond this level yields improves outcomes. The duration limit is based on the fact that EIBI studies have a duration of 2-3 years

Initial coverage of EIBI should be provided for up to six months. Ongoing coverage should be based on demonstrated progress towards meaningful predefined objectives (objectives should be achieved as a result of the EIBI, over and beyond gains that would be expected to arise from maturation alone) using standardized, multimodal assessments, no more frequently than every six months *(strong recommendation).* Examples of such assessments include Vineland, IQ tests (Mullen, WPPSI, WISC-R), language measures, behavioral checklists (CBCL, ABC), and autistic symptoms measures (SRS).

> Rationale: Ensuring that patients are making meaningful progress is important to ensure quality outcomes and effective use of resources. The six month assessment was chosen based on expert input and subcommittee deliberation to allow for sufficient time for progress while not being burdensome to providers and plans.

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[1] These conclusions apply to the Oregon Health Plan as governed by the Prioritized List of Health Services and to no other health plan.

[2] Autism spectrum disorder should be diagnosed by a qualified health care professional according to DSM-5 criteria.

Less intensive ABA-based interventions

If EIBI is not indicated, has been completed, or there is not sufficient progress toward multidimensional goals, then less intensive behavioral ABA-based interventions (such as parent training, play/interaction based interventions, and joint attention interventions) are recommended for coverage to address core symptoms of autism and/or specific problem areas *(strong recommendation)* for up to 8 hours per month. In extenuating circumstances (e.g severe aggressive behavior that is responding to interventions but requires increased intensity), an additional 8 hours per month is recommended for coverage. Initial coverage should be provided for six months. Ongoing coverage should be based on demonstrated progress towards meaningful predefined objectives or emergence of new problem behaviors.

> Rationale: Not all autistic children require comprehensive therapy and less intensive interventions will be appropriate for many, or appropriate for those who have completed intensive intervention. Evidence supports these less intensive interventions in this age group. Eight hours was chosen based on a wide range of intensity in the literature, expert input, and previous HERC Prioritized List guideline precedent.

Parent/caregiver involvement and training is recommended to be a component of treatment *(strong recommendation).*

> Rationale: Evidence and expert input indicated that parental involvement in ABA is a key part of effective treatment. Parent delivered therapy is effective.

<u>Individuals ages 13 and older</u>

Intensive ABA is not recommended for coverage for treatment of autism spectrum disorder in persons ages 13 and older (*weak recommendation*).

> Rationale: There is insufficient evidence to support intensive ABA treatment at older ages.

For individuals age 13 and older, targeted behavioral interventions, including focused ABA*, are recommended for coverage for up to 8 hours per month, up to 6 months, only to address specific problem behaviors (*weak recommendation*).

Behaviors eligible for coverage include those which place the member at risk for harm or create significant daily issues related to care, education, or other important functions. The interventions should involve predefined behavioral objectives that would result in socially important and sustainable outcomes for the individual. Ongoing coverage should be based on demonstrated progress towards meaningful predefined objectives with ongoing proof of medical appropriateness, or emergence of new problem behaviors.

Rationale: According to the trusted evidence source, there is insufficient evidence to support ABA-based interventions in this age group. Public comment and some expert testimony involved submission of many single subject research design studies to support treatment in this age group, but the quality of this evidence did not meet predetermined criteria for inclusion. The subcommittee agreed that problem behaviors can be challenging to the individual, caregivers, and society and it is reasonable to consider targeted interventions for specific problem behaviors as long as there are clear objectives, progress toward meaningful predefined goals and ongoing proof of medical appropriateness. The net result was to recommend targeted interventions including ABA-based treatments for limited intensity to address problem behaviors. Six months was chosen based on expert testimony and subcommittee discussion that more frequent assessments would potentially be burdensome to providers and plans.

Parent/caregiver involvement and training is encouraged *(weak recommendation)*

Note: The evidence for the treatment of conditions comorbid with autism spectrum disorder is beyond the scope of this evidence summary.

HERC staff recommendations:

1) Plan to delete current guideline note 75
2) Add a replacement guideline note

GUIDELINE NOTE 75 APPLIED BEHAVIOR ANALYSIS FOR AUTISM SPECTRUM DISORDER

Line 313

Applied behavioral analysis (ABA), including early intensive behavioral intervention (EIBI) (CPT 0359T-0363T), is included on line 313 for the treatment of autism spectrum disorders.

Intensive interventions

Specifically, EIBI (for example, UCLA/Lovaas or ESDM), is covered for up to 25 hours per week for a maximum of three years.

Initial coverage of EIBI is provided for up to six months. Ongoing coverage is based on demonstrated progress towards meaningful predefined objectives (objectives should be achieved as a result of the EIBI, over and beyond gains that would be expected to arise from maturation alone) using a standardized, multimodal assessment, no more frequently than every six months.. Examples of such assessments include Vineland, IQ tests (Mullen, WPPSI, WISC-R), language measures, behavioral checklists (CBCL, ABC), and autistic symptoms measures (SRS).

Less intensive ABA-based interventions

If EIBI is not indicated, has been completed, or there is not sufficient progress toward multidimensional goals, then less intensive behavioral ABA-based interventions (such as parent training, play/interaction based interventions, and joint attention interventions) are covered to address core symptoms of autism and/or specific problem areas for up to 8 hours per month.

In extenuating circumstances (e.g severe aggressive behavior that is responding to interventions but requires increased intensity), an additional 8 hours per month is covered.

Initial coverage is provided for six months. Ongoing coverage is based on demonstrated progress towards meaningful predefined objectives, with proof of medical appropriateness and/or emergence of new problem behaviors.

Parent/caregiver involvement

Parent/caregiver involvement and training is recommended to be a component of treatment.

Individuals ages 13 and older

Intensive ABA is not covered. Targeted ABA-based behavioral interventions, are covered for up to 8 hours per month, for up to 6 months, only to address specific problem behaviors. Behaviors eligible for coverage include those which place the member at risk for harm or create significant daily issues related to care, education, or other important functions. Ongoing coverage is based on demonstrated progress towards meaningful predefined objectives, with proof of medical appropriateness and/or emergence of new problem behaviors.

Parent/caregiver involvement and training is encouraged.

3) Add CPT 0359T-0363T (adaptive behavior assessments) to line 313 AUTISM SPECTRUM DISORDERS
    a. Discuss if any further clarification about assessments versus interventions and types of providers should be addressed in the Prioritized List guideline
    b. See Dr. Larsson's submitted alternatives
4) Consider adding clarifying language about how speech/pt/ot services for other qualifying conditions are covered when ABA is also being covered
    a. ABA services are provided in addition to any rehabilitative services (e.g. physical therapy, occupational therapy, speech therapy) included in guideline note 6, REHABILITATIVE THERAPIES that are indicated for other qualifying conditions
5) Determine whether staff should look into adding a guideline about self-injury and other problem behaviors in non-autistic children

HEALTH EVIDENCE REVIEW COMMISSION (HERC)

EVALUATION OF EVIDENCE: APPLIED BEHAVIOR ANALYSIS FOR AUTISM SPECTRUM DISORDERS

DRAFT for VbBS Meeting Materials 5/8/2014

BACKGROUND

Oregon Senate Bill 365 was passed by the Oregon legislature in the 2013 regular session. That bill directs the Health Evidence Review Commission to evaluate applied behavioral analysis (ABA) as a treatment for autism spectrum disorder (ASD) for the purposes of updating the prioritized list of health services. The bill also establishes requirements for state-regulated health plans to approve and manage autism treatment, including ABA therapy and any other medical or mental health services identified in an individualized treatment plan. The law applies to patients who seek care before age nine, covering up to 25 hours of ABA per week, and continuing as long as medically necessary. Health plans that provide coverage to OEBB and PEBB are required to begin coverage in 2015, and all other health plans are required to begin coverage in 2016. Applied behavior analysis is defined in the bill as the following:

The design, implementation and evaluation of environmental modifications, using behavioral stimuli and consequences, to produce significant improvement in human social behavior, including the use of direct observation, measurement and functional analysis of the relationship between environment and behavior and that is provided by:

> (i) A licensed health care professional registered under section 3 of this 2013 Act;
>
> (ii) A behavior analyst or an assistant behavior analyst licensed under section 3 of this 2013 Act; or
>
> (iii) A behavior analysis interventionist registered under section 3 of this 2013 Act.

“Applied behavior analysis” excludes psychological testing, neuropsychology, psychotherapy, cognitive therapy, sex therapy, psychoanalysis, hypnotherapy and long-term counseling as treatment modalities.

For details of the public process used to develop this evaluation of evidence, see http://www.oregon.gov/oha/herc/Pages/blog-ABA.aspx

EVIDENCE SOURCES

Warren, Z., Veenstra-VanderWeele, J., Stone, W., Bruzek, J.L., Nahmias, A.S., Foss-Feig, J.H., et al. (2011). *Therapies for children with autism spectrum disorders. Comparative effectiveness review no. 26.* (Prepared by the Vanderbilt Evidence-based Practice Center under Contract No. 290-2007-10065-I). AHRQ Publication No. 11-EHC029-EF. Rockville, MD: Agency for Healthcare Research and Quality. April 2011. Retrieved from http://effectivehealthcare.ahrq.gov/index.cfm/search-for-guides-reviews-and-reports/?pageaction=displayproduct&productid=651

Update of Warren 2011 in draft form:

Therapies for children with autism spectrum disorder – Behavioral interventions update. Draft Comparative Effectiveness Review. Rockville, MD: Agency for Healthcare Research and Quality. Retrieved January 27, 2014, from http://effectivehealthcare.ahrq.gov/search-for-guides-reviews-and-reports/?pageaction=displayProduct&productID=1845

Lounds Taylor, J., Dove, D., Veenstra-VanderWeele, J., Sathe, N.A., McPheeters, M.L., Jerome, R.N., et al. (2012). *Interventions for adolescents and young adults with Autism Spectrum Disorders. Comparative Effectiveness Review No. 65.* (Prepared by the Vanderbilt Evidence-based Practice Center under Contract No. 290-2007-10065-I.) AHRQ Publication No. 12-EHC063-EF. Rockville, MD: Agency for Healthcare Research and Quality. Retrieved from http://effectivehealthcare.ahrq.gov/index.cfm/search-for-guides-reviews-and-reports/?productid=1197&pageaction=displayproduct

Maglione, M., Motala, A., Shanman, R., Newberry, S., Schneider Chafen, J., & Shekelle, P. (2012). *AHRQ Comparative Effectiveness Review Surveillance Program: Therapies for Children with Autism Spectrum Disorders, 2nd Assessment.* Rockville, MD: Agency for Healthcare Research and Quality. Retrieved from http://effectivehealthcare.ahrq.gov/search-for-guides-reviews-and-reports/?pageaction=displayproduct&productID=1536

Oono, I.P., Honey, E.J., & McConachie, H. (2013). Parent-mediated early intervention for young children with autism spectrum disorders (ASD). *Cochrane Database of Systematic Reviews*, Issue 4. Retrieved from http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD009774.pub2/abstract

- *List of included studies in Oono 2013 provided in Appendix D*

Glossary Sources

Agency for Healthcare Research and Quality (AHRQ) Effective Health Care Program. (n.d.). Glossary of terms. Retrieved from http://effectivehealthcare.ahrq.gov/index.cfm/glossary-of-terms/

National Cancer Institute (NCI) at the National Institutes of Health (NIH). (n.d.). NCI dictionary of cancer terms. Retrieved from http://www.cancer.gov/dictionary

The summary of evidence in this document is derived directly from these evidence sources, and portions are extracted verbatim.

SUMMARY OF EVIDENCE

Clinical Background

The following clinical background summary is extracted from the update to the Warren 2011 report (AHRQ draft, 2014).

> Autism spectrum disorder (ASD) is a neurodevelopmental disorder marked by impaired social communication and social interaction accompanied by atypical patterns of behavior and interest. ASD is differentiated from other developmental disorders by significant impairments in social interaction and communication, along with restrictive, repetitive, and stereotypical behaviors and activities. Social communication and social interaction features include deficits in social-emotional reciprocity (e.g., deficits in joint attention, atypical social approach and response, conversational challenges, reduced sharing of interest, emotions, and affect), deficits in nonverbal communication (e.g., atypical eye contact, reduced gesture use, limited use of facial expressions in social interactions, challenges understanding nonverbal communication), and deficits in forming and maintaining relationships (e.g., diminished peer interest, challenges joining in play, difficulties adjusting behavior to social context). ASD features of restricted, repetitive patterns of behavior, interests, or activities may include stereotyped motor mannerisms, use of objects, or speech (e.g., simple motor stereotypies, repetitive play, echolalia, and formal or idiosyncratic speech); insistence on sameness, inflexible adherence to routines, or ritualized patterns of behavior (e.g., distress at small changes, rigid patterns of thought and behavior, performance of everyday activities in ritualistic manner); intense preoccupation with specific interests (e.g., strong attachment to objects, circumscribed or perseverative topics of interest); and sensory sensitivities or interests (e.g., hyper- or hypo-reactivity to pain and sensory input, sensitivity to noise, visual fascination with objects or movement). These symptoms cause impairment across many areas of functioning and are present early in life. However, impairments may not be fully evident until environmental demands exceed children's capacity. They also may

be masked by learned compensatory strategies later in life. Many children with ASD may also have intellectual impairment or language impairment, and the disorder may be associated with known medical, genetic, or environmental factors. (p. ES-1)

The prevalence of ASD in the United States is 11.3 cases per 1,000 (or 1 in 88) children living in the communities surveyed, with rate estimates varying widely by region of the country, sex, and race/ethnicity. Considerably more males (1 in 54) than females (1 in 252) are affected. For some individuals, the core symptoms of ASD (impairments in communication and social interaction and restricted/repetitive behaviors and interests) may improve with intervention and maturation; however, core deficits typically translate into varying developmental presentations that remain throughout the lifespan. Longitudinal studies indicate that adults with ASD struggle to obtain adaptive independence. (p. 1)

Treatments for ASD include behavioral, educational, medical, allied health, and complementary approaches. Individual goals for treatment vary for different children and may include combinations of therapies. For many individuals, core symptoms of ASD (impairments in communication and social interaction and restricted/repetitive behaviors and interests) may improve with intervention and over time5-8; however, deficits typically remain throughout the lifespan. Chronic management—often using multiple treatment approaches—may be required to maximize ultimate functional independence and quality of life. (p. ES-1)

This review of the evidence addresses only behavioral interventions for ASDs that utilize principles of applied behavior analysis (ABA).

ABA is an umbrella term describing principles and techniques used in the assessment, treatment and prevention of challenging behaviors and the promotion of new desired behaviors. The goal of ABA is to teach new skills, promote generalization of these skills, and reduce challenging behaviors with systematic reinforcement. The principles and techniques of ABA existed for decades prior to specific application and study within ASDs. (AHRQ draft, 2014, p. 5)

Interventions that utilize the principles of ABA include comprehensive treatments referred to as Early Intensive Behavioral and Developmental Interventions (EIBI). Two of these intensive treatments have been manualized (i.e., have published treatment manuals to facilitate replication): the UCLA/Lovaas model and the Early Start Denver Model (ESDM). There are other treatment approaches that also incorporate ABA principles, and may be intensive in nature, but have not been manualized. A third particular set of interventions include those using the principles of ABA to focus on key

pivotal behaviors rather than global improvements. These approaches emphasize parent training as a modality for treatment delivery (e.g., Pivotal Response Training, Hanen More than Words, social pragmatic intervention, etc.) and may focus on specific behaviors such as initiating or organizing activity or on core social communication skills.

Play-/interaction-based interventions may employ ABA principles and are included in this review. These interventions use interactions between children and adults (either parents or researchers) to improve outcomes such as imitation or joint attention skills or the ability of the child to engage in symbolic play. They include teaching parents how to interact differently with their children within daily routines and interactions, often using standard behavior management strategies.

Evidence Review

Children Ages Two to Twelve

EIBI and Other ABA Interventions

Warren (2011)

The Warren (2011) AHRQ review included all study designs as long as there were at least 10 participants. A total of 30 discrete studies were included, with the largest study population being 78 participants. The longest duration of treatment in any included study was three years. The mean age of children at intake in the included studies ranged from 21 to 66 months for EIBI interventions and from 42 months to 10.8 years for other ABA interventions. Authors reach the following conclusions:

> The evidence suggests that early intensive behavioral and developmental intervention (EIBI) may improve core areas of deficit for individuals with ASDs; however, randomized controlled trials (RCTs) are few and include small numbers of participants. In addition, there are no direct comparison trials. "Within this category, studies of UCLA/Lovaas-based interventions report greater improvements in cognitive performance, language skills, and adaptive behavior skills than broadly defined eclectic treatments available in the community. However, strength of evidence is currently low" (Warren, 2011, p. ES-7). In addition, the consistency of benefit is lacking, in that "not all children demonstrate rapid gains, and many children continue to display substantial impairment" (Warren, 2011, p. ES-7). Although positive results are reported for the effects of intensive interventions that use a developmental framework, such as ESDM, evidence for this type of intervention is currently insufficient because few studies have been published to date.

Less intensive interventions focusing on providing parent training for bolstering social communication skills and managing challenging behaviors have also been studied. Some interventions have shown short-term gains in social communication and language use, but the current evidence base for such treatment remains insufficient. Strength of evidence is also considered insufficient for play- and interaction-based approaches.

Only one study was identified that directly addressed whether there are any modifiers of outcomes for different ABA-based behavioral approaches. It examined the impact of which provider (parent vs. professional) delivered the UCLA/Lovaas protocol-based interventions. There was no significant difference in outcomes for children receiving the intervention in a clinical setting vs. at home from highly trained parents.

Other potential correlates that warrant further study because of conflicting data include pretreatment IQ and language skills, and age of initiation of treatment (with earlier age potentially associated with better outcomes). “Social responsiveness and imitation skills have been suggested as skills that may correlate with improved treatment response in UCLA/Lovaas treatment, whereas ‘aloof’ subtypes of ASDs may be associated with less robust changes in IQ. Other studies have seen specific improvement in children with PDD-NOS vs. Autistic Disorder diagnoses, which may be indicative of baseline symptom differences. However, many other studies have failed to find a relationship between autism symptoms and treatment response” (Warren, 2011, p. ES-8).

“Research on very young children is preliminary, with four studies identified. One good-quality RCT suggested benefit from the use of ESDM in young children, with improvements in adaptive behavior, language, and cognitive outcomes. Diagnostic shifts within the autism spectrum were reported in close to 30 percent of children but were not associated with clinically significant improvements in Autism Diagnostic Observation Schedule severity scores or other measures” (Warren, 2011, p. ES-9).

There was no evidence identified in the Warren review that addressed treatment effectiveness in specific subgroups such as race, ethnicity, gender or socioeconomic status, other than age. Details of all comparative studies that reported comparative statistics are provided in the table below.

Table 1. Comparative Studies included in Warren 2011

Author	Study Design	Intervention Intensity	Intervention Duration	Summary of Outcome
Smith 2000	RCT, intensive vs. parent training	Intensive: 30 hrs/wk with therapist, 5	intensive: 2-3 yrs	Intensive group had improved IQ, developmental

Author	Study Design	Intervention Intensity	Intervention Duration	Summary of Outcome
		hrs/wk with parents X 3 months Parent: taught techniques from Lovaas manual 2 sessions/wk	parent: 3-9 mos	scores compared to parent training, as well as in 1 communication score, but not in 3 others, and no sig diff in adaptive function MIXED
Drew 2002	RCT, parent training vs. local services (ST, OT, ABA, home worker)	Parent: 6.3 hrs/wk Local: 3.5 hrs/wk	Not specified; follow up at 1 year	No sig diff between groups in cognitive[1] outcomes. parent group had some better communication outcomes MIXED
Aldred 2004	RCT, social communication intervention vs. routine care (not described)	Intervention: monthly treatment sessions X 6 months (time not specified), then less frequent for another 6 months Control: routine care	1 year	Intervention group had better language scores, parent asynchrony. No diff in shared attention MIXED
Eikeseth 2002/ 2007	Non-randomized CT, Lovaas behavioral treatment vs. eclectic (TEACCH, sensory-motor therapies, ABA)	Lovaas: 28 hrs/wk Eclectic: 29 hrs/wk	Not specified; first follow up at 1 year	Lovaas group had sig more improvement than eclectic in IQ, communication, adaptive behavior at both 1 and 8 year follow up for most measures POSITIVE
Reed 2007	Non-randomized CT, high intensity ABA vs. low intensity ABA	High: mean 30 hrs/wk Low: mean 13 hrs/wk	Not specified	No diff in autism severity, adaptive behavior. Mixed result for cognitive, with high intensity scoring better on one measure but not another MIXED
Howard 2005	Prospective cohort, intensive ABA vs. intensive eclectic (delivered in school) vs. non-intensive public early intervention	ABA: 25-30 hrs/wk for age <3, 35-40 for age >3 plus parent training Intensive eclectic: not specified Public EI: not specified	Follow up at 14 mos	ABA group had sig higher scores than mean of the other two groups for all outcome measures except motor skills POSITIVE
Remington	Prospective cohort,	EI: mean 26 hrs/wk	2 years	EI group had sig higher

[1] Educational, cognitive, and academic outcomes are reported together and noted as "cognitive" unless specified otherwise.

Author	Study Design	Intervention Intensity	Intervention Duration	Summary of Outcome
2007	home-based early intervention (parent delivered with tutors) vs. local education standard treatment	Control: not specified		scores for most outcomes, including social skills, communication, adaptive behavior, cognitive function POSITIVE
Cohen 2006	Prospective cohort, EIBI (Lovaas) vs. services from public school (parent choice)	Intervention: 35-40 hrs/wk, 47 wks/yr Control: not specified	3 years	Intervention group had higher IQ, were more likely in regular classroom and had higher adaptive scores; no sig diff in communication POSITIVE
Stahmer 2001	Prospective cohort, parent information support group and education course on PRT vs. education course only (control)	2 hrs/week for intervention group vs 1 hr/wk for control	12 weeks	Sig more parents in the intervention group correctly used PRT techniques, and their children had improved communication POSITIVE
Zachor 2007 (appears to be a subset of Itzchak 2009)	Prospective cohort, behavioral vs. eclectic	Behavioral: 1 to 1 35 hrs/wk Eclectic: special ed teacher, various therapists (OT, ST), parent training, at least 16 hrs/wk	Not specified	Sig improved overall severity, communication behavioral group compared to eclectic, no sig diff in social skills POSITIVE
Hayward 2009/ Eikeseth 2009	Prospective cohort, clinic based vs. parent managed	Clinic: 37 hrs/week Parent: 34 hrs/week (mean supervision hrs/mo = 5)	1 year	No differences between groups in communication, adaptive behavior, cognitive/academic NEGATIVE
Eldevik 2006	Retrospective cohort, low intensity behavioral (Lovaas) vs. eclectic (alternative communication, TEACCH, sensory-motor, ABA	Behavioral: 12 hrs/wk Eclectic: not specified	Behavioral: 20 mos Eclectic: 21 mos	Behavior group had mixed outcomes on cognitive measures (better on some measures, no diff on others), better communication scores, fewer problem behaviors. no diff in adaptive scores MIXED
Reed 2007	Retrospective cohort, ABA vs. special nursery vs. portage (parent training)	ABA: mean 30 hrs/wk Special nursery: mean 12 hrs/wk Portage: mean 8 hrs/wk	Not specified	27 diff outcomes measures reported on, no sig diffs on 18. ABA group had better scores than one or the other of the comparators for the following measures: 2 of 3 overall ratings, 4 of 8 communication scores, 3 of

Author	Study Design	Intervention Intensity	Intervention Duration	Summary of Outcome
				7 behavior scores. There were no diffs in motor skills scores, cognitive scores, comorbidities MIXED

In summary, the intensity of experimental interventions ranged from less than two hours per week to 40 hours per week. For the control interventions, intensity was often not specified, but was as high as 34 hours per week. Of those studies showing a mostly positive outcome for the intervention, intensity ranged from 26 to 40 hours per week, with the exception of the Stahmer study, which was a very narrowly focused intervention aimed at teaching parents a specific skill.

With regard to duration, five studies did not specify the length of the intervention period. The shortest study was 12 weeks, while the longest was 3 years. Of those studies showing a mostly positive outcome for the intervention, duration ranged from no more than a year to three years, with the exception of the Stahmer study.

The following limitations of the evidence were noted by the report authors:

> A high proportion of studies in this review (36 percent) fail to use a comparison group, and while substantial strides have been made in the analysis of single-subject designs, these are not ideal for assessing effectiveness at a population level, nor are they appropriate for comparative effectiveness research. They are, however, used frequently in the behavioral literature, and so we address our decisions regarding them here. Because there is no separate comparison group in these studies they would be considered case reports (if only one child included) or case series (multiple children) under the rubric of the EPC study designs. Case reports and case series can have rigorous evaluation of pre- and post-measures, as well as strong characterization of the study participants.
>
> Studies using this design that included at least 10 children were included in the review. Studies of this type can be helpful in assessing response to treatment in very short time frames and under very tightly controlled circumstances, but they typically do not provide information on longer term or functional outcomes. They are useful in serving as demonstration projects, yielding initial evidence that an intervention merits further study, and, in the clinical environment, they can be useful in identifying whether a particular approach to treatment is likely to be helpful for a specific child. Our goal was to identify and review the best evidence for assessing the efficacy and effectiveness of therapies for children with ASD, with an eye toward their utility in the clinical setting, and for the larger population

of children with ASD. By definition, “populations” in single-subject design studies are likely to be idiosyncratic and therefore not to provide information that is generalizable.

Nonetheless, even in studies with a comparison group, sample size is frequently insufficient to draw conclusions, and larger, multisite trials are needed across all treatment types. Furthermore, the choice of comparison groups in the studies that employed a group design was uneven. A number of studies used comparison groups that were inappropriate for observing group differences in treatment effect (e.g., comparing treatment in children with autism to the effects of the treatment in typically developing peers or to children with a different developmental disorder), and for those studies we could only use the pre-post case series data available in the group with autism, limiting the ability to comment on effectiveness.

We encourage investigators to provide adequate detail as they describe their interventions to allow for replicable research. In ideal circumstances, investigators publish and reference treatment manuals, but many studies made general references to their use of an underlying approach (e.g., ABA) without specifying the ways in which they used the technique or modifications they made to the original, published use of it. Lack of detail about the intervention makes it difficult to assess the applicability of individual studies, to synthesize groups of studies or to replicate studies.

Characterization of the study population was often inadequate, with 125 of 159 studies failing to use or report “gold standard” diagnostic measures (clinical DSM-IV-based diagnosis plus ADI-R and/or ADOS) for the participants. Because ASDs are spectrum disorders, it is difficult to assess the applicability of interventions when the population in which they were studied is poorly defined or described. Authors often do not consider diagnostic criteria in selecting participants for their studies; nor do they fully describe the children who do participate. We recommend that investigators fully describe participants in their study, both diagnostically and otherwise. In addition, because the myriad causes of ASDs are unknown, even children with the same diagnosis may have distinct genetic or other “causes” that could affect treatment effectiveness. Ideally, future research will better characterize participants genotypically and phenotypically.

We identified more than 100 distinct outcome measures used in this literature base, not accounting for subscales. The use of so many and such disparate outcome measures makes it nearly impossible to synthesize the effectiveness of the interventions, and we recommend a consistent set of rigorously evaluated outcome measures specific to each intended target of treatment to move

comparative effectiveness research forward and to provide a sense of expected outcomes of the interventions. At the same time, the means for assessing outcomes should include increased focus on use of observers or reporters masked to the intervention status of the participant, and where some outcomes are measured in a masked fashion but others not, more emphasis should be placed on those that are.

There also was a strong tendency for authors to present data on numerous outcomes without adjusting for multiple comparisons, and to fail to report the outcome that was the primary outcome of *a priori* interest and on which sample size calculations were based (when they were present). This may suggest a level of selective reporting bias in which results are published on a select group of outcomes that show the most effect. We attempted, but were unable, to identify a clear primary intended outcome in almost all of the papers.

Duration of treatment and follow up was generally short, with few studies providing data on long-term outcomes after cessation of treatment. Future studies should extend the follow up period and assess the degree to which outcomes are durable. Few studies adequately accounted for concomitant interventions that might confound observed effectiveness and this should be standardized in future research. (Warren, 2011, p. 124-125)

[Evidence Source]

Maglione (2012)

Surveillance of the literature pertaining to the Warren report was conducted by AHRQ in January 2012 and October 2012 (Maglione, 2012). Conclusions pertaining to ABA therapies that address the currency of the 2011 report are presented below:

- Original conclusions regarding low strength of evidence for Early Intensive Behavioral Interventions (EIBI) are possibly out of date due to new RCTs and long-term follow-up of previously included studies.
- Original conclusion regarding insufficient evidence for parent training is possibly out of date due to several new RCTs.
- For Key Question 2 [what are the modifiers of outcome for different treatments or approaches (frequency, duration or intensity of treatment, characteristics of child or family, training of therapy provider)], conclusions are still valid, with the exception of impact of provider type, which may possibly be out of date. (p. ii)

[Evidence Source]

AHRQ Draft Report Update (2014)

Given this evidence of additional research, AHRQ elected to update the Warren report, focusing only on behavioral interventions. They published their draft report in January 2014. A summary of the findings is below:

> We included 51 unique studies comprising 37 randomized trials and 14 nonrandomized, comparative studies (16 good, 31 fair, and 4 poor quality) published since the prior review. The quality of studies improved compared with that reported in the earlier review. Young children receiving high intensity applied behavior analysis-based early intervention over extended time frames commonly displayed substantial improvement in cognitive functioning and language skills relative to community controls. The magnitude of these effects varied across studies, potentially reflecting poorly understood modifying characteristics related to subgroups of children. Early intensive parent training programs modified parenting behaviors during interactions; however, data were more limited about their ability to improve developmental skills beyond language gains for some children. Social skills interventions varied in scope and intensity and showed some positive effects on social behaviors for older children in small studies. Evidence for play/interaction-based approaches suggested that joint attention interventions may be useful for young and preschool children with ASD when targeting joint attention skills; data on the effects of such interventions in other areas were limited. (AHRQ draft, 2014, p. v)

Of the 51 included studies, 25 addressed interventions included in this report (EIBI except when delivered as an educational intervention, symbolic play and joint attention interventions, parent training). Three studies addressed EIBI, 12 studies addressed parent training, nine studies addressed play and/or interaction based approaches and one evaluated the addition of parent training to individuals using risperidone. Some characteristics of the included studies are reported in the table below:

Table 2 Summary of new studies from AHRQ draft report update

Intervention Type	Intensity Range	Duration Range	Age Range
EIBI (excluding educational interventions)	15 to 26 hours/week[2]	24 months	15 to 54 months
Parent training	30 minutes sessions X 10 to 30	12 weeks to 2 years	18 to 66 months

[2] The study with 15 hours included an additional 16 hours of parent delivered treatment

Intervention Type	Intensity Range	Duration Range	Age Range
	hours/week home based ABA[3]		
Play/Interaction Based Interventions[4]	20 minutes 2X/day, 5 days/week to 3 hours/week[5]	6 to 12 weeks	21 to 82 months
Parent Training in addition to Risperidone	11 sessions + boosters, 1 home visit	16 weeks	4 to 14 years

With regard to the impact of intensity or duration on treatment effectiveness, the authors report the following:

- In a retrospective cohort study of EIBI, treatment duration was not determined to be a significant predictor of outcome after controlling for other variables.
- In one parent training RCT evaluating ESDM (12 one hour sessions plus treatment as usual), total intervention hours (range zero to 16 hours/week, mean 1.5 hours/week for intervention group vs. 3.7 hours/ week for control) were associated with improved developmental and vocabulary scores, as was younger child age.

With regard to strength of the evidence, the authors reach the following conclusions:

> A growing evidence base suggests that children receiving early intensive behavioral and developmental interventions (e.g., many hours of intervention a week over the course of 1-2 years) show substantial improvements in cognitive and language skills over time compared with children receiving low-intensity interventions, community controls, and eclectic non-ABA based intervention approaches. With this growing literature, our confidence (strength of evidence) in the effects of ABA-based early intensive approaches on cognitive and language outcomes is moderate, based on the need for additional research that identifies which groups of children benefit the most from specific high intensity approaches.

[3] The study that included 30 hours/week of home based ABA compared this group to three other interventions: special ed classroom (mean 13 hours/week), low-intensity, home based manualized intervention (mean 8 hours/week) and 1:1 behavioral intervention that included a 5 day parent training component (mean 13 hours/week). This study found no significant differences in cognitive or adaptive scores between groups, but did find differences in educational outcomes favoring the intensive ABA group.
[4] Typically delivered in addition to other treatment as usual
[5] Four of the studies did not report treatment intensity

> Our strength of evidence in these high intensity interventions to affect adaptive behavior skills, social skills, and core ASD symptom severity is low. At present it is challenging to understand which high intensity variants most robustly impact these domains for specific children and in general the impact of these skill domains is less consistent.
>
> A growing evidence base suggests that children receiving early joint attention-related intervention in combination with other interventions show substantial improvements in joint attention and language skills over time. Within this growing literature, our confidence (strength of evidence) in this effect is moderate, based on the need for additional research that identifies which groups of children benefit the most from this approach and how this intervention relates to other ongoing concurrent offered interventions. Results from a variety of play-based interventions also suggest that young children often display short-term improvements in early play, imitation, language, and social interaction skills. However, our confidence in these estimates is low, and substantial evidence that these short-term improvements are linked to broader indices of change over time is lacking (AHRQ draft, p. 75).
>
> The evidence base for parent training interventions is moderate for their impact on early language and communication skills and low for impact on ASD symptom severity and early cognition. There is not yet sufficient data from this literature base to understand impact on adaptive behavior skills. Available studies indicate variable responses, with modest improvement for some children in some approaches, but limited improvement in other parent training paradigms. (AHRQ draft, 2014, p. 67)

Parent-mediated Early Intervention

Oono (2013)

A review of parent-mediated early intervention in children less than seven was completed by the Cochrane Collaboration in April 2013 (Oono, 2013). It included 17 RCTs (one of which was identified in the AHRQ surveillance report, and eight of which were included in the original Warren report) and drew the following conclusions:

> Overall, we did not find statistical evidence of gains from parent-mediated approaches in most of the primary outcomes assessed (most aspects of language and communication - whether directly assessed or reported; frequency of child initiations in observed parent-child interaction; child adaptive behaviour; parents' stress), with findings largely inconclusive and inconsistent across studies. However, the evidence for positive change in patterns of parent-child interaction was strong and statistically significant (shared attention: standardized mean difference (SMD) 0.41; 95% confidence interval (CI) 0.14 to 0.68, P value <

> 0.05; parent synchrony: SMD 0.90; 95% CI 0.56 to 1.23, P value < 0.05). Furthermore, there is some evidence suggestive of improvement in child language comprehension, reported by parents (vocabulary comprehension: mean difference (MD 36.26; 95% CI 1.31 to 71.20, P value < 0.05). In addition, there was evidence suggesting a reduction in the severity of children's autism characteristics (SMD -0.30, 95% CI -0.52 to -0.08, P value < 0.05). However, this evidence of change in children's skills and difficulties as a consequence of parent-mediated intervention is uncertain, with small effect sizes and wide CIs, and the conclusions are likely to change with future publication of high-quality RCTs. (Oono, 2013, p. 2)

This conclusion differs from that of the AHRQ draft report, for unclear reasons. It may be because Oono 2013 limited their population to children less than seven, or it may be that the AHRQ draft included more recent studies, since there is nearly a year difference in the literature search end dates (July 2013 for the AHRQ draft and August 2012 for Oono 2013). It also may be variable interpretation of the strength of the evidence by different authors. Indeed, the Oono 2013 review does find a statistically significant benefit in language comprehension and autism severity, outcomes that the AHRQ draft authors assess as having moderate and low strength of evidence respectively. However, Oono 2013 downgrades these findings because they are based on parent self report, and have small effect sizes and wide confidence intervals.

[Evidence Source]

Adolescents and Young Adults (Ages 13 to 30)

Lounds (2012)

Only one poor quality case series evaluated ABA-based intensive behavioral therapy, precluding conclusions regarding efficacy in this age group (Lounds, 2012).

[Evidence Source]

Evidence Summary

Based on the evidence presented in this document (Warren, 2011; AHRQ draft, 2014; Oono, 2013), there is moderate strength of evidence that EIBI improves cognitive and language skills, and low strength of evidence that EIBI improves adaptive behavior skills, social skills, and core symptoms of autism, although improvements are inconsistent. Parent-mediated early intervention improves early language and communication skills, including shared attention and parent synchrony (moderate strength of evidence), and may have some impact on autism symptom severity and early cognition (low strength of evidence). Play-/interaction-based interventions improve child joint attention and language skills (moderate strength of evidence) and play, imitation and social interaction skills (low strength of evidence). The evidence is insufficient to evaluate the effectiveness of ABA on children and adolescents older than twelve. The evidence is insufficient to determine whether there are any factors that modify the effectiveness of ABA therapy.

GRADE-INFORMED FRAMEWORK

The HERC develops recommendations by using the concepts of the Grading of Recommendations Assessment, Development and Evaluation (GRADE) system. GRADE is a transparent and structured process for developing and presenting evidence and for carrying out the steps involved in developing recommendations. There are four elements that determine the strength of a recommendation, as listed in the table below. The HERC reviews the evidence and makes an assessment of each element, which in turn is used to develop the recommendations. Balance between desirable and undesirable effects, and quality of evidence, are derived from the evidence presented in this document, while estimated relative costs, values and preferences are assessments of the HERC members.

Indication/Intervention	Balance between desirable and undesirable effects	Quality of evidence	Resource allocation	Values and preferences	Recommendation
Children aged 1 to 12 years at initiation					
Early Intensive Behavioral Interventions	Benefit on cognitive and language skills	Moderate	High	Low variability	Recommendation for coverage (strong recommendation)
	Benefit on adaptive behavior, social skills and overall autism severity	Low	High	Low variability	
Parent training interventions	Increased joint attention and parent synchrony, and improved early language and communication skills	Moderate	Moderate	Low variability	Recommendation for coverage (strong recommendation)
	Lessened overall severity of autism and improved early cognition	Low	Moderate	Low variability	
Play/interaction-based interventions (including joint attention interventions)	Improvements in joint attention and language skills	Moderate	Low	Low variability	Recommendation for coverage (strong recommendation)
	Short-term improvements in play, imitation, social skills	Low	Low	Low variability	
Adolescents and young adults					
ABA	Unknown	Insufficient	Moderate for focused, high	Low variability	Recommend noncoverage of

Indication/Intervention	Balance between desirable and undesirable effects	Quality of evidence	Resource allocation	Values and preferences	Recommendation
			for more comprehensive		intensive ABA therapies *(weak recommendation)* Recommendation for coverage for specific problem behaviors with focused interventions *(weak recommendation)*

Note: GRADE framework elements are described in Appendix A

SUMMARY CONCLUSIONS

Children ages 1 to 12

Applied behavior analysis (ABA), including early intensive behavioral intervention (EIBI), is recommended for coverage[6] for treatment of autism spectrum disorder[7] (*strong recommendation*).

> Rationale: This strength of recommendation was based on sufficient (moderate quality) evidence and expert input, including testimony on parent/caregiver values and preferences.

Specifically, EIBI (for example, UCLA/Lovaas or ESDM), is recommended for coverage for up to 25 hours per week for a maximum of three years.

> Rationale: The 25-hour limit would be similar to other payers in Oregon that were mandated through SB 365 and earlier Warren report had demonstrated 25 hours per week was effective. There is no evidence that increased intensity beyond this level yields improves outcomes. The duration limit is based on the fact that EIBI studies have a duration of 2-3 years

Initial coverage of EIBI should be provided for up to six months. Ongoing coverage should be based on demonstrated progress towards meaningful predefined objectives (objectives should be achieved as a result of the EIBI, over and beyond gains that would be expected to arise from maturation alone) using standardized, multimodal assessments, no more frequently than every six months *(strong recommendation).* Examples of such assessments include Vineland, IQ tests (Mullen, WPPSI, WISC-R), language measures, behavioral checklists (CBCL, ABC), and autistic symptoms measures (SRS).

> Rationale: Ensuring that patients are making meaningful progress is important to ensure quality outcomes and effective use of resources. The six month assessment was chosen based on expert input and subcommittee deliberation to allow for sufficient time for progress while not being burdensome to providers and plans.

Less intensive ABA-based interventions

If EIBI is not indicated, has been completed, or there is not sufficient progress toward multidimensional goals, then less intensive behavioral ABA-based interventions (such as parent training, play/interaction based interventions, and joint attention interventions)

[6] These conclusions apply to the Oregon Health Plan as governed by the Prioritized List of Health Services and to no other health plan.
[7] Autism spectrum disorder should be diagnosed by a qualified health care professional according to DSM-5 criteria.

are recommended for coverage to address core symptoms of autism and/or specific problem areas *(strong recommendation)* for up to 8 hours per month. In extenuating circumstances (e.g severe aggressive behavior that is responding to interventions but requires increased intensity), an additional 8 hours per month is recommended for coverage. Initial coverage should be provided for six months. Ongoing coverage should be based on demonstrated progress towards meaningful predefined objectives or emergence of new problem behaviors.

> Rationale: Not all autistic children require comprehensive therapy and less intensive interventions will be appropriate for many, or appropriate for those who have completed intensive intervention. Evidence supports these less intensive interventions in this age group. Eight hours was chosen based on a wide range of intensity in the literature, expert input, and previous HERC Prioritized List guideline precedent.

Parent/caregiver involvement and training is recommended to be a component of treatment *(strong recommendation)*.

> Rationale: Evidence and expert input indicated that parental involvement in ABA is a key part of effective treatment. Parent delivered therapy is effective.

Individuals ages 13 and older

Intensive ABA is not recommended for coverage for treatment of autism spectrum disorder in persons ages 13 and older (*weak recommendation*).

> Rationale: There is insufficient evidence to support intensive ABA treatment at older ages.

For individuals age 13 and older, targeted behavioral interventions, including focused ABA*, are recommended for coverage for up to 8 hours per month, up to 6 months, only to address specific problem behaviors (*weak recommendation*). Behaviors eligible for coverage include those which place the member at risk for harm or create significant daily issues related to care, education, or other important functions. The interventions should involve predefined behavioral objectives that would result in socially important and sustainable outcomes for the individual. Ongoing coverage should be based on demonstrated progress towards meaningful predefined objectives with ongoing proof of medical appropriateness, or emergence of new problem behaviors.

Rationale: According to the trusted evidence source, there is insufficient evidence to support ABA-based interventions in this age group. Public comment and some expert testimony involved submission of many single subject research design studies to support treatment in this age group, but the quality of this evidence did not meet predetermined criteria for inclusion. The subcommittee agreed that problem behaviors can be challenging to the individual, caregivers, and society and it is reasonable to consider targeted interventions for specific problem behaviors as long as there are clear objectives, progress toward meaningful predefined goals and ongoing proof of medical appropriateness. The net result was to recommend targeted interventions including ABA-based treatments for limited intensity to address problem behaviors. Six months was chosen based on expert testimony and subcommittee discussion that more frequent assessments would potentially be burdensome to providers and plans.

Parent/caregiver involvement and training is encouraged *(weak recommendation)*

Note: The evidence for the treatment of conditions comorbid with autism spectrum disorder is beyond the scope of this evidence summary.

POLICY LANDSCAPE

No quality measures were identified when searching the National Quality Measures Clearinghouse pertaining to autism and applied behavioral analysis.

COMMITTEE DELIBERATIONS – EVIDENCE-BASED GUIDELINES SUBCOMMITTEE

COMMITTEE DELIBERATIONS – VALUE-BASED BENEFITS SUBCOMMITTEE

This report is prepared by the Health Evidence Review Commission (HERC), HERC staff, and subcommittee members. The evidence summary is prepared by the Center for Evidence-based Policy at Oregon Health & Science University (the Center). This document is intended to guide HERC in making informed decisions about the prioritization of health care services for the Oregon Health Plan.

The Center is not engaged in rendering any clinical, legal, business or other professional advice. The statements in this document do not represent official policy positions of the Center. Researchers involved in preparing this document have no affiliations or financial involvement that conflict with material presented in this document.

Appendix A. GRADE Element Descriptions

Element	Description
Balance between desirable and undesirable effects	The larger the difference between the desirable and undesirable effects, the higher the likelihood that a strong recommendation is warranted. The narrower the gradient, the higher the likelihood that a weak recommendation is warranted
Quality of evidence	The higher the quality of evidence, the higher the likelihood that a strong recommendation is warranted
Resource allocation	The higher the costs of an intervention—that is, the greater the resources consumed—the lower the likelihood that a strong recommendation is warranted
Values and preferences	The more values and preferences vary, or the greater the uncertainty in values and preferences, the higher the likelihood that a weak recommendation is warranted

Strong recommendation

In Favor: The subcommittee is confident that the desirable effects of adherence to a recommendation outweigh the undesirable effects, considering the quality of evidence, cost and resource allocation, and values and preferences.

Against: The subcommittee is confident that the undesirable effects of adherence to a recommendation outweigh the desirable effects, considering the quality of evidence, cost and resource allocation, and values and preferences.

Weak recommendation

In Favor: the subcommittee concludes that the desirable effects of adherence to a recommendation probably outweigh the undesirable effects, considering the quality of evidence, cost and resource allocation, and values and preferences, but is not confident.

Against: the subcommittee concludes that the undesirable effects of adherence to a recommendation probably outweigh the desirable effects, considering the quality of evidence, cost and resource allocation, and values and preferences, but is not confident.

Quality of evidence across studies for the treatment/outcome

High = Further research is very unlikely to change our confidence in the estimate of effect.

Moderate = Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.

Low = Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.

Very low = Any estimate of effect is very uncertain.

Appendix B. Potentially Applicable Codes

CODES	DESCRIPTION
ICD-9 Diagnosis Codes	
299.00	Autistic disorder, current or active state
299.01	Autistic disorder, residual state
299.10	Childhood disintegrative disorder, current or active state
299.11	Childhood disintegrative disorder, residual state
299.80	Other specified pervasive developmental disorders, current or active state
299.81	Other specified pervasive developmental disorders, residual state
299.90	Unspecified pervasive developmental disorder, current or active state
299.91	Unspecified pervasive developmental disorder, residual state
ICD-10 Diagnosis Codes	
F84.0	Autistic disorder
F84.2	Rett's syndrome
F84.3	Other childhood disintegrative disorder
F84.5	Asperger's syndrome
F84.8	Other pervasive developmental disorders
ICD-9 Volume 3 (Procedure Codes)	
None	
Procedure Codes	
Until July, 2014, no specific procedure codes exist for Applied Behavior Analysis. The list below provides examples of how various state Medicaid agencies covering ABA instruct providers to bill. Temporary codes shown in italics will be available starting July, 2014.	
90834	Psychotherapy, 45 min
90837	Psychotherapy, 60 min
0359T	*Behavior identification assessment, by the physician or other qualified health care professional, face-to-face with patient and caregiver(s), includes administration of standardized and non-standardized tests, detailed behavioral history, patient observation and caregiver interview, interpretation of test results, discussion of findings and recommendations with the primary guardian(s)/caregiver(s), and preparation of report*
0360T	*Observational behavioral follow-up assessment, includes physician or other qualified health care professional direction with interpretation and report, administered by one technician; first 30 minutes of technician time, face-to-face with the patient*
0361T	*…additional 30 minutes*
0362T	*Exposure behavioral follow-up assessment, includes physician or other qualified health care professional direction with interpretation and report, administered by physician or other qualified health care professional with the assistance of one or more technicians; first 30 minutes of technician(s) time, face-to-face with the patient*
0363T	*… additional 30 minutes*
0364T	*Adaptive behavior treatment by protocol, administered by technician, face-to-face with one patient; first 30 minutes of technician time*
0365T	*…additional 30 minutes*

CODES	DESCRIPTION
0366T	*Group adaptive behavior treatment by protocol, administered by technician, face-to-face with two or more patients; first 30 minutes of technician time*
0367T	*….additional 30 minutes*
0368T	*Adaptive behavior treatment with protocol modification administered by physician or other qualified health care professional with one patient; first 30 minutes of patient face-to- face time*
0369T	*Adaptive behavior treatment with protocol modification, additional 30 minutes*
0370T	*Family adaptive behavior treatment guidance, administered by physician or other qualified health care professional (without the patient present)*
0371T	*Multiple-family group adaptive behavior treatment guidance, administered by physician or other qualified health care professional (without the patient present)*
0372T	*Adaptive behavior treatment social skills group, administered by physician or other qualified health care professional face-to-face with multiple patients*
0373T	*Exposure adaptive behavior treatment with protocol modification requiring two or more technicians for severe maladaptive behavior(s); first 60 minutes of technicians' time, face-to-face with patient*
0374T	*each additional 30 minutes of technicians' time face-to-face with patient (List separately in addition to code for primary procedure)*
G1076	Activity therapy, such as music, dance, art or play not for recreation, related to the care and treatment of patient's disabling mental health problems (45 min or more)
G1077	Training and educational services related to the care and treatment of patient's disabling mental health problems (45 min or more)
H0002	Behavioral health screening to determine eligibility for admission to treatment program
H0004	Behavioral health counseling and therapy, per 15 minutes
H0031	Mental health assessment by non-physician
H0032	Mental health service plan development by non-physician
H2000	Comprehensive multidisciplinary evaluation
H2010	Comprehensive medication services, per 15 minutes
H2019	Therapeutic behavioral service, per 15 minutes
H2020	Therapeutic behavioral service, per diem
H2027	Psychoeducational service, per 15 min
T1023	Screening to determine the appropriateness of consideration of an individual for participation in a specified program, project or treatment protocol, per encounter
T1024	Evaluation and treatment by an integrated, specialty team contracted to provide coordinated care to multiple or severely handicapped children, per encounter
T1027	Family training and counseling for child development, per 15 min
T2013	Habilitation, educational, waiver, per hour
T2026	Specialized childcare, waiver, per diem

Note: Inclusion on this list does not guarantee coverage

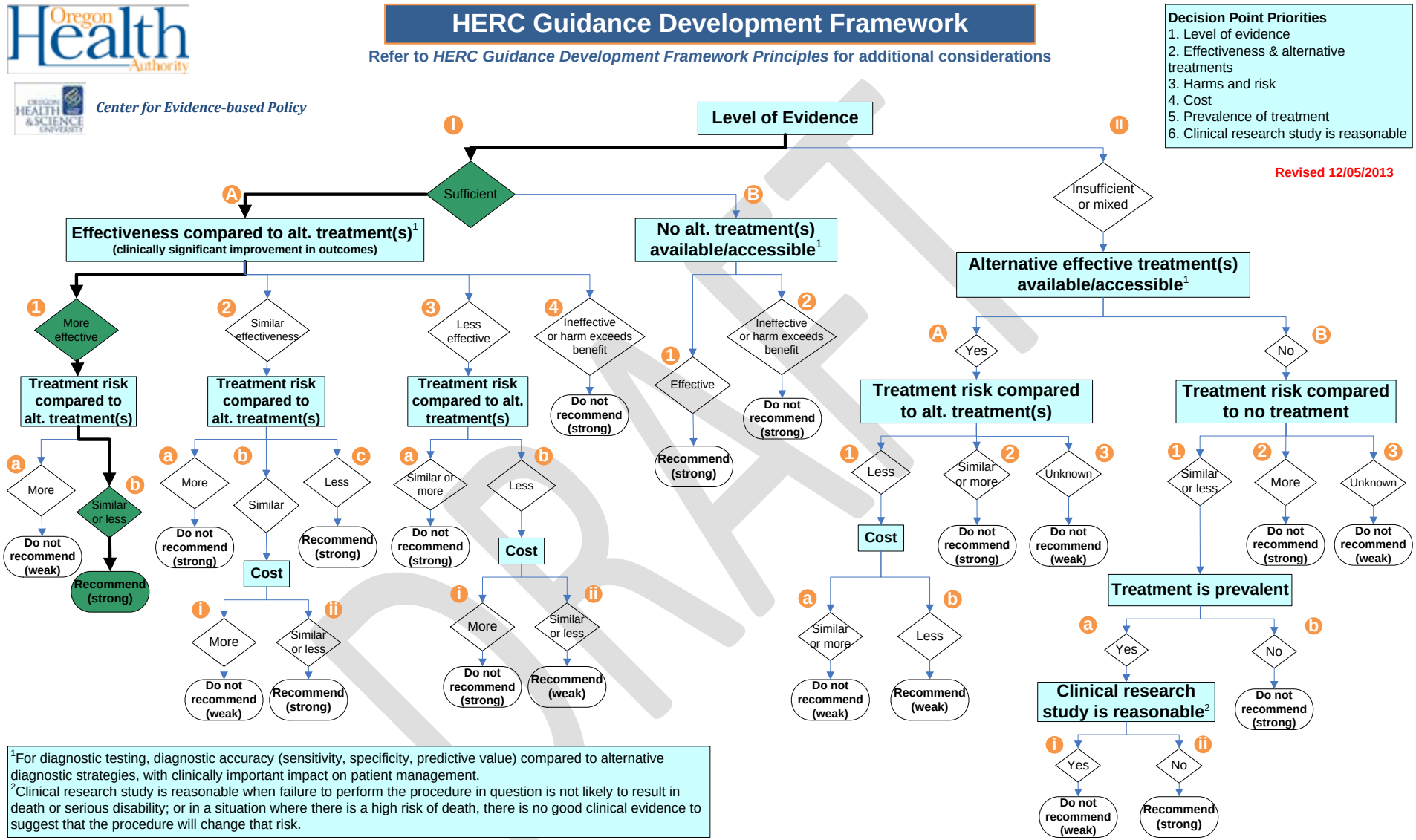
Appendix C. HERC Guidance Development Framework

HERC Guidance Development Framework Principles

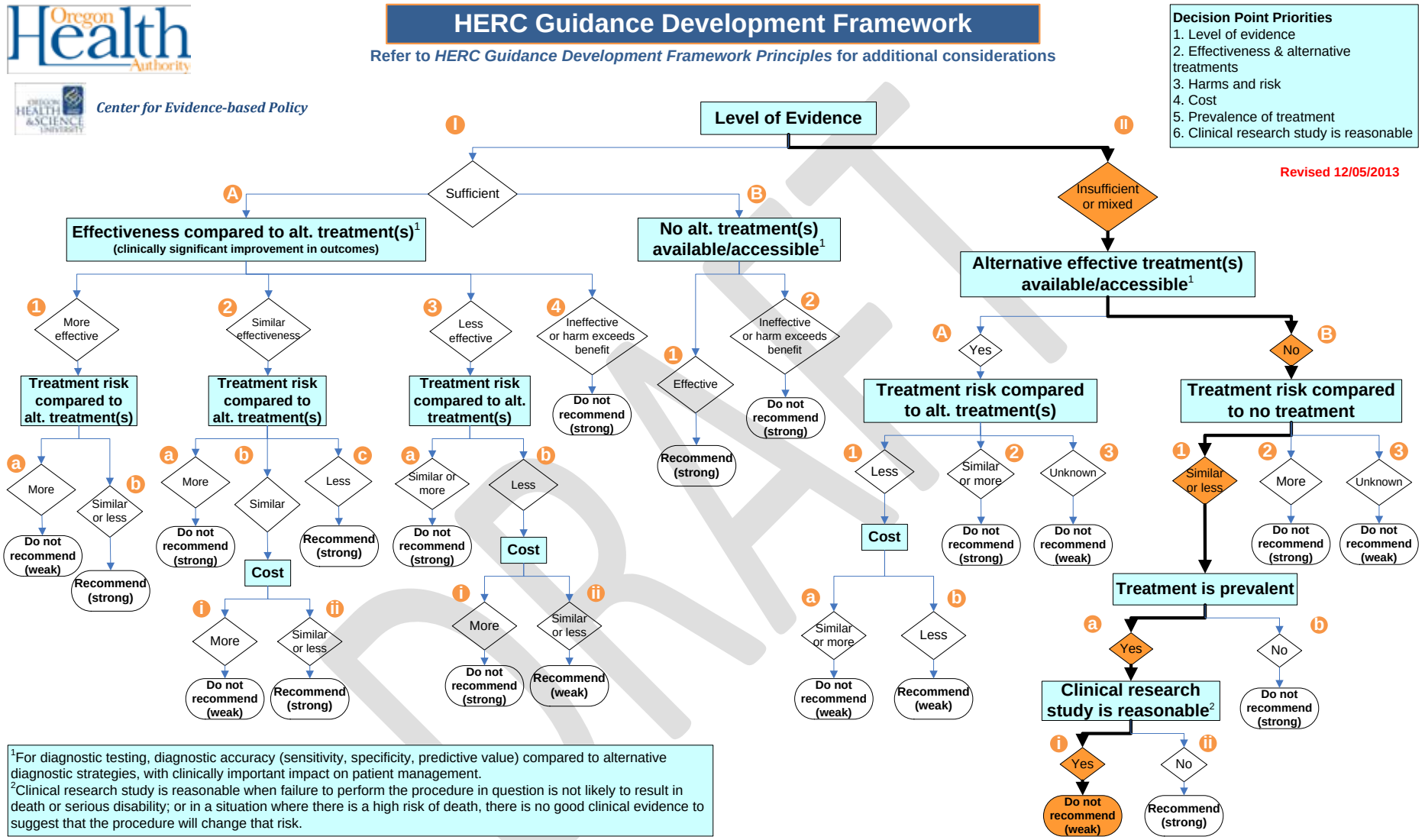
This framework was developed to assist with the decision making process for the Oregon policy-making body, the HERC and its subcommittees. It is a general guide, and must be used in the context of clinical judgment. It is not possible to include all possible scenarios and factors that may influence a policy decision in a graphic format. While this framework provides a general structure, factors that may influence decisions that are not captured on the framework include but are not limited to the following:

- Estimate of the level of risk associated with the treatment, or any alternatives;
- Which alternatives the treatment should most appropriately be compared to;
- Whether there is a discrete and clear diagnosis;
- The definition of clinical significance for a particular treatment, and the expected margin of benefit compared to alternatives;
- The relative balance of benefit compared to harm;
- The degree of benefit compared to cost; e.g., if the benefit is small and the cost is large, the committee may make a decision different than the algorithm suggests;
- Specific indications and contraindications that may determine appropriateness;
- Expected values and preferences of patients

ABABA-based Treatments for Children Aged 1 to 12, including EIBI and Other Less Intensive Interventions



[1]For diagnostic testing, diagnostic accuracy (sensitivity, specificity, predictive value) compared to alternative diagnostic strategies, with clinically important impact on patient management.
[2]Clinical research study is reasonable when failure to perform the procedure in question is not likely to result in death or serious disability; or in a situation where there is a high risk of death, there is no good clinical evidence to suggest that the procedure will change that risk.


Oregon Health Authority
Center for Evidence-based Policy
HERC Guidance Development Framework
Refer to HERC Guidance Development Framework Principles for additional considerations
Decision Point Priorities
1. Level of evidence
2. Effectiveness & alternative treatments
3. Harms and risk
4. Cost
5. Prevalence of treatment
6. Clinical research study is reasonable
Revised 12/05/2013
Level of Evidence
Sufficient
Insufficient or mixed
Effectiveness compared to alt. treatment(s)[1] (clinically significant improvement in outcomes)
No alt. treatment(s) available/accessible[1]
Alternative effective treatment(s) available/accessible[1]
More effective
Similar effectiveness
Less effective
Ineffective or harm exceeds benefit
Effective
Ineffective or harm exceeds benefit
Yes
No
Treatment risk compared to alt. treatment(s)
Treatment risk compared to alt. treatment(s)
Treatment risk compared to alt. treatment(s)
Do not recommend (strong)
Recommend (strong)
Do not recommend (strong)
Treatment risk compared to alt. treatment(s)
Treatment risk compared to no treatment
More
Similar or less
More
Similar
Less
Similar or more
Less
Less
Similar or more
Unknown
Similar or less
More
Unknown
Do not recommend (weak)
Recommend (strong)
Do not recommend (strong)
Recommend (strong)
Do not recommend (strong)
Cost
Do not recommend (strong)
Cost
Do not recommend (strong)
Do not recommend (weak)
Do not recommend (strong)
Do not recommend (weak)
Treatment is prevalent
More
Similar or less
More
Similar or less
Similar or more
Less
Yes
No
Do not recommend (weak)
Recommend (weak)
Recommend (weak)
Clinical research study is reasonable[2]
Do not recommend (strong)
Yes
No
Yes
No
Do not recommend (weak)
Recommend (strong)
[1]For diagnostic testing, diagnostic accuracy (sensitivity, specificity, predictive value) compared to alternative diagnostic strategies, with clinically important impact on patient management.
[2]Clinical research study is reasonable when failure to perform the procedure in question is not likely to result in death or serious disability; or in a situation where there is a high risk of death, there is no good clinical evidence to suggest that the procedure will change that risk.

Appendix D. Key References from Evidence Sources

References for Included Studies in Oono 2013

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Green J, Charman T, McConachie H, Aldred C, Slonims V, Howlin P, et al. Parent-mediated communication-focused treatment in children with autism (PACT): a randomised controlled trial. *Lancet* 2010;375(9732):2152–60. *{published data only}*

Jocelyn LJ, Casiro OG, Beattie D, Bow J, Kneisz J. Treatment of children with autism: a randomised controlled trial to evaluate a caregiver-based intervention program in community day-care centres. *Journal of Developmental & Behavioral Pediatrics* 1998;19(5):326–34. *{published data only}*

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Smith T, Groen AD, Wynn JW. Randomized trial of intensive early intervention for children with pervasive developmental disorder. *American Journal on Mental Retardation* 2000;105(4):269–85. *{published data only}*

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Enrolled
Senate Bill 365

Sponsored by Senators BATES, EDWARDS; Senators DEVLIN, HASS, JOHNSON, Representatives CONGER, MCLANE, PARRISH (Presession filed.)

CHAPTER .....

AN ACT

Relating to treatment for autism spectrum disorders; creating new provisions; amending ORS 676.610, 676.612, 676.613, 676.622, 676.625, 676.992, 743A.190 and 750.055; and declaring an emergency.

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

SECTION 1. Section 2 of this 2013 Act is added to and made a part of the Insurance Code.

SECTION 2. (1) As used in this section and sections 3 and 3a of this 2013 Act:

(a)(A) "Applied behavior analysis" means the design, implementation and evaluation of environmental modifications, using behavioral stimuli and consequences, to produce significant improvement in human social behavior, including the use of direct observation, measurement and functional analysis of the relationship between environment and behavior and that is provided by:

(i) A licensed health care professional registered under section 3 of this 2013 Act;

(ii) A behavior analyst or an assistant behavior analyst licensed under section 3 of this 2013 Act; or

(iii) A behavior analysis interventionist registered under section 3 of this 2013 Act.

(B) "Applied behavior analysis" excludes psychological testing, neuropsychology, psychotherapy, cognitive therapy, sex therapy, psychoanalysis, hypnotherapy and long-term counseling as treatment modalities.

(b) "Autism spectrum disorder" has the meaning given that term in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) published by the American Psychiatric Association.

(c) "Diagnosis" means medically necessary assessment, evaluation or testing.

(d) "Health benefit plan" has the meaning given that term in ORS 743.730.

(e) "Medically necessary" means in accordance with the definition of medical necessity that is specified in the policy or certificate for the health benefit plan and that applies to all covered services under the plan.

(f) "Treatment for autism spectrum disorder" includes applied behavior analysis for up to 25 hours per week and any other mental health or medical services identified in the individualized treatment plan, as described in subsection (6) of this section.

(2) A health benefit plan shall provide coverage of:

(a) The screening for and diagnosis of autism spectrum disorder by a licensed neurologist, pediatric neurologist, developmental pediatrician, psychiatrist or psychologist, who has experience or training in the diagnosis of autism spectrum disorder; and

(b) Medically necessary treatment for autism spectrum disorder and the management of care, for an individual who begins treatment before nine years of age, subject to the requirements of this section.

(3) This section does not require coverage for:

(a) Services provided by a family or household member;

(b) Services that are custodial in nature or that constitute marital, family, educational or training services;

(c) Custodial or respite care, equine assisted therapy, creative arts therapy, wilderness or adventure camps, social counseling, telemedicine, music therapy, neurofeedback, chelation or hyperbaric chambers;

(d) Services provided under an individual education plan in accordance with the Individuals with Disabilities Education Act, 20 U.S.C. 1400 et seq.;

(e) Services provided through community or social programs; or

(f) Services provided by the Department of Human Services or the Oregon Health Authority, other than employee benefit plans offered by the department and the authority.

(4) An insurer may not terminate coverage or refuse to issue or renew coverage for an individual solely because the individual has received a diagnosis of autism spectrum disorder or has received treatment for autism spectrum disorder.

(5) Coverage under this section may be subject to utilization controls that are reasonable in the context of individual determinations of medical necessity. An insurer may require:

(a) An autism spectrum disorder diagnosis by a professional described in subsection (2)(a) of this section if the original diagnosis was not made by a professional described in subsection (2)(a) of this section.

(b) Prior authorization for coverage of a maximum of 25 hours per week of applied behavior analysis recommended in an individualized treatment plan approved by a professional described in subsection (2)(a) of this section for an individual with autism spectrum disorder, as long as the insurer makes a prior authorization determination no later than 30 calendar days after receiving the request for prior authorization.

(6) If an individual is receiving applied behavior analysis, an insurer may require submission of an individualized treatment plan, which shall include all elements necessary for the insurer to appropriately determine coverage under the health benefit plan. The individualized treatment plan must be based on evidence-based screening criteria. An insurer may require an updated individualized treatment plan, not more than once every six months, that includes observed progress as of the date the updated plan was prepared, for the purpose of performing utilization review and medical management. The insurer may require the individualized treatment plan to be approved by a professional described in subsection (2)(a) of this section, and to include the:

(a) Diagnosis;

(b) Proposed treatment by type;

(c) Frequency and anticipated duration of treatment;

(d) Anticipated outcomes stated as goals, including specific cognitive, social, communicative, self-care and behavioral goals that are clearly stated, directly observed and continually measured and that address the characteristics of the autism spectrum disorder; and

(e) Signature of the treating provider.

(7)(a) Once coverage for applied behavior analysis has been approved, the coverage continues as long as:

(A) The individual continues to make progress toward the majority of the goals of the individualized treatment plan; and

(B) Applied behavior analysis is medically necessary.

(b) An insurer may require periodic review of an individualized treatment plan, as described in subsection (6) of this section, and modification of the individualized treatment plan

if the review shows that the individual receiving the treatment is not making substantial clinical progress toward the goals of the individualized treatment plan.

(8) Coverage under this section may be subject to requirements and limitations no more restrictive than those imposed on coverage or reimbursement of expenses arising from the treatment of other medical conditions under the policy or certificate, including but not limited to:

(a) Requirements and limitations regarding in-network providers; and

(b) Provisions relating to deductibles, copayments and coinsurance.

(9) This section applies to coverage for up to 25 hours per week of applied behavior analysis for an individual if the coverage is first requested when the individual is under nine years of age. This section does not limit coverage for any services that are otherwise available to an individual under ORS 743A.168 or 743A.190, including but not limited to:

(a) Treatment for autism spectrum disorder other than applied behavior analysis or the services described in subsection (3) of this section.

(b) Applied behavior analysis for more than 25 hours per week; or

(c) Applied behavior analysis for an individual if the coverage is first requested when the individual is nine years of age or older.

(10) Coverage under this section includes treatment for autism spectrum disorder provided in the individual's home or a licensed health care facility or, for treatment provided by a licensed health care professional registered with the Behavior Analysis Regulatory Board or a behavior analyst or assistant behavior analyst licensed under section 3 of this 2013 Act, in a setting approved by the health care professional, behavior analyst or assistant behavior analyst.

(11) An insurer that provides coverage of applied behavior analysis in accordance with a decision of an independent review organization that was made prior to January 1, 2016, shall continue to provide coverage, subject to modifications made in accordance with subsection (7) of this section.

(12) ORS 743A.001 does not apply to this section.

SECTION 3. (1) There is created, within the Oregon Health Licensing Agency, the Behavior Analysis Regulatory Board consisting of seven members appointed by the Governor, including:

(a) Three members who are licensed by the board;

(b) One member who is a licensed psychiatrist or developmental pediatrician, with experience or training in treating autism spectrum disorder;

(c) One member who is a licensed psychologist registered with the board;

(d) One member who is a licensed speech-language pathologist registered with the board; and

(e) One member of the general public who does not have a financial interest in the provision of applied behavior analysis and does not have a ward or family member who has been diagnosed with autism spectrum disorder.

(2) Not more than one member of the Behavior Analysis Regulatory Board may be an employee of an insurer.

(3) The term of office of each member is four years, but a member serves at the pleasure of the Governor. Before the expiration of the term of a member, the Governor shall appoint a successor whose term begins on November 1 next following. A member is eligible for reappointment. If there is a vacancy for any cause, the Governor shall make an appointment to become immediately effective for the unexpired term.

(4) A member of the Behavior Analysis Regulatory Board is entitled to compensation and expenses as provided in ORS 292.495.

(5) The Behavior Analysis Regulatory Board shall select one of its members as chairperson and another as vice chairperson, for such terms and with duties and powers necessary for the performance of the functions of such offices as the board determines.

(6) A majority of the members of the Behavior Analysis Regulatory Board constitutes a quorum for the transaction of business.

(7) The Behavior Analysis Regulatory Board shall meet at least once every three months at a place, day and hour determined by the board. The board may also meet at other times and places specified by the call of the chairperson or of a majority of the members of the board.

(8) In accordance with ORS chapter 183, the Behavior Analysis Regulatory Board shall establish by rule criteria for the:

(a) Licensing of:

(A) Behavior analysts; and

(B) Assistant behavior analysts; and

(b) Registration of:

(A) Licensed health care professionals; and

(B) Behavior analysis interventionists.

(9) The criteria for the licensing of a behavior analyst must include, but are not limited to, the requirement that the applicant:

(a) Be certified by the Behavior Analyst Certification Board, Incorporated, as a Board Certified Behavior Analyst; and

(b) Have successfully completed a criminal records check.

(10) The criteria for the licensing of an assistant behavior analyst must include, but are not limited to, the requirement that the applicant:

(a) Be certified by the Behavior Analyst Certification Board, Incorporated, as a Board Certified Assistant Behavior Analyst;

(b) Be supervised by a behavior analyst who is licensed by the Behavior Analysis Regulatory Board; and

(c) Have successfully completed a criminal records check.

(11) The criteria for the registration of a behavior analysis interventionist must include, but are not limited to, the requirement that the applicant:

(a) Have completed coursework and training prescribed by the Behavior Analysis Regulatory Board by rule;

(b) Receive ongoing oversight by a licensed behavior analyst or a licensed assistant behavior analyst, or by another licensed health care professional approved by the board; and

(c) Have successfully completed a criminal records check.

(12) In accordance with applicable provisions of ORS chapter 183, the Behavior Analysis Regulatory Board shall adopt rules:

(a) Establishing standards and procedures for the licensing of behavior analysts and assistant behavior analysts and for the registration of licensed health care professionals and behavior analysis interventionists in accordance with this section;

(b) Establishing guidelines for the professional methods and procedures to be used by individuals licensed and registered under this section;

(c) Governing the examination of applicants for licenses and registrations under this section and the renewal, suspension and revocation of the licenses and registrations; and

(d) Establishing fees sufficient to cover the costs of administering the licensing and registration procedures under this section.

(13) The Behavior Analysis Regulatory Board shall issue a license to an applicant who:

(a) Files an application in the form prescribed by the board;

(b) Pays fees established by the board; and

(c) Demonstrates to the satisfaction of the board that the applicant meets the criteria adopted under this section.

(14) The Behavior Analysis Regulatory Board shall establish the procedures for the registration of licensed health care professionals and behavior analysis interventionists.

(15) All moneys received by the Behavior Analysis Regulatory Board under subsection (13) of this section shall be paid into the General Fund of the State Treasury and credited to the Oregon Health Licensing Agency Account.

(16) An individual who has not been licensed or registered by the Behavior Analysis Regulatory Board in accordance with criteria and standards adopted under this section may not claim reimbursement for services described in section 2 of this 2013 Act under a health benefit plan or under a self-insured health plan offered by the Public Employees' Benefit Board or the Oregon Educators Benefit Board.

SECTION 3a. (1) Notwithstanding the composition of the Behavior Analysis Regulatory Board specified in section 3 of this 2013 Act, for the period beginning on the operative date of section 3 of this 2013 Act and ending on October 31, 2015, the board shall consist of seven members appointed by the Governor, including:

(a) Three members who are certified by the Behavior Analyst Certification Board, Incorporated, as Board Certified Behavior Analysts;

(b) One member who is a licensed psychiatrist or developmental pediatrician and who has experience or training in applied behavior analysis;

(c) One member who is a licensed psychologist and who has experience in the diagnosis or treatment of autism spectrum disorders;

(d) One member who is a licensed speech-language pathologist and who has experience or training in applied behavior analysis; and

(e) One member of the general public who does not have a financial interest in the provision of applied behavior analysis and does not have a ward or family member who has been diagnosed with autism spectrum disorder.

(2) Notwithstanding the term of office specified by section 3 of this 2013 Act, if members first appointed to the Behavior Analysis Regulatory Board under this section continue to serve after October 31, 2015, the board shall adopt a method for establishing the terms of office of board members so that the terms of office do not all expire on the same date.

SECTION 4. Notwithstanding section 3 (16) of this 2013 Act, an individual actively practicing applied behavior analysis on the effective date of this 2013 Act may continue to claim reimbursement from a health benefit plan, the Public Employees' Benefit Board or the Oregon Educators Board for services provided without a license before January 1, 2016.

SECTION 5. The Oregon Health Licensing Agency may take any action before November 1, 2013, that is necessary for the agency to implement the provisions of sections 3 and 3a of this 2013 Act on and after November 1, 2013.

SECTION 6. Not later than August 30, 2013, the Health Evidence Review Commission shall begin the process of evaluating applied behavior analysis, as defined in section 2 of this 2013 Act, as a treatment for autism spectrum disorder, as defined in section 2 of this 2013 Act, for the purpose of updating the list of health services recommended under ORS 414.690. Any adjustments to the list of health services that result from the evaluation process must be implemented not later than:

(1) October 1, 2014, if the adjustments do not require the development of new medical coding; and

(2) April 1, 2015, if the adjustments require the development or adoption of new medical coding.

SECTION 7. ORS 743A.190 is amended to read:

743A.190. (1) A health benefit plan, as defined in ORS 743.730, must cover for a child enrolled in the plan who is under 18 years of age and who has been diagnosed with a pervasive developmental disorder all medical services, including rehabilitation services, that are medically necessary and are otherwise covered under the plan.

(2) The coverage required under subsection (1) of this section, including rehabilitation services, may be made subject to other provisions of the health benefit plan that apply to covered services, including but not limited to:

(a) Deductibles, copayments or coinsurance;

(b) Prior authorization or utilization review requirements; or

(c) Treatment limitations regarding the number of visits or the duration of treatment.

(3) As used in this section:

(a) "Medically necessary" means in accordance with the definition of medical necessity that is specified in the policy, certificate or contract for the health benefit plan and that applies uniformly to all covered services under the health benefit plan.

(b) "Pervasive developmental disorder" means a neurological condition that includes [*Asperger's syndrome,*] autism **spectrum disorder**, developmental delay, developmental disability or mental retardation.

(c) "Rehabilitation services" means physical therapy, occupational therapy or speech therapy services to restore or improve function.

(4) The provisions of ORS 743A.001 do not apply to this section.

(5) The definition of "pervasive developmental disorder" is not intended to apply to coverage required under ORS 743A.168 **or section 2 of this 2013 Act**.

SECTION 8. ORS 750.055, as amended by section 3, chapter 21, Oregon Laws 2012, is amended to read:

750.055. (1) The following provisions of the Insurance Code apply to health care service contractors to the extent not inconsistent with the express provisions of ORS 750.005 to 750.095:

(a) ORS 705.137, 705.139, 731.004 to 731.150, 731.162, 731.216 to 731.362, 731.382, 731.385, 731.386, 731.390, 731.398 to 731.430, 731.428, 731.450, 731.454, 731.488, 731.504, 731.508, 731.509, 731.510, 731.511, 731.512, 731.574 to 731.620, 731.592, 731.594, 731.640 to 731.652, 731.730, 731.731, 731.735, 731.737, 731.750, 731.752, 731.804, 731.844 to 731.992, 731.870 and 743.061.

(b) ORS 732.215, 732.220, 732.230, 732.245, 732.250, 732.320, 732.325 and 732.517 to 732.592, not including ORS 732.582.

(c) ORS 733.010 to 733.050, 733.080, 733.140 to 733.170, 733.210, 733.510 to 733.680 and 733.695 to 733.780.

(d) ORS chapter 734.

(e) ORS 742.001 to 742.009, 742.013, 742.061, 742.065, 742.150 to 742.162, 742.400, 742.520 to 742.540, 743.010, 743.013, 743.018 to 743.030, 743.050, 743.100 to 743.109, 743.402, 743.472, 743.492, 743.495, 743.498, 743.499, 743.522, 743.523, 743.524, 743.526, 743.527, 743.528, 743.529, 743.549 to 743.552, 743.560, 743.600 to 743.610, 743.650 to 743.656, 743.764, 743.804, 743.807, 743.808, 743.814 to 743.839, 743.842, 743.845, 743.847, 743.854, 743.856, 743.857, 743.858, 743.859, 743.861, 743.862, 743.863, 743.864, 743.894, 743.911, 743.912, 743.913, 743.917, 743A.010, 743A.012, 743A.020, 743A.034, 743A.036, 743A.048, 743A.058, 743A.062, 743A.064, 743A.065, 743A.066, 743A.068, 743A.070, 743A.080, 743A.084, 743A.088, 743A.090, 743A.100, 743A.104, 743A.105, 743A.110, 743A.140, 743A.141, 743A.144, 743A.148, 743A.160, 743A.164, 743A.168, 743A.170, 743A.175, 743A.184, 743A.185, 743A.188, 743A.190 and 743A.192 and section 2, chapter 21, Oregon Laws 2012**, and section 2 of this 2013 Act**.

(f) The provisions of ORS chapter 744 relating to the regulation of insurance producers.

(g) ORS 746.005 to 746.140, 746.160, 746.220 to 746.370, 746.600, 746.605, 746.607, 746.608, 746.610, 746.615, 746.625, 746.635, 746.650, 746.655, 746.660, 746.668, 746.670, 746.675, 746.680 and 746.690.

(h) ORS 743A.024, except in the case of group practice health maintenance organizations that are federally qualified pursuant to Title XIII of the Public Health Service Act unless the patient is referred by a physician associated with a group practice health maintenance organization.

(i) ORS 735.600 to 735.650.

(j) ORS 743.680 to 743.689.

(k) ORS 744.700 to 744.740.

(L) ORS 743.730 to 743.773.

(m) ORS 731.485, except in the case of a group practice health maintenance organization that is federally qualified pursuant to Title XIII of the Public Health Service Act and that wholly owns and operates an in-house drug outlet.

(2) For the purposes of this section, health care service contractors shall be deemed insurers.

(3) Any for-profit health care service contractor organized under the laws of any other state that is not governed by the insurance laws of the other state is subject to all requirements of ORS chapter 732.

(4) The Director of the Department of Consumer and Business Services may, after notice and hearing, adopt reasonable rules not inconsistent with this section and ORS 750.003, 750.005, 750.025 and 750.045 that are deemed necessary for the proper administration of these provisions.

SECTION 9. Section 10 of this 2013 Act is added to and made a part of ORS chapter 343.

SECTION 10. (1) Section 2 of this 2013 Act does not limit, replace or affect any obligation of a school district to provide services under an individualized education program to a child with a disability in accordance with the Individuals with Disabilities Education Act, 20 U.S.C. 1400 et seq., or other publicly funded programs to assist individuals with autism spectrum disorder.

(2) Any governmental or educational entity providing services as required under the Individuals with Disabilities Education Act, 20 U.S.C. 1400 et seq., as amended, or other state or federal law requiring the provision of services to individuals with disabilities, is prohibited from reducing, eliminating or shifting required services to coverage provided under section 2 of this 2013 Act.

SECTION 11. In the manner prescribed in ORS chapter 183 for contested cases, the Oregon Health Licensing Agency may impose a form of discipline listed in ORS 676.612 against any person licensed or registered under section 3 of this 2013 Act for any of the prohibited acts listed in ORS 676.612 and for any violation of a rule adopted under section 3 of this 2013 Act.

SECTION 12. ORS 676.610 is amended to read:

676.610. (1)(a) The Oregon Health Licensing Agency is under the supervision and control of a director, who is responsible for the performance of the duties, functions and powers and for the organization of the agency.

(b) The Director of the Oregon Department of Administrative Services shall establish the qualifications for and appoint the Director of the Oregon Health Licensing Agency, who holds office at the pleasure of the Director of the Oregon Department of Administrative Services.

(c) The Director of the Oregon Health Licensing Agency shall receive a salary as provided by law or, if not so provided, as prescribed by the Director of the Oregon Department of Administrative Services.

(d) The Director of the Oregon Health Licensing Agency is in the unclassified service.

(2) The Director of the Oregon Health Licensing Agency shall provide the boards, councils and programs administered by the agency with such services and employees as the agency requires to carry out the agency's duties. Subject to any applicable provisions of the State Personnel Relations Law, the Director of the Oregon Health Licensing Agency shall appoint all subordinate officers and employees of the agency, prescribe their duties and fix their compensation.

(3) The Director of the Oregon Health Licensing Agency is responsible for carrying out the duties, functions and powers under ORS 675.360 to 675.410, 676.605 to 676.625, 676.992, 678.710 to 678.820, 680.500 to 680.565, 687.405 to 687.495, 687.895, 688.701 to 688.734, 688.800 to 688.840, 690.005 to 690.235, 690.350 to 690.415, 691.405 to 691.485 and 694.015 to 694.185 **and sections 3 and 11 of this 2013 Act** and ORS chapter 700.

(4) The enumeration of duties, functions and powers in subsection (3) of this section is not intended to be exclusive or to limit the duties, functions and powers imposed on or vested in the Oregon Health Licensing Agency by other statutes.

SECTION 13. ORS 676.612 is amended to read:

676.612. (1) In the manner prescribed in ORS chapter 183 for contested cases and as specified in ORS 675.385, 678.780, 680.535, 687.445, 688.734, 688.836, 690.167, 690.407, 691.477, 694.147 and 700.111 **and section 11 of this 2013 Act**, the Oregon Health Licensing Agency may refuse to issue or renew, may suspend or revoke or may otherwise condition or limit a certificate, license, permit or registration to practice issued by the agency or may discipline or place on probation a holder

of a certificate, license, permit or registration for commission of the prohibited acts listed in subsection (2) of this section.

(2) A person subject to the authority of a board, council or program listed in ORS 676.606 commits a prohibited act if the person engages in:

(a) Fraud, misrepresentation, concealment of material facts or deception in applying for or obtaining an authorization to practice in this state, or in any written or oral communication to the agency concerning the issuance or retention of the authorization.

(b) Using, causing or promoting the use of any advertising matter, promotional literature, testimonial, guarantee, warranty, label, insignia or any other representation, however disseminated or published, that is false, misleading or deceptive.

(c) Making a representation that the certificate, license, permit or registration holder knew or should have known is false or misleading regarding skill or the efficacy or value of treatment or remedy administered by the holder.

(d) Practicing under a false, misleading or deceptive name, or impersonating another certificate, license, permit or registration holder.

(e) Permitting a person other than the certificate, license, permit or registration holder to use the certificate, license, permit or registration.

(f) Practicing with a physical or mental condition that presents an unreasonable risk of harm to the holder of a certificate, license, permit or registration or to the person or property of others in the course of performing the holder's duties.

(g) Practicing while under the influence of alcohol, controlled substances or other skill-impairing substances, or engaging in the illegal use of controlled substances or other skill-impairing substances so as to create a risk of harm to the person or property of others in the course of performing the duties of a holder of a certificate, license, permit or registration.

(h) Failing to properly and reasonably accept responsibility for the actions of employees.

(i) Employing, directly or indirectly, any suspended, uncertified, unlicensed or unregistered person to practice a regulated occupation or profession subject to the authority of the boards, councils and programs listed in ORS 676.606.

(j) Unprofessional conduct, negligence, incompetence, repeated violations or any departure from or failure to conform to standards of practice in performing services or practicing in a regulated occupation or profession subject to the authority of the boards, councils and programs listed under ORS 676.606.

(k) Conviction of any criminal offense, subject to ORS 670.280. A copy of the record of conviction, certified by the clerk of the court entering the conviction, is conclusive evidence of the conviction. A plea of no contest or an admission of guilt shall be considered a conviction for purposes of this paragraph.

(L) Failing to report any adverse action, as required by statute or rule, taken against the certificate, license, permit or registration holder by another regulatory jurisdiction or any peer review body, health care institution, professional association, governmental agency, law enforcement agency or court for acts or conduct similar to acts or conduct that would constitute grounds for disciplinary action as described in this section.

(m) Violation of a statute regulating an occupation or profession subject to the authority of the boards, councils and programs listed in ORS 676.606.

(n) Violation of any rule regulating an occupation or profession subject to the authority of the boards, councils and programs listed in ORS 676.606.

(o) Failing to cooperate with the agency in any investigation, inspection or request for information.

(p) Selling or fraudulently obtaining or furnishing any certificate, license, permit or registration to practice in a regulated occupation or profession subject to the authority of the boards, councils and programs listed in ORS 676.606, or aiding or abetting such an act.

(q) Selling or fraudulently obtaining or furnishing any record related to practice in a regulated occupation or profession subject to the authority of the boards, councils and programs listed in ORS 676.606, or aiding or abetting such an act.

(r) Failing to pay an outstanding civil penalty or fee that is due or failing to meet the terms of any order issued by the agency that has become final.

(3) For the purpose of requesting a state or nationwide criminal records check under ORS 181.534, the agency may require the fingerprints of a person who is:

(a) Applying for a certificate, license, permit or registration that is issued by the agency;

(b) Applying for renewal of a certificate, license, permit or registration that is issued by the agency; or

(c) Under investigation by the agency.

(4) If the agency places a holder of a certificate, license, permit or registration on probation under subsection (1) of this section, the agency, in consultation with the appropriate board, council or program, may determine and at any time modify the conditions of the probation.

(5) If a certificate, license, permit or registration is suspended, the holder may not practice during the term of suspension. Upon the expiration of the term of suspension, the certificate, license, permit or registration may be reinstated by the agency if the conditions of suspension no longer exist and the holder has satisfied all requirements in the relevant statutes or administrative rules for issuance, renewal or reinstatement.

SECTION 14. ORS 676.613 is amended to read:

676.613. (1) In addition to all other remedies, when it appears to the Oregon Health Licensing Agency that a person is engaged in, has engaged in or is about to engage in any act, practice or transaction that violates any provision of ORS 675.360 to 675.410, 676.617, 678.710 to 678.820, 680.500 to 680.565, 687.405 to 687.495, 688.701 to 688.734, 688.800 to 688.840, 690.005 to 690.235, 690.350 to 690.415, 691.405 to 691.485 or 694.015 to 694.185 **or section 3 of this 2013 Act** or ORS chapter 700, the agency may, through the Attorney General or the district attorney of the county in which the act, practice or transaction occurs or will occur, apply to the court for an injunction restraining the person from the act, practice or transaction.

(2) A court may issue an injunction under this section without proof of actual damages. An injunction issued under this section does not relieve a person from any other prosecution or enforcement action taken for violation of statutes listed in subsection (1) of this section.

SECTION 15. ORS 676.622 is amended to read:

676.622. (1) A transaction conducted through a state or local system or network that provides electronic access to the Oregon Health Licensing Agency information and services is exempt from any requirement under ORS 675.360 to 675.410, 676.605 to 676.625, 676.992, 680.500 to 680.565, 687.405 to 687.495, 688.701 to 688.734, 688.800 to 688.840, 690.005 to 690.235, 690.350 to 690.415, 691.405 to 691.485 and 694.015 to 694.185 **and section 3 of this 2013 Act** and ORS chapter 700, and rules adopted thereunder, requiring an original signature or the submission of handwritten materials.

(2) Electronic signatures subject to ORS 84.001 to 84.061 and facsimile signatures are acceptable and have the same force as original signatures.

SECTION 16. ORS 676.625 is amended to read:

676.625. (1) The Oregon Health Licensing Agency shall establish by rule and shall collect fees and charges to carry out the agency's responsibilities under ORS 676.605 to 676.625 and 676.992 and any responsibility imposed on the agency pertaining to the boards, councils and programs administered and regulated by the agency pursuant to ORS 676.606.

(2) The Oregon Health Licensing Agency Account is established in the General Fund of the State Treasury. The account shall consist of the moneys credited to the account by the Legislative Assembly. All moneys in the account are appropriated continuously to and shall be used by the Oregon Health Licensing Agency for payment of expenses of the agency in carrying out the duties, functions and obligations of the agency, and for payment of the expenses of the boards, councils and programs administered and regulated by the agency pursuant to ORS 676.606. The agency shall keep

a record of all moneys credited to the account and report the source from which the moneys are derived and the activity of each board, council or program that generated the moneys.

(3) Subject to prior approval of the Oregon Department of Administrative Services and a report to the Emergency Board prior to adopting fees and charges credited to the account, the fees and charges may not exceed the cost of administering the agency and the boards, councils and programs within the agency, as authorized by the Legislative Assembly within the agency's budget, as the budget may be modified by the Emergency Board.

(4) All moneys credited to the account pursuant to ORS 675.405, 676.617, 680.525, 687.435, 688.728, 688.834, 690.235, 690.415, 691.479, 694.185 and 700.080 **and section 3 of this 2013 Act**, and moneys credited to the account from other agency and program fees established by the agency by rule, are continuously appropriated to the agency for carrying out the duties, functions and powers of the agency under ORS 676.605 to 676.625 and 676.992 **and section 3 of this 2013 Act**.

(5) The moneys received from civil penalties assessed under ORS 676.992 shall be deposited and accounted for as are other moneys received by the agency and shall be for the administration and enforcement of the statutes governing the boards, councils and programs administered by the agency.

SECTION 17. ORS 676.992 is amended to read:

676.992. (1) Except as provided in subsection (3) of this section, and in addition to any other penalty or remedy provided by law, the Oregon Health Licensing Agency may impose a civil penalty not to exceed $5,000 for each violation of the following statutes and any rule adopted thereunder:

(a) ORS 688.701 to 688.734 (athletic training);

(b) ORS 690.005 to 690.235 (cosmetology);

(c) ORS 680.500 to 680.565 (denture technology);

(d) ORS 687.405 to 687.495 (direct entry midwifery);

(e) ORS 690.350 to 690.415 (tattooing, electrolysis, body piercing, dermal implanting and scarification);

(f) ORS 694.015 to 694.185 (dealing in hearing aids);

(g) ORS 688.800 to 688.840 (respiratory therapy and polysomnography);

(h) ORS chapter 700 (environmental sanitation);

(i) ORS 676.617 (single facility licensure);

(j) ORS 675.360 to 675.410 (sex offender treatment);

(k) ORS 678.710 to 678.820 (nursing home administrators);

(L) ORS 691.405 to 691.485 (dietitians); [*and*]

(m) ORS 676.612 (prohibited acts)**; and**

(n) Section 3 of this 2013 Act (applied behavior analysis).

(2) The agency may take any other disciplinary action that it finds proper, including but not limited to assessment of costs of disciplinary proceedings, not to exceed $5,000, for violation of any statute listed in subsection (1) of this section or any rule adopted under any statute listed in subsection (1) of this section.

(3) Subsection (1) of this section does not limit the amount of the civil penalty resulting from a violation of ORS 694.042.

(4) In imposing a civil penalty pursuant to this section, the agency shall consider the following factors:

(a) The immediacy and extent to which the violation threatens the public health or safety;

(b) Any prior violations of statutes, rules or orders;

(c) The history of the person incurring a penalty in taking all feasible steps to correct any violation; and

(d) Any other aggravating or mitigating factors.

(5) Civil penalties under this section shall be imposed as provided in ORS 183.745.

(6) The moneys received by the agency from civil penalties under this section shall be paid into the General Fund of the State Treasury and credited to the Oregon Health Licensing Agency Account established under ORS 676.625. Such moneys are continuously appropriated to the agency for

the administration and enforcement of the laws the agency is charged with administering and enforcing that govern the person against whom the penalty was imposed.

SECTION 18. Section 3 of this 2013 Act and the amendments to ORS 676.610, 676.612, 676.613, 676.622, 676.625 and 676.992 by sections 12 to 17 of this 2013 Act become operative November 1, 2013.

SECTION 19. Section 3 of this 2013 Act is amended to read:

Sec. 3. (1) There is created, within the Oregon Health Licensing Agency, the Behavior Analysis Regulatory Board consisting of seven members appointed by the Governor, including:

(a) Three members who are licensed by the board;

(b) One member who is a licensed psychiatrist or developmental pediatrician, with experience or training in treating autism spectrum disorder;

(c) One member who is a licensed psychologist registered with the board;

(d) One member who is a licensed speech-language pathologist registered with the board; and

(e) One member of the general public who does not have a financial interest in the provision of applied behavior analysis and does not have a ward or family member who has been diagnosed with autism spectrum disorder.

(2) Not more than one member of the Behavior Analysis Regulatory Board may be an employee of an insurer.

(3) The term of office of each member is four years, but a member serves at the pleasure of the Governor. Before the expiration of the term of a member, the Governor shall appoint a successor whose term begins on November 1 next following. A member is eligible for reappointment. If there is a vacancy for any cause, the Governor shall make an appointment to become immediately effective for the unexpired term.

(4) A member of the Behavior Analysis Regulatory Board is entitled to compensation and expenses as provided in ORS 292.495.

(5) The Behavior Analysis Regulatory Board shall select one of its members as chairperson and another as vice chairperson, for such terms and with duties and powers necessary for the performance of the functions of such offices as the board determines.

(6) A majority of the members of the Behavior Analysis Regulatory Board constitutes a quorum for the transaction of business.

(7) The Behavior Analysis Regulatory Board shall meet at least once every three months at a place, day and hour determined by the board. The board may also meet at other times and places specified by the call of the chairperson or of a majority of the members of the board.

(8) In accordance with ORS chapter 183, the Behavior Analysis Regulatory Board shall establish by rule criteria for the:

(a) Licensing of:

(A) Behavior analysts; and

(B) Assistant behavior analysts; and

(b) Registration of:

(A) Licensed health care professionals; and

(B) Behavior analysis interventionists.

(9) The criteria for the licensing of a behavior analyst must include, but are not limited to, the requirement that the applicant:

(a) Be certified by the Behavior Analyst Certification Board, Incorporated, as a Board Certified Behavior Analyst; and

(b) Have successfully completed a criminal records check.

(10) The criteria for the licensing of an assistant behavior analyst must include, but are not limited to, the requirement that the applicant:

(a) Be certified by the Behavior Analyst Certification Board, Incorporated, as a Board Certified Assistant Behavior Analyst;

(b) Be supervised by a behavior analyst who is licensed by the Behavior Analysis Regulatory Board; and

(c) Have successfully completed a criminal records check.

(11) The criteria for the registration of a behavior analysis interventionist must include, but are not limited to, the requirement that the applicant:

(a) Have completed coursework and training prescribed by the Behavior Analysis Regulatory Board by rule;

(b) Receive ongoing oversight by a licensed behavior analyst or a licensed assistant behavior analyst, or by another licensed health care professional approved by the board; and

(c) Have successfully completed a criminal records check.

(12) In accordance with applicable provisions of ORS chapter 183, the Behavior Analysis Regulatory Board shall adopt rules:

(a) Establishing standards and procedures for the licensing of behavior analysts and assistant behavior analysts and for the registration of licensed health care professionals and behavior analysis interventionists in accordance with this section;

(b) Establishing guidelines for the professional methods and procedures to be used by individuals licensed and registered under this section;

(c) Governing the examination of applicants for licenses and registrations under this section and the renewal, suspension and revocation of the licenses and registrations; and

(d) Establishing fees sufficient to cover the costs of administering the licensing and registration procedures under this section.

(13) The Behavior Analysis Regulatory Board shall issue a license to an applicant who:

(a) Files an application in the form prescribed by the board;

(b) Pays fees established by the board; and

(c) Demonstrates to the satisfaction of the board that the applicant meets the criteria adopted under this section.

(14) The Behavior Analysis Regulatory Board shall establish the procedures for the registration of licensed health care professionals and behavior analysis interventionists.

(15) All moneys received by the Behavior Analysis Regulatory Board under subsection (13) of this section shall be paid into the General Fund of the State Treasury and credited to the Oregon Health Licensing Agency Account.

[*(16) An individual who has not been licensed or registered by the Behavior Analysis Regulatory Board in accordance with criteria and standards adopted under this section may not claim reimbursement for services described in section 2 of this 2013 Act under a health benefit plan or under a self-insured health plan offered by the Public Employees' Benefit Board or the Oregon Educators Benefit Board.*]

SECTION 20. ORS 743A.190, as amended by section 7 of this 2013 Act, is amended to read:

743A.190. (1) A health benefit plan, as defined in ORS 743.730, must cover for a child enrolled in the plan who is under 18 years of age and who has been diagnosed with a pervasive developmental disorder all medical services, including rehabilitation services, that are medically necessary and are otherwise covered under the plan.

(2) The coverage required under subsection (1) of this section, including rehabilitation services, may be made subject to other provisions of the health benefit plan that apply to covered services, including but not limited to:

(a) Deductibles, copayments or coinsurance;

(b) Prior authorization or utilization review requirements; or

(c) Treatment limitations regarding the number of visits or the duration of treatment.

(3) As used in this section:

(a) "Medically necessary" means in accordance with the definition of medical necessity that is specified in the policy, certificate or contract for the health benefit plan and that applies uniformly to all covered services under the health benefit plan.

(b) "Pervasive developmental disorder" means a neurological condition that includes autism spectrum disorder, developmental delay, developmental disability or mental retardation.

(c) "Rehabilitation services" means physical therapy, occupational therapy or speech therapy services to restore or improve function.

(4) The provisions of ORS 743A.001 do not apply to this section.

(5) The definition of "pervasive developmental disorder" is not intended to apply to coverage required under ORS 743A.168 [*or section 2 of this 2013 Act*].

SECTION 21. ORS 750.055, as amended by section 3, chapter 21, Oregon Laws 2012, and section 8 of this 2013 Act, is amended to read:

750.055. (1) The following provisions of the Insurance Code apply to health care service contractors to the extent not inconsistent with the express provisions of ORS 750.005 to 750.095:

(a) ORS 705.137, 705.139, 731.004 to 731.150, 731.162, 731.216 to 731.362, 731.382, 731.385, 731.386, 731.390, 731.398 to 731.430, 731.428, 731.450, 731.454, 731.488, 731.504, 731.508, 731.509, 731.510, 731.511, 731.512, 731.574 to 731.620, 731.592, 731.594, 731.640 to 731.652, 731.730, 731.731, 731.735, 731.737, 731.750, 731.752, 731.804, 731.844 to 731.992, 731.870 and 743.061.

(b) ORS 732.215, 732.220, 732.230, 732.245, 732.250, 732.320, 732.325 and 732.517 to 732.592, not including ORS 732.582.

(c) ORS 733.010 to 733.050, 733.080, 733.140 to 733.170, 733.210, 733.510 to 733.680 and 733.695 to 733.780.

(d) ORS chapter 734.

(e) ORS 742.001 to 742.009, 742.013, 742.061, 742.065, 742.150 to 742.162, 742.400, 742.520 to 742.540, 743.010, 743.013, 743.018 to 743.030, 743.050, 743.100 to 743.109, 743.402, 743.472, 743.492, 743.495, 743.498, 743.499, 743.522, 743.523, 743.524, 743.526, 743.527, 743.528, 743.529, 743.549 to 743.552, 743.560, 743.600 to 743.610, 743.650 to 743.656, 743.764, 743.804, 743.807, 743.808, 743.814 to 743.839, 743.842, 743.845, 743.847, 743.854, 743.856, 743.857, 743.858, 743.859, 743.861, 743.862, 743.863, 743.864, 743.894, 743.911, 743.912, 743.913, 743.917, 743A.010, 743A.012, 743A.020, 743A.034, 743A.036, 743A.048, 743A.058, 743A.062, 743A.064, 743A.065, 743A.066, 743A.068, 743A.070, 743A.080, 743A.084, 743A.088, 743A.090, 743A.100, 743A.104, 743A.105, 743A.110, 743A.140, 743A.141, 743A.144, 743A.148, 743A.160, 743A.164, 743A.168, 743A.170, 743A.175, 743A.184, 743A.185, 743A.188, 743A.190 and 743A.192 and section 2, chapter 21, Oregon Laws 2012[*, and section 2 of this 2013 Act*].

(f) The provisions of ORS chapter 744 relating to the regulation of insurance producers.

(g) ORS 746.005 to 746.140, 746.160, 746.220 to 746.370, 746.600, 746.605, 746.607, 746.608, 746.610, 746.615, 746.625, 746.635, 746.650, 746.655, 746.660, 746.668, 746.670, 746.675, 746.680 and 746.690.

(h) ORS 743A.024, except in the case of group practice health maintenance organizations that are federally qualified pursuant to Title XIII of the Public Health Service Act unless the patient is referred by a physician associated with a group practice health maintenance organization.

(i) ORS 735.600 to 735.650.

(j) ORS 743.680 to 743.689.

(k) ORS 744.700 to 744.740.

(L) ORS 743.730 to 743.773.

(m) ORS 731.485, except in the case of a group practice health maintenance organization that is federally qualified pursuant to Title XIII of the Public Health Service Act and that wholly owns and operates an in-house drug outlet.

(2) For the purposes of this section, health care service contractors shall be deemed insurers.

(3) Any for-profit health care service contractor organized under the laws of any other state that is not governed by the insurance laws of the other state is subject to all requirements of ORS chapter 732.

(4) The Director of the Department of Consumer and Business Services may, after notice and hearing, adopt reasonable rules not inconsistent with this section and ORS 750.003, 750.005, 750.025 and 750.045 that are deemed necessary for the proper administration of these provisions.

SECTION 22. Section 2 of this 2013 Act is repealed January 2, 2022.

SECTION 23. Sections 2 and 10 of this 2013 Act and the amendments to ORS 743A.190 and 750.055 by sections 7 and 8 of this 2013 Act apply to health benefit plan policies and certificates:

(1) Offered by the Public Employees' Benefit Board or the Oregon Educators Benefit Board for coverage beginning on or after January 1, 2015; and

(2) Other than for plans offered by the Public Employees' Benefit Board or the Oregon Educators Benefit Board, for coverage beginning on or after January 1, 2016.

SECTION 24. The amendments to section 3 of this 2013 Act by section 19 of this 2013 Act and the amendments to ORS 743A.190 and 750.055 by sections 20 and 21 of this 2013 Act become operative January 2, 2022.

SECTION 25. This 2013 Act being necessary for the immediate preservation of the public peace, health and safety, an emergency is declared to exist, and this 2013 Act takes effect on its passage.

Passed by Senate June 29, 2013

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Robert Taylor, Secretary of Senate

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Peter Courtney, President of Senate

Passed by House July 1, 2013

.....
Tina Kotek, Speaker of House

Received by Governor:

.....M.,....., 2013

Approved:

.....M.,....., 2013

.....
John Kitzhaber, Governor

Filed in Office of Secretary of State:

.....M.,....., 2013

.....
Kate Brown, Secretary of State

Evidence Table Summary

Citations Provided During the Public Comment Process on the Evaluation of Evidence on Applied Behavior Analysis for Autism Spectrum Disorders

A total of 336 unduplicated citations were provided by public commenters. Each citation was evaluated to determine study design or article type and population characteristics (number and ages of included individuals), the abstract was retrieved and a link to the article provided when available. Below are the number of citations by study design:

Study Design	Frequency
Books	6
Case series	6
Case studies	5
Cohort studies	6
Controlled trials	7
Cost studies	3
Coverage policies	3
Government reports	4
Guideline/organizational statements	15
Legal decisions	15
Miscellaneous sources (not research-based)	6
Methods articles	9
Narrative reviews	14
Other observational studies	3
Quasi-experimental studies	3
Single subject research design (SSRD)	163
Systematic reviews & meta-analyses	17
Systematic review & meta-analyses of SSRD	11
Unable to determine/retrieve articles	40
Total	**336**

Miscellaneous sources=letter, newsletter, website, etc.

Below are the number of citations by age of the individual:

Age Categories	Frequency
12 and under	123
Above age 12 included	102
Unknown/Not applicable	111
Total	**336**

HERC Evidence Evaluation – Applied Behavior Analysis for Autism Spectrum Disorders
Disposition of Public Comments

Table of Contents

Commenters

Identification	Stakeholder
A	CCO Medical Directors, *Oregon*
B	Board Certified Behavior Analyst, *Portland, OR*
C	Trillium Family Services, *Portland, OR*
D	Care Manager (Pediatrics), *Clackamas, OR*
E	Parent of child with autism, *Tualatin, OR*
F	Residential Associate at adult care facility, *Portland, OR*
G	Developmental Pediatrician, Eugene Regional Service Center, *Eugene, OR*
H	Autism Society of Oregon, *Marylhurst, OR*
I	Family member of autistic person, *Portland, OR*
J	Family member of autistic person, *Portland, OR*
K	Family member of autistic person, *Portland, OR*
L	Family member of autistic person, *Portland, OR*
M	The Lovaas Institute for Early Intervention, *Minneapolis, MN* *Submitted by Eric V. Larsson, Ph.D., L.P., B.C.B.A.-D. – HERC-appointed Expert*
N	Licensed psychologist, Professor of Pediatrics, Oregon Health & Science University, *Portland, OR*
O	Licensed psychologist
P	Autism Speaks, *Boston, MA*
Q	A Hope for Autism Foundation, *Portland, OR*
R	Parent of child with autism, *Fort Collins, CO*
S	Parent of child with autism, *Portland, OR*
T	Family member of autistic person, *Portland, OR*

U	Parent of child with autism, *Salem, OR*
V	Association of Professional Behavior Analysts, *San Diego, CA* *Submitted by Gina Green, PhD, BCBA-D – HERC-invited Presenter*
W	Former manager of Wylie Center Autism Spectrum Intervention Program, *Riverside, California*
X	Family member of autistic person, *Bend, OR*
Y	Oregon Association for Behavior Analysis Board (ORABA) Board, *Bend, OR*
Z	Attorney, *Portland, OR*
AA	Family member of autistic person, *Portland, OR*
BB	Associate Professor and Program Director of School Psychology at the University of Oregon, *Eugene, OR*

HERC Evidence Evaluation – Applied Behavior Analysis for Autism Spectrum Disorders
Disposition of Public Comments

Public Comments Grouped by Commenter

Ident.	#	Comment	Disposition
A	1	• We are concerned about who makes the diagnosis of autism in order to qualify for ABA (schools versus medical professionals). Consider adding language requiring diagnosis to be based on a medical professional assessment using DSM V criteria. • There should be an upper limit on ABA. • Were electronic and high tech options considered in the evidence review?	The focus of this evidence evaluation is limited to treatment of ASD, specifically, ABA therapy. Language stating that ASD should be diagnosed by a qualified healthcare professional according to DSM-5 criteria is present in the summary conclusions of the evidence evaluation. Assuming commenter is referring to number of hours per week when suggesting an upper limit on ABA, the evidence included interventions that ranged from less than 2 to 40 hours per week, and no minimum or maximum has been determined to be required for efficacy. *For EbGS discussion.* Electronic options (including such treatments as Picture Exchange Communication System (PECS) are addressed in the source report, but are not included in this document because they are not considered ABA.
B	1	I am writing to encourage support for Applied Behavior Analysis (ABA) services for persons ages 12 and older with developmental disabilities. I am a Board Certified Behavior Analyst working with individuals 8 years and older in the Portland area. I work with this age range because there is a great need for behavioral support services for adolescents and adults with disabilities. I regularly receive calls from families whose adolescent or adult children are not getting their needs met through the existing educational and cultural systems.	Thank you for taking the time to comment.
B	2	Many existing services for persons with developmental disabilities focus on early intervention therapy, and specialized services for adolescents and adults can be hard to find. But adulthood is a hugely important time in a person's life that presents its own unique challenges. It is in adulthood that one is expected to have the most access and control over the variables that affect an individuals quality of life – friends, hobbies, jobs, and living space. Quality of life for adults with disabilities is below that of the non-disabled population. *"Of all working-age people with disabilities, only 21% say that they are employed, compared to 59% of people without disabilities – a gap of 38 percentage points. People with disabilities are still much more*	EbGS understands the difficulties experienced by the adult disabled population. Other services besides ABA are currently covered by the OHP for individuals with developmental disabilities (guideline note 75).

Ident.	#	Comment	Disposition
		likely to be living in poverty. People with disabilities are less likely than those without disabilities to socialize with friends, relatives or neighbors, once again suggesting that there are significant barriers to participation in leisure activities for this population. (National Organization on Disability, 2010)" National Organization on Disability. (2010). *2010 NOD/Harris survey of Americans with disabilities.* http://www.2010DisabilitySurveys.org/indexold.html	
B	3	ABA is a behavioral science that, by definition, focuses on problems of social importance. It has over 35-years of peer-reviewed research on improving the quality of life of individuals with and without disabilities. As more and more children age out of the education system, they will need supports to help them address the new challenges they will face as adults. To set an individual up for success, this type of transition planning has to start in adolescence. I have provided ABA services to several adolescents and adults. Here is a list of some of the skills they have needed help with: learning to navigate the trimet bus system independently, practicing social safety skills like what to do when lost, using money and making smart decisions about purchases, learning to identify abusive and unhealthy relationships, learning and practicing appropriate sexual behavior, and accessing community resources. My clients mastered these skills as a result of the ABA therapy provided. Some of these skills are not appropriate to teach before the age of 12, but are absolutely essential skills to have as an adult. While some individuals may learn these skills through school and through family, others need the help of a behavior specialist. Please support ABA for adolescents and adults with disabilities, and help those that need it most to get the skills they need for a higher quality of life. Thank you for your consideration.	EbGS appreciates the need for development of the skills described by the commenter, however, the effectiveness of ABA in developing those skills in children older than 12 is not supported by the evidence.
C	1	Please consider this message a strong recommendation from Trillium Family Services to include Applied Behavior Analysis (ABA) on the prioritized list of treatments in the Oregon Health Plan (OHP). Trillium is Oregon's largest provider of mental and behavioral health services for children and families. We have long contended that for many of those we serve – and countless others in our state – there exists a glaring and unacceptable lack of treatment for children on the autism spectrum. Three years ago, Trillium made a significant investment in exploring whether programs could be developed for this greatly underserved population. While we found the need in our communities and for our families was significant, we were forced to abandon the plan because no funding mechanisms existed through either the OHP or the commercial health insurance market to make the provision of these services feasible. During this process, however, we did conclude that ABA was a successful and effective evidence-based model in treating autistic children. More recently, we have developed a partnership with Footprints Behavioral Interventions to provide assessment and diagnostic services and deliver ABA therapy to children and young adults in Oregon	Thank you for sharing the background on your organization.

Ident.	#	Comment	Disposition
		ranging in age from 2 to 20 years old. We are nearing an agreement with Kaiser Permanente to fund these services, which would thus be available only to its members. We anticipate, however, that other commercial insurance companies in Oregon will begin providing similar coverage in the near future.	
C	2	We believe these services will result in higher functioning of clients within their families, schools and communities, greater independence and job readiness, and ultimately reduced health care costs. **These outcomes could be similarly achieved for those covered under the OHP.** As such, we support HERC's recommendation in favor of ABA coverage for younger children covered by the OHP; we believe the quality of evidence should be revised to Medium or High; and we believe there should be no minimum age for accessing ABA therapy.	The commenter does not provide additional evidence to support their contention that the quality of evidence for ABA is moderate to high, or that it is effective for children younger than two.
C	3	Further, we believe there is sufficient evidence to support the effectiveness of ABA for patients over the age of 12, and that coverage should be provided when medically necessary. A lack of treatment for those with severe symptoms may lead to self-injurious behaviors causing severe disabilities. **Please include Applied Behavior Analysis therapy on the prioritized list of treatments in the Oregon Health Plan.**	The commenter does not provide evidence for the effectiveness of ABA in children over age 12. The evidence reviewed by the EbGS does not support its use.
D	1	I am very excited to see you speak of ABA coverage! I am all in favor of autistic kids ages 2-12 getting ABA for a period of 6 months. Please keep me posted on any current happening.	Thank you for taking the time to comment.
E	1	I am writing to comment on access to ABA therapy as a prioritized treatment in the Oregon Health Plan. My child is severely impacted by Autism, and has been referred clinicians for ABA therapy on several different occasions. Because we cannot afford the therapy in addition to the other out of pocket costs associated with raising our child, and because our insurance provider has denied coverage on several different occasions, my son has not benefitted from ABA except through a program that is administered through the local education service district. Unfortunately, that service is only provided four days a week for an hour at a time. I'm having a hard time considering why Oregon would not want to cover ABA therapy for children immediately upon diagnosis. First and foremost, the people referring parents of autistic children to ABA therapy are professional doctors, clinicians, and specialists. Why question the experts? What do they have to gain by trying to enrich a childs life. Please approve coverage or access to ABA therapy within the OHP. There are plenty of children on the spectrum that do not have the resources available to get the help they need to foster a full and productive life from their children. I always believe that we can choose to pay now, and hope for the best results, or concede to the disease, and pay later housing and taking care of these children and young adults who did not have every opportunity available provided to them. Thank you for your time. If you have any questions please contact me.	Thank you for taking the time to comment. While experts are generally well-intentioned, there are many examples in the history of medicine of experts being proved wrong by a well-designed research study, hence the EbGS's focus on clinical research. The current evidence evaluation **does** recommend OHP coverage of ABA for children 2 to 12 with ASD.
F	1	I feel it worthwhile and necessary to provide feedback to the Oregon Health Evidence Review Commission on some of the issues concerning the recent publication of the draft of the Evaluation of	EbGS agrees that types and intensities of services vary significantly in the studies included in the source report,

Ident.	#	Comment	Disposition
		Evidence for Applied Behavior Analysis (ABA) treatment for Autism Spectrum Disorders (ASDs) which is to be made available to families and children diagnosed with Autism Spectrum Disorders in Oregon as a result of the passing of Senate Bill 365 earlier this year: Permit me, please, to address some concerns that arose for me in reading the ABA Evaluation of Evidence draft. I find that the review articles which are considered in the draft, particularly that by Warren and colleagues (2011), although well-intentioned to inform the public about the efficacy of ABA, suffer from a series of misunderstandings about the specific nature of ABA treatment and about how efficacy is demonstrated in determining the success of a behavioral treatment for a person. The authors don't seem to distinguish very well between types of ABA services provided to clients or between different intensities of services. They examine data for some interventions which may not be ABA-based, and have lumped ABA-based interventions of different intensities together under general labels, whereas the intensity and consistency of behavioral interventions that matches the nature of the problem, has proven to be one of the keys in producing good outcomes. Most seriously, though, these reviews base their conclusions about evidence strength on the standard of randomized controlled trial (RCT) studies. The RCT between-groups study design which is prioritized, looks at the differences in how a treatment affects the group of people to whom that treatment is provided, versus a group of individuals which receives no treatment (or a placebo). The design assumes that the purportedly random sample used for each group is representative of the entire population of interest. In presenting the summary of effects between these two groups, it does not take into close account individual differences and specific individuals in the treatment group which might have not benefited at all, or which have suffered adverse side-effects (which are then listed in a precautionary manner).	and that there is difficulty in pooling this data to draw meaningful conclusions. EbGS is unable to respond to commenter regarding which interventions they do not believe are ABA based, since those interventions are not specified. EbGS agrees with the commenter's statements regarding RCTs; while it is possible for a RCT to assess subgroups, none of the studies in the Warren report were powered to do so, and RCTs do not assess individuals.
F	2	In the single-subject study design used to evaluate individualized ABA treatment, no such assumptions exist. The behavior of an individual undergoing treatment is studied in detail, an intervention is developed based on prior scientific applications of behavioral sciences combined with evidence about this individual's strengths and abilities. Experimental control that shows effect for that individual is generally demonstrated by alternation of baseline/treatment conditions and **comparison of the results of the intervention to the earlier baseline data for that same individual**. This comparison is the demonstration of effect which does not require complex statistics to ascertain and yet is much more detailed. Moreover, the fact that experimental control is demonstrated makes this study design completely distinct from a simple case study, which is the accumulation of evidence without the benefit of experimental control. The strength of evidence criteria do not seem to make this vital distinction sufficiently strongly, which is particularly troubling because each successful ABA-based treatment study using single subject design (of which there are by now thousands), constitutes	EbGS acknowledges the distinction between single subject research design (SSRD) and case series. One of the primary problems of single subject design research is generalizability, or the likelihood that the results may apply to others. For an intervention to be considered evidence-based, Horner et al (2005) propose that the effect be replicated in at least 5 SSRD studies, that they be carried out by at least 3 different researchers in at least three different locations, and that those 5 studies include at least 20 subjects. The Warren report did include this study design as long as it included at least 10 subjects.

Ident.	#	Comment	Disposition
		scientifically valid systematic replication that adds support to ABA as an efficacious treatment method for ASD specifically because of the experimental control component.	
F	3	When taken together, the issues described above are likely to present a very misleading picture of the efficacy of ABA treatment for ASD and may put severe constraints on its availability to Oregonians who are likely to benefit. Given the varied nature of the manifestations of Autism Spectrum Disorders and relevant behavior problems and skill deficits likely to exist for any given diagnosed individual, it is imperative that a treatment be individualized if it is to be successful. The excessively narrow standard of evidence favoring between-groups design, is therefore very much misapplied, as it might be in other instances where highly individualized treatment were needed, such as essential surgeries. I urge this commission, prior to finalizing the Evaluation of Evidence for ABA, to seek the input of behavior analysis professionals with the understanding of the scientific implications of single-subject study design and group-based designs other than RCT for the purpose of treatment evaluation, who also possess the nuanced knowledge of the variety of ABA-based treatment procedures across diagnoses, populations and age groups, the criteria for the applications of these methods, and the evidence for their outcomes.	EbGS does not dispute the need to individualize treatment, and is aware that this needs to be done for many conditions. SSRD studies were included in the review when they met prespecified criteria. EbGS has sought input from experts, and has appointed three experts to assist the committee.
G	1	I am writing to comment on the recently released evaluation of evidence and draft recommendations on applied behavior analysis for children and adolescents with autism. I am a Developmental Pediatrician and Professor of Pediatrics at the Institute on Development and Disability (formerly the Child Development and Rehabilitation Center), Oregon Health & science University. I have more than 30 years' experience working with children with developmental disabilities including autism spectrum disorder and their families. I support the commission's recommendation in favor of ABA for children 2 -12 years of age, however, I strongly recommend the commission reconsider the failure to recommend ABA services for children less than 2 years of age or older than 12 years of age. There should be no minimum age for ABA. The absence of more robust research data on the effectiveness of ABA therapies for children less than 2 years of age primarily reflects the age at which an accurate autism diagnosis can be made for most children. Children who do receive a definitive diagnosis prior to 2 years of age should not be denied access to the most effective therapy, ABA. I have worked for many years on a multi-disciplinary diagnostic team at CDRC and am currently working to train and support medical-educational teams for autism identification in 4 local communities. In many instances, a definitive diagnosis of an autism spectrum disorder often can be made prior to 2 years of age. These children and their families deserve prompt access to treatment services.	Thank you for taking the time to comment. EbGS agrees that there is not robust research regarding ABA in children under 2, and acknowledges this is likely because of the difficulty in arriving at a definitive diagnosis before that age. Without a diagnosis, it is problematic to prescribe treatment. *For EbGS discussion*
G	2	There should be no limitation to ABA therapies for individuals over 12 years of age. The focus of ABA treatment for adolescents and young adults is often on challenging behaviors, for example, self-	See comment #F2 regarding SSRD. EbGS appreciates the desirability of treatment with behavioral therapies

Ident.	#	Comment	Disposition
		injurious behaviors. There is a wealth of information on the use of ABA techniques to successfully treat these issues. Data is primarily from well-designed single subject studies; however, this is supplemented with my clinical experience and that of any other health care professional who regularly treats older children and adolescents who have autism. Behavioral therapies are critical for these children. Best practice is to first provide behavioral interventions based on a careful functional analysis. In some cases this will obviate the need for psychotropic medications and their risk of potentially serious side effects. Further information on ABA and the utility of single subject research design is available through the National Autism Center and their National Standards project. I assume the commission is familiar with this resource.	before the use of psychotropic medications with significant risks, but does not believe there is sufficient evidence of effectiveness. *For EbGS discussion* Note to EbGS: The NAC is supported by the May Institute, a non-profit organization that provides services (all based on ABA) to individuals with ASD and other disabilities, as well as providing training in ABA. NAC is the May Institute's "center for the promotion of evidence-based practice." They completed the National Standards Project (NSP) in 2009, which is described as an evidence-based guideline of treatments for ASD.
H	1	Autism Society of Oregon (ASO) is the largest autism advocacy organization in Oregon, representing the over 9,000 individuals who have an autism spectrum disorder and their families. Annually, over 6,400 people are actively involved in ASO's programs. We have volunteers and activities in every region of Oregon. Our constituents range from very young children to senior citizens, and from mildly to very significantly impacted by autism. • ASO supports HERC's draft recommendation for coverage of ABA for young children, but disagrees that the strength of evidence in support of this recommendation is "low." • ASO disagrees with HERC's draft recommendation against ABA coverage for people over age 12. We are dismayed that HERC has not followed its own processes in reaching these draft conclusions and has not considered crucial information submitted to HERC by experts, including HERC's own ad-hoc experts. • ASO agrees with the rating of "Values and Preferences" as "low variability."	Thank you for your comments.
H	2	**1. <u>Following HERC's own published processes requires a finding that the strength of the evidence is "medium" or "high" for ABA for children ages 2 -12</u>** The Draft characterizes the quality of the evidence supporting ABA interventions for young children as "low." However, this determination contradicts HERC's published process. Much of the evidence summarized in the Draft qualifies as "high" and "medium" quality evidence. HERC's Biennial Report, presented as an official statement of HERC's process, states: "high quality sources are systematic reviews of prospective cohort studies and evidence-based guidelines from trusted sources, and "medium" quality evidence sources include guidelines issued by	EbGS believes there is a misunderstanding about the quality of an evidence source and the quality of the evidence on a particular topic. See comment #I1 for reference. Citation not provided for Maglione. If referring to the guideline published in Pediatrics, see comment #I6. If referring to the citation in the evidence evaluation, Maglione 2012 is a surveillance report for the AHRQ

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		professional societies and advocacy organizations, coverage decisions by private health plans, and well-conducted, peer-reviewed individual studies (experimental or observational). "High" quality evidence submitted includes Maglione, a systematic review of prospective cohort studies, which recommends coverage for ABA. Other examples of "high" or "medium" quality evidence under HERC's criteria include: 1. Voluntary coverage of ABA therapy in Oregon by Kaiser Permanente, 2. Several federal district and appellate courts have ordered coverage of ABA therapy, 3. Peer reviewed studies submitted by members of the public demonstrating the usefulness of ABA, and 4. Numerous professional societies and advocacy organizations have endorsed the use of ABA therapy for autism, including: **United States Surgeon General** (see attachment at page 164), **American Academy of Pediatrics**, **Autism Society of America** (our parent group), and **Autism Speaks.** Despite the abundance of "high" and "medium" quality evidence submitted, HERC characterized the evidence as "low" due to the relatively few randomized controlled trials. Nothing in HERC's stated process permits HERC to assess the strength of evidence based on the number of randomized controlled trials or the size of studies. Other evidence was presented to HERC through extensive written and verbal testimony from ad hoc experts and other witnesses. However, no mention of that evidence is made in the Draft.	Warren report. It was a systematic literature search, but not a systematic review (studies were identified, but not analyzed or synthesized), and makes no coverage recommendations. Legal decisions are not evidence sources. HERC is not qualified, nor have they been asked, to come to a conclusion about the merits of case law that may or may not pertain to OHP coverage. The US Surgeon General report is dated 1999 and cites only two studies supporting ABA. Individual studies may be high quality depending on how the study is conducted, but rarely does a single study represent high quality evidence, and commenter does not state which study they believe would qualify. With regard to medium quality evidence, the Biennial report states that they may be examined by the HERC. This does not mean they will be incorporated into guidance, especially if they conflict with a higher level of evidence. Regardless of the quality of the evidence source, the findings concerning the treatment being evaluated are unrelated. For example, the Warren report is a high quality systematic review of the evidence from a trusted source, which finds that there is low quality evidence of effectiveness for ABA in children 2-12, and insufficient evidence for children of other ages. It is the assessment of the Warren report that gave the evidence rating "low", and EbGS did not find additional evidence compelling enough to result in a deviation from this

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			assessment. The coverage guidance process, on which this evaluation of evidence is based, incorporates revisions based on public comment and submitted evidence. Revisions occur once the 30-day comment period ends. The evidence you reference is addressed in this document and the accompanying evidence table.
H	3	**2. Consideration of the evidence presented and HERC's own processes requires a recommendation of coverage for ABA for patients over age 12** The Draft mischaracterizes the evidence of the effectiveness of ABA for patients over age 12 as only one poorly designed case study, and disregarded the evidence presented by Drs. Hagopian, Green, and Riechow at the September meeting. When evidence from these experts is considered, there is sufficient evidence of the effectiveness of ABA to recommend coverage for patients over age 12.	Green provided citations for 2 guidelines and 17 review papers (see evidence table). Citations provided by Hagopian are included in the evidence table. Citations from Reichow include a 2012 Cochrane review of EIBI in children under age 6 with ASD. It included 1 RCT and 4 CCTs, all included in the Warren report, all using treatment as usual as the comparator. Youngest age at entry was 30 months. The review found evidence that EIBI is effective for some children. Authors graded the quality of the evidence as low, with a high risk of bias.
H	4	However, even if the evidence were not sufficient, the Guidance Development Framework approved by HERC requires a recommendation of coverage because denying ABA to patients results in serious disability. The testimony and video from the parents of the young woman who required around-the-clock 2:1 care due to her self-injuring behavior showed clearly that she experienced a serious disability and that focused ABA therapy relieved this behavior. Dr. Hagopian also testified about the use of ABA in older patients to resolve seriously disabling behaviors. Had HERC considered this evidence and applied it to the Framework, it would have lead to a recommendation of coverage for older patients.	The Guidance Development Framework does not "require" any particular decision. It serves only as a general guide, and is accompanied by the following description of its intended use when initially approved in January 2013: "This framework was developed to assist with the decision making process for the Oregon policy-making body, the HERC and its subcommittees. It is a general guide, and must be used in the context of clinical judgment. It is not possible to include all possible scenarios and factors that may influence a policy decision in a graphic format. While this framework

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			provides a general structure, factors that may influence decisions that are not captured on the framework include but are not limited to the following: • Estimate of the level of risk associated with the treatment, or any alternatives; • Which alternatives the treatment should most appropriately be compared to; • Whether there is a discrete and clear diagnosis; • The definition of clinical significance for a particular treatment, and the expected margin of benefit compared to alternatives; • The relative balance of benefit compared to harm; • The degree of benefit compared to cost; e.g., if the benefit is small and the cost is large, the committee may make a decision different than the algorithm suggests; • Specific indications and contraindications that may determine appropriateness; • Expected values and preferences of patients." This language has been added to the evidence evaluation document for clarity. The Decision Framework is intended to address the evidence supporting a treatment. On the decision framework, the evidence pertaining to ABA in individuals older than 12 is insufficient, treatment risk compared to no treatment is similar or less, treatment is prevalent, and a clinical research study is reasonable (as we have many examples in the literature). Expert opinion and personal testimony are not evidence, Expert testimony serves to provide clinical context for decision-making and may guide decision-making where evidence is mixed or insufficient. Patient testimony is

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			considered as a part of patient values and preferences in the GRADE methodology. *For EbGS discussion*
H	5	3. ASO's members are strongly in favor of ABA therapy. The rating of "Values and Preferences" as "low variability" is consistent with the evidence of parents' strong preference for ABA therapy. Parents in Oregon have fought hard for ABA coverage for many years in the legislature and the courts. Families with commercial insurance have pursued and won, and are currently pursuing, federal court cases to obtain ABA. Other families obtained ABA therapy through administrative appeals after denials by their insurance companies. Still other families persuaded their self-insured employers, such as Intel, to voluntarily cover ABA therapy. I am personally aware of the strong preference for ABA therapy among families. My two sons are autistic and enrolled in OHP Plus. Since ABA is not currently covered, we have paid thousands of dollars out of pocket for ABA therapy for our more significantly impacted son. We spent hours training with his therapists, had therapists in our home 25 hours per week year-round, and worked extensively with him during non-therapy hours. We did this because ABA is effective for him in increasing his independence and communication, and in reducing the symptoms of autism. To pay for ABA we sold our home and depleted our savings and retirement funds. However, we had to choose which of our children received ABA because we didn't have the resources to provide ABA therapy to both. Many families also desperately want ABA therapy for their children but can not afford it. The initial determination of "moderate variability" interest was surprising and upsetting as it was admittedly made without any evidence and only by completely ignoring the long-standing fight by parents to get ABA therapy for their children. We agree with the change to "low variability." **References:** 1. Prioritization of Health Services: A Report to the Governor and 77th Oregon Legislative Assembly (2013) 2. Mental Health: A Report of the Surgeon General (1999). Attached are the Title Page through Table of Contents and pages 151-174. See page 165.	Thank you for your comment.
I	1	Public Comment: HERC's 2013-2015 biennial "PRIORITIZATION OF HEALTH SERVICES: A Report to the Governor and the 77th Oregon Legislative Assembly" provides the following definition of "High Quality" evidence (Chapter 1, page 21): "The following types of evidence are considered *high quality*:	Thank you for providing this reference. This document further states: "Clinical judgment will still need to be used by the Commission to determine whether the available evidence is sufficient and compelling enough to affect prioritization decisions." A high quality source may

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		• Systematic reviews of randomized controlled trials • Systematic reviews of prospective cohort studies • Evidence-based guidelines from trusted sources"	still result in low quality evidence. It means the methodology used to review evidence involved a rigorous approach, but the underlying evidence was still of low quality. See comment #H3.
I	2	Evidence-based guidelines from sources from trusted sources: Warren, *Comparative Effectiveness Review # 26: Therapies for Children With Autism Spectrum Disorders*, AHRQ Age Range reviewed: 2 to 12 *Key findings:* • "Evidence supports early intensive behavioral and developmental intervention, including the University of California, Los Angeles (UCLA)/Lovaas model and Early Start Denver Model (ESDM) for improving cognitive performance, language skills, and adaptive behavior in some groups of children." (p. vi) • "Within this category, studies of UCLA/Lovaas-based interventions report greater improvements in cognitive performance, language skills, and adaptive behavior skills than broadly defined eclectic treatments available in the community. However, strength of evidence is currently low." (page ES-7)	Warren is a systematic review, not a guideline. However, this report does serve as the evidence base for recommending coverage for children ages 2 to 12, and assesses the strength of the evidence for ABA to be low. EbGS agrees with the findings for ages 2-12 and agrees the strength of evidence is low.
I	3	New Zealand Guidelines Group, Guideline Supplementary Paper -- New Zealand Autism Spectrum Disorder Guideline Supplementary Evidence on Applied Behaviour Analysis Age Range reviewed: 0 to 14 *Key Findings:* • "Interventions and strategies based on applied behaviour analysis (ABA) principles should be considered for all children with ASD." (Grade A) [The recommendation is supported by GOOD evidence (where there is a number of studies that are valid, applicable and clinically relevant)] • "Early intensive behavioural intervention (EIBI) should be considered as a treatment of value for young children with ASD to improve outcomes such as cognitive ability, language skills, and adaptive behaviour." (Grade B) [The recommendation is supported by FAIR evidence (based on studies that are mostly valid, but there are some concerns about the volume, consistency, applicability and/or clinical relevance of the evidence that may cause some uncertainty, but are not likely to be overturned by other evidence).]	Thank you for providing this reference. This guideline, initially published in 2008 and updated in 2010, was rated fair quality in the WA HTA report. NZ guideline also states, "There is a lack of knowledge about the suitability of ABA for persons with an Asperger Syndrome diagnosis, and for participants aged 15 years or above" *For EbGS discussion regarding extending age to 14*
I	4	Systematic Reviews of randomized controlled trials and prospective cohort studies: IMPAQ International, LLC, *Final Report on Environmental Scan, Autism Spectrum Disorders (ASDs) Services Project*, for Center for Medicaid and Medicare Services	This report grouped interventions into 3 categories: evidence-based, emerging or unestablished. The one

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		Age Range reviewed: 0 to 21 (children and transitioning youth) *Key Findings:* • Identified 15 ABA, Developmental, and other behavioral interventions as "Established" for children • Identified 1 ABA (antecedent) intervention as "Established" for transitioning youth	intervention considered established for transitioning youth (ages 17-21) was the antecedent package (interventions that "focus on modifying the conditions or events that usually precede the occurrence of targeted behavior(s), with the objective of increasing the success of a preferred behavior"). The authors state that their assessment was based on review of 2 studies, but only one citation is provided, which was for an interrupted time series study with a sample size of 3.
I	5	Clinical Practice Guideline Report of the Guideline Recommendations Autism / Pervasive Developmental Disorders Assessment and Intervention for Young Children (Age 0-3 Years), New York State Department of Health Early Intervention Program Age Range: 0 to 3 *Key Findings:* • "It is recommended that principles of applied behavior analysis (ABA) and behavior intervention strategies be included as an important element of any intervention program for young children with autism. [A]" • "It is recommended that intensive behavioral programs include as a minimum approximately 20 hours per week of individualized behavioral intervention using applied behavioral analysis techniques (not including time spent by parents). [A]"	This guideline was sponsored by NY DOH, but was created by a panel of parents and professionals. It is not dated, but appears to have been created in 2005. It states that it is not intended to be a policy document or a required standard of practice for NY DOH. 19 articles cited as SSRD are listed as evidence, as well as other studies that were included in Warren 2011 which did not include children <2. Full text of guideline not available without purchase.
I	6	Maglione, M.A. et al, "Nonmedical Interventions for Children With ASD: Recommended Guidelines and Further Research Needs," *Pediatrics*, 2012 Age Range: 3 to 17 *Key Findings:* • Developed consensus guidelines on nonmedical interventions that address cognitive function and core deficits in children with autism • Guidelines were developed by a Technical Expert Panel (TEP) based on a systematic overview of research findings • "The TEP agreed that children with ASD should have access to at least 25 hours per week of comprehensive intervention to address social communication, language, play skills, and maladaptive behavior. They agreed that applied behavioral analysis … have shown efficacy." • Strength of Evidence for ABA was "Moderate"	AHRQ and GRADE methodology utilized. Excluded SSRD studies. Authors state the following: "In addition, the criteria for including a study in our review were more rigorous than in previous reviews that included single subject research designs. Such reviews have been used to create "evidence-based" standards that in fact do not reflect accepted principles of evidence-based practice. Still, our own guideline statements are based largely on expert opinion, with the systematic review as a starting point." With regard to individuals older than 12, the guideline states:

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			"The comprehensive interventions we identified were targeted mainly to young children. These types of behavioral interventions, parent training programs, environmental support, and developmental interventions rarely studied adolescents and thus provided limited information on the characteristics of effective programs for adolescents or adults." The SR supporting the guideline does not include specific ages, but only refers to age as child or adolescent. Authors were able to evaluate the effect of age only for social skills interventions, and age was not identified for any of the other interventions. Of the studies of social skills interventions, 3 included both children and adolescents, 4 included children only and 3 included adolescents only. Of those that included only adolescents, there was statistically significant benefit found in 1 of the 3 included studies. While the results of the other 2 did not reach statistical significance, pooling the 3 studies did result in a statistically significant result. Evidence was not reported separately by age for any other type of intervention. *For EbGS discussion regarding extending age to 17*
I	7	Guidelines issued by government agencies: Numerous state and federal government agencies have issued evidence-based guidelines on ABA. While they are not on HERC's list of "trusted sources," they should be given stronger weight than "Guidelines issued by professional societies and advocacy organizations" which meet HERC's definition of "Medium Quality" evidence. This is a review of one particularly relevant recommendation from the Interagency Autism Coordinating Committee, signed by the Director of the National Institute for Mental Health, on coverage of ABA in Medicaid. Letter from Interagency Autism Coordinating Committee to DSHS Secretary Sebelius Age Range reviewed: Not specified	These key findings do not appear to conflict with the current recommendations in the evidence evaluation.

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		Key Findings: • "While intensive behavioral interventions are expensive, they are effective and recent data support that they are cost-effective, mitigating these long-term costs of disability. Research tells us that treatment works. As a result, the American Academy of Pediatrics and the United States Surgeon General have endorsed these interventions." • "A Federal minimum standard of autism coverage should be set for all health plans offered in the individual and small group markets. Minimum coverage should include evidence-based early intervention—including but not limited to ABA—for children with ASD, at a level of intensity indicated by the evidence."	
J	1	HERC's 2013-2015 biennial "PRIORITIZATION OF HEALTH SERVICES: A Report to the Governor and the 77th Oregon Legislative Assembly" provides the following definition of "Medium Quality" evidence (Chapter 1, page 22): "The following sources are considered medium quality and are often examined by the HERC. * Guidelines issued by professional societies and advocacy organizations (e.g. American Heart Association) * Coverage decisions by private health plans (e.g. Aetna) * Well-conducted, peer-reviewed individual studies (experimental or observational)" The CD-ROM submitted contained numerous pieces of evidence that meet this definition of "Medium Quality" evidence. This comment focuses on coverage decisions made for health plans – including private plans, government-administered health plans, and Medicaid programs in other states – by courts of law, which have consistently found that ABA therapy is evidence-based and that decisions to exclude it were arbitrary, capricious, and contrary to law. Medicaid:	The HERC may examine these additional sources, but generally will not make recommendations based on them, especially if they conflict with higher quality evidence. See comment #H3.
J	2	We have described two specific court orders from Florida and Ohio. The CD-ROM also contains Medicaid opinions and settlement agreements from Louisiana, Michigan, and Washington. **Florida – Garrido v Dudek** Age Range: 0 to 21 Key findings: * "17. ABA is "medically necessary" and is not "experimental" as defined under Florida administrative law and federal law." * "19. ABA is indisputably considered by the medical community to be the standard means of treatment for children with ASD."	Legal decisions are not considered evidence; they are the result of a legal process, and have been known to mandate coverage for treatments later shown to be ineffective or harmful (e.g., bone marrow transplant in breast cancer) and are related to the facts or contexts of a particular case.

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		* "20. ABA is indisputably considered proven and effective by the medical community." * "21. There is a plethora of medical and scientific literature including peer-reviewed meta-analyses, studies, and articles conclusively showing that ABA is a proven and effective treatment to prevent disability and restore developmental skills to children with autism and ASD." * "25. It is unreasonable to solely consider large-scale randomized controlled trials when evaluating ABA's efficacy because these trials are not appropriate or feasible for the vast majority of ABA research involving children with ASD, and it is unethical to have a control group, i.e., a group of children not getting ABA therapy." * "28. The Defendant violated EPSDT provisions of the Medicaid Act by excluding coverage of Applied Behavior Analysis (ABA) for Medicaid-eligible recipients under 21…." **Ohio – PLEASE v Jones Kelley** Age Range: 0 to 21 Key findings: * "ABA therapy, when recommended by a licensed practitioner of the healing arts, is a medically necessary service which provides the maximum reduction of a mental or physical disability." * "For an autistic child, 'the best treatment plan will include ABA [applied behavioral analysis], the only treatment approach confirmed as effective by a comprehensive evaluation of all proposed therapies in a well known government sponsored review process.'" * "ABA therapy is 'a highly effective form of behavioral treatment in virtually all cases'" * "If the Plaintiff children are no longer able to receive the medically recommended 35-40 hours of ABA therapy per week, there is sufficient evidence that the children will experience regression."	
J	3	**Private and Government Employer Health Plans:** **PacificSource – McHenry v PacificSource** Key Findings: * "ABA therapy is firmly supported by decades of research and application and is a well-established treatment modality of autism and other PDDs. It is not an experimental or investigational procedure" (document 59, 1/5/10, page 19) **Tricare – Berge v United States of America** Key Findings: * "… the assessments cited by the Agency suggest that behavioral modification therapy is the closest intervention medical professionals have identified as the standard means for treating autism. … (ABA is "the dominant and preferred treatment modality" for autism). Therefore, this Court is left to wonder what forms of autism treatment would satisfy the Agency's regulatory requirement of being	See comment #J2.

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		proven when the very sources the Agency relies upon to declare ABA therapy unproven cannot identify one form of treatment that is more effective than ABA therapy. Since the Agency has failed to articulate a reasoned explanation for its determination that ABA therapy is unproven, particularly in light of evidence before it suggesting the contrary, the Court must conclude that the Agency's determination is arbitrary and capricious." * "Agency's denial of ABA therapy coverage under the Basic Program is arbitrary and capricious" **Blue Cross Blue Shield – Potter, Boyer v Blue Cross Blue Shield of Michigan** Key Findings: * "Given that the studies in the record almost uniformly conclude that ABA is effective, and make almost no distinction between types of autism spectrum disorder, the Court finds that the 2010 medical policy's statement that ABA's effectiveness 'in the treatment of certain types of autism spectrum disorders has not been established' is not supported by the record." * "The medical policy also does not describe why 'several studies' providing relatively long follow-up data does not constitute 'enough long-term studies.' To the extent BCBS relies on the numerical insufficiency of the long-term studies of ABA therapy, its policy is internally inconsistent and unsupported; reliance on it to determine benefits would be arbitrary and capricious." * "… with respect to randomization, the studies cited in the medical policy state that randomized studies of ABA therapy are unavailable for ethical and practical reasons, and the single randomized study cited in the policy confirmed ABA's efficacy." * "It is further ordered that Defendant's characterization and exclusion of ABA therapy as experimental or investigative, as applied to the claims of the class members, was, and is, arbitrary and capricious."	
K	1	HERC's 2013-2015 biennial "PRIORITIZATION OF HEALTH SERVICES: A Report to the Governor and the 77th Oregon Legislative Assembly" provides the following definition of "Medium Quality" evidence (Chapter 1, page 22). "The following services are considered medium quality and are often examined by the HERC: Guidelines issued by professional societies and advocacy organizations (e.g., American Heart Association) Coverage decisions by private health plans (e.g., Aetna) Well-conducted, peer-reviewed individual studies (experimental or observational)" The CD-Rom submitted contained numerous pieces of evidence that meet this definition of "Medium Quality" evidence. This comment reviews several guidelines for coverage of ABA issued by professional and advocacy organizations.	The HERC may examine these additional sources, but generally will not make recommendations based on them, especially if they conflict with higher quality evidence. SSRD studies were included in the source reports when they met specific inclusion criteria. These findings do not appear to conflict with the current recommendations in the evidence evaluation.

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		Guidelines issued by professional societies and advocacy organizations: American Academy of Child and Adolescent Psychiatry Key findings: "Early and sustained intervention appears to b particularly important, regardless of the particular philosophy of the program, so long as a high degree of structure is provided. Such programs have typically incorporated behavior modification procedures and applied behavior analysis. These methods build on a large body of research on the application of learning principles to the education of children with autism and related conditions. Procedures that strengthen desired behaviors and/or decrease undesired maladaptive behaviors are utilized in the context of a careful and individualized plan of intervention based on observation of the individual. It is clear that behavioral intervention can significantly facilitate acquisition of language, social, and other skills, and that behavioral improvement is helpful in reducing levels of parental stress." **National Autism Center:** Key findings: Developed by an expert panel: "based on a thorough review of the educational and behavioral treatment literature that targets core characteristics and associated symptoms of ASD that was published between 1957 and the fall of 2007" Identified "11 Established Treatments: treatments that produce beneficial outcomes and are known to be effective for individuals on the autism spectrum. The overwhelming majority of these interventions were developed in the behavioral literature (e.g., applied behavior analysis, behavioral psychology, and positive behavior support)." **American Academy of Pediatrics** Key findings: "The effectiveness of ABA-based intervention in ASDs has been well documented through 5 decades of research by using single-subject methodology and in controlled studies of comprehensive early behavioral intervention programs in university and community settings. Children who receive early intensive behavioral treatment have been shown to make substantive, sustained gains in IQ, language, academic performance, and adaptive behavior as well as some measures of social behavior, and their outcome have been significantly better than those of children in control groups."	
L	1	This summarizes my feedback on the draft report on ABA as a treatment for autism. In general: • I support the strong recommendation in favor of ABA coverage for younger children	See comments #G1, #H2 and #H3.

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		o The quality of evidence is – by HERC standards – Medium or High, not low o There should be no minimum age for ABA – children under 2 should be given access to ABA upon diagnosis • Patients over the age of 12 should be given coverage for ABA when medically necessary o There is sufficient evidence to support the effectiveness of ABA for older patients o For some patients with severe symptoms, such as self-injurious behaviors, a failure to treat can result in severe disability. By HERC's process, this requires a "strong" recommendation in favor of coverage even if evidence is insufficient.	
L	2	Background – Page 1: The first paragraph includes the sentence "The bill also directs insurers to cover ABA therapy up to a maximum of 25 hours per week for children who initially seek care before age nine, and allows continued coverage until age 18." This isn't an accurate description of SB365. It should be replaced with the following: "The new law also establishes requirements for state-regulated health plans to approve and manage autism treatment, including ABA and any other medical or mental health services identified in an individualized treatment plan. The law applies to patients who begin treatment before age 9, covering up to 25 hours of ABA per week, and continuing for as long as medically necessary regardless of age. Existing Oregon laws requiring coverage of autism treatment (ORS 743A.168 and 743A.190) continue to apply to older patients and those seeking more than 25 hours of ABA per week." This section should also include the definition of Applied Behavior Analysis from SB365 Section 2(1).	Evidence evaluation background section changed to reflect this verbiage, definition of ABA added. ORS743A.190 and ORS743A.168 do not apply to Medicaid.
L	3	Evidence Sources and Summary of Evidence – pages 2 to 15: All of the sources listed are Comparative Effectiveness Research. As required by ORS 414.701, it must be expanded to include other sources. Please refer to the CD-ROM I submitted, and the attached list of references, for other High and Medium Quality sources.	See evidence table. Total of 336 unduplicated citations provided by all commenters. Detailed review limited to experimental designs that included individuals over age 12. Random sample of SSRD studies reviewed, as well as all SR or MA of SSRD studies. EbGS utilizes the GRADE methodology for making recommendations, which includes incorporation of values and preferences. The EbGS also considered testimony from three appointed experts on ABA, and is considering additional public testimony during this 30

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			day public comment period. In addition, the material relied upon in the evaluation of evidence is not solely or even substantially comparative effectiveness research. The Warren report, while referred to as a comparative effectiveness review, also included at least 11 case series or chart reviews, and the additional information from the Maglione report included 4 case series. Many of the cohort studies and controlled trials compared ABA to waitlist, not another intervention. See comment #X2
L	4	<u>GRADE Informed Framework – page 16:</u> *ABA for adolescents and adults*: We have provided additional evidence and testimony, including sources that meet HERC's definition of "Medium" and "High" quality, to support coverage for patients over the age of 12. The "insufficient" quality of evidence rating should be upgraded to Medium or High. *Quality of Evidence:* There is a footnote reading: "The Quality of Evidence rating was assigned by the primary evidence source. The HERC has made its own assessment of the quality of the evidence after the review of the studies contained within the AHRQ surveillance report." This is inconsistent with the definition of High, Medium and Low quality evidence that we were provided by HERC's attorney, as documented in HERC's 2013-2015 report to the Governor and Legislature, Chapter 1: "The following types of evidence are considered high quality: • Systematic reviews of randomized controlled trials • Systematic reviews of prospective cohort studies • Evidence-based guidelines from trusted sources" … The following sources are considered medium quality and are often examined by the HERC.	See comment #H2. HERC does not have a specifically appointed attorney. The material provided to this commenter was from the OHA communications office. Although there appears to be a misunderstanding about the quality of an evidence source and the quality of evidence that supports (or does not support) an intervention, the Warren report pertains only to children ages 2 to 12, not adolescents and adults as suggested in this comment.

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		• Guidelines issued by professional societies and advocacy organizations (e.g. American Heart Association) • Coverage decisions by private health plans (e.g. Aetna) • Well-conducted, peer-reviewed individual studies (experimental or observational); there is ample Medium and High quality evidence for all Indications listed." By HERC's definition, an Evidence-based guideline from a trusted source – such as AHRQ CER26 by Warren (2011) or Maglioni (2012) is by definition "High Quality" evidence. Since there is High Quality evidence supporting ABA as effective, the "Quality of Evidence" should be rated "High" rather than "Low."	
L	5	Summary Conclusions – page 17: *For patients ages 2-12:* There is no evidence that ABA would be ineffective or harmful for patients under the age of 2. There should be no minimum age for treatment – patients should be provided coverage for ABA therapy upon diagnosis.	The Warren report only addressed children from 2 to 12. While it is correct that there is no evidence that ABA is ineffective or harmful, stewardship of scarce resources guides the HERC work of limiting coverage to those treatments that have evidence of effectiveness. According to one of the appointed experts, "The age at which treatment should be started is also uncertain. … We do not have strong evidence that starting a treatment at 24 months, as opposed to 36 months, will produce more gains, and if yes which ones." *For EbGS consideration*
L	6	As discussed in the 11/7/2013 EbGS meeting, the GRADE framework on page 16 references "EIBI for children aged 2 to 12 years at initiation" – indicating that the recommendation was for patients who start ABA by age 12 but could then continue beyond that age. This should be reflected in the Summary Conclusion.	*For EbGS consideration*
L	7	*Parent / Caregiver involvement:* I support parent involvement and training. However, the SB365 definition of ABA is based on professionally administered therapy. All patients should have access to professionally administered treatment; no patient should be denied coverage if parents are unable to participate.	The summary conclusions state that parent/caregiver involvement is recommended; it does not say required. Expert testimony reinforced the importance of parent involvement, and some studies included in the evidence evaluation addressed parent-administered therapy.
L	8	*For patients over the age of 12:* While there has been more research into ABA for younger children, HERC's report has not	The quoted statement has been deleted from the summary conclusions.

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		documented any research showing "that ABA is most effective when administered at younger ages….." There is ample Medium and High quality evidence for the effectiveness of ABA with patients over the age of 12, as documented in the CD-ROM and attached reference list. Even if HERC were to conclude that evidence was "insufficient," a failure to treat ABA in older patients can cause very severe disability, making a clinical trial unreasonable per HERC's criteria. Therefore, HERC process calls for a strong recommendation in favor of coverage for older patients.	See evidence table with regard to CD-ROM. *For EbGS discussion regarding reasonableness of a clinical trial.*
L	9	<u>Appendix B – Potentially Applicable Codes – page 21:</u> In addition to the codes you have listed, HERC should consider the following: • Kaiser uses codes G0176 and G0177 • Many insurers use codes 90806 and 90808	Thank you for these suggestions. Specific coding is beyond the scope of this guidance, but this information may be useful to others. Codes added. • G0176 – Activity therapy, such as music, dance, art or play not for recreation, related to the care and treatment of patient's disabling mental health problems (45 min or more) • G0177 – Training and educational services related to the care and treatment of patient's disabling mental health problems (45 min or more) • 90806 – discontinued code; bill 90834 – psychotherapy, 45 min • 90808 – discontinued code, bill 90837 – psychotherapy, 60 min *For EbGS discussion*
L	10	<u>Appendix C – HERC Guidance Development Framework – pages 22 and 23:</u> For the assessment on page 23 for older patients, we disagree: • Level of Evidence should be considered Sufficient. This would then follow the same path as for younger patients on page 12, with a "Strong Recommend" result. • Even if HERC concludes that evidence is Insufficient, a clinical research study is not reasonable, since failure to perform ABA for some severely impacted patients is likely to result in serious disability or even death, in the case of self-injurious behavior. This also produces a "Strong Recommend" result.	The Guidance Development Framework is not directive, but serves only as a framework for consideration; see comment #H3. If there is insufficient evidence to support an intervention, even if the underlying disease is very severe, it is unknown whether or not that intervention would be helpful, and thus does not compel support. The example of bone marrow transplant for breast cancer is illustrative.

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			For EbGS discussion regarding reasonableness of a clinical trial.
M	1	My understanding is that the committee has decided to accept the evidence for treatment of children up to the age of 12 as sufficient to make a recommendation, and as I have previously submitted sufficient supporting evidence for that recommendation, I will focus in these comments on the evidence for treatment of older children.	Thank you for your comment.
M	2	**Regarding publication bias.** This consideration has to be considered a moot point, because all peer-reviewed evidence of any kind is subject to the same risks. This is why the AAP (2013), the SAMHSA (2007), and others recommend that considerations of evidence be based also upon published expert reviews, which can take into account the relative risks and plausibility of findings. On the issue of the exclusive reliance upon RCTs, these are emphatically not the sole form of science, and in actuality, the field of ABA was developed in reaction to their shortcomings. The real knowledge of science comes from laboratory research where we directly manipulate the biological process and observe the results – in the single organism. In the case of ABA, a publication of this form of evidence will include both the failures and the successes, because due to its laboratory nature, the study directly compares a failed treatment with a successful form of treatment in the same child. The technical manipulation of parameters, with replications of the effect across repeated measures, makes it entirely unlikely that some kind of spurious conclusion is being published. This model of experimentally controlled research within single subjects is also best suited to advance our understanding of autism, because the presenting problems are so heterogeneous. It is daunting to compile a large group of participants and compare them with matched controls, when the dependent measures are of such widely varying types. The heterogeneity is the focus of the large scale studies of older children's treatment. Approximately half of the studies are "functional analyses." These are studies which explicitly compare several possible treatments to weed out the ineffective from the effective treatments. Such purposeful experimental manipulations and reports of failures and successes lessen the likelihood of publication bias.	See evidence table. Publication bias occurs when "negative" studies are not published. While it is true that all evidence may be subject to publication bias, statistical tests can be done to assess the degree to which that exists in clinical research. EbGS is unaware of statistical tools to assess this in SSRD. The primary sources for this evidence evaluation do not rely exclusively on RCTs, and include observational studies as well as SSRD when those studies meet specific criteria.
M	3	**What is the evidence for treatment of older age children?** In the research listed here, over 2,000 children and adolescents who were between the ages of five and twenty-one were documented as receiving effective ABA treatment.	See evidence table. Of the citations provided, 102 included individuals over 12, while for 111, age was not specified in the abstract, or was not applicable.
M	4	Reichow and Volkmar, in 2010, reported on 31 studies of children, aged four to fifteen, who benefited from ABA social skills training: "The school-age category had the highest participant total of the three age categories (N =	The authors of this systematic review go on to state the following: "No interventions for preschool aged children or

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		291).”(page 156). “Within the last 8 years, 66 studies with strong or acceptable methodological rigor have been conducted and published. These studies have been conducted using over 500 participants, and have evaluated interventions with different delivery agents, methods, target skills, and settings. Collectively, the results of this synthesis show there is much supporting evidence for the treatment of social deficits in autism.” (page 161).	adolescents and/or adults had enough support to be considered … EBP [evidence based practice] based on the results of this review. Social skills groups for school-aged children with ASD demonstrated the evidence necessary to be considered an established EBP.” And “the EBP criteria were not applied to three of the most commonly used intervention categories (i.e., ABA, parent training, peer training) due to the variability in intervention procedures within the techniques classified.” *For EbGS discussion regarding extending age*
M	5	Bellini and colleagues, in 2007, reported the following age ranges of 155 children who benefited from ABA social skills training: “21 studies involved preschool-age children, 23 involved elementary age children, and 5 studies involved secondary-age students.” (page 158).	This is a meta-analysis of school-based social skills interventions. ABA is not mentioned, and it is not clear which interventions the commenter considers ABA.
M	6	Brosnan and Healy, in 2011, reported on 18 studies of children aged three to 18, who received effective ABA treatment to reduce or eliminate severe aggressive behavior: “All of the studies reported decreases in challenging behavior attributed to the intervention. Of the studies included, seven reported total or near elimination of aggression of at least one individual during intervention in at least one condition.” (page 443). “only four of the studies conducted follow-up assessments. However, each of these studies reported that treatment gains were maintained.” (page 443).	Of the 18 included SSRD studies, 5 included children over 12. *For EbGS discussion regarding extending age to 18*
M	7	Lang, et al. in 2010, reported on nine studies which involved 110 children aged nine to 23, who received a variety of forms of behavior therapy for anxiety. “Within each reviewed study, at least one dependent variable suggested a reduction in anxiety following implementation of CBT.” (page 60). “CBT has been modified for individuals with ASD by adding intervention components typically associated with applied behaviour analysis (e.g. systematic prompting and differential reinforcement). Future research involving a component analysis could potentially elucidate the mechanisms by which CBT reduces anxiety in individuals with ASD, ultimately leading to more efficient or effective interventions.” (page 53).	SR limited to treatment of anxiety (not core symptoms of autism) using modified CBT. Study details not available regarding age, other than range. Treatment of associated symptoms (anxiety) is beyond the scope of this evidence evaluation.
M	8	Hanley, Iwata, and McCord in 2003, reported on 277 studies which involved 536 children and adults	Only 58 of the 277 SSRD studies included individuals with

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		(70% of the studies included persons between the ages of 1 and 18, and 37% also included persons older than 18), who received functional analyses of problem behaviors. Of these, 96 percent were able to yield an analysis of the controlling variables of the problem behavior. The specific functional analysis of individual problem behaviors is crucial to the successful intervention with those behaviors. "Large proportions of differentiated functional analyses showed behavioral maintenance through social-negative (34.2%) and social-positive reinforcement (35.4%). More specifically, 25.3% showed maintenance via attention and 10.1% via access to tangible items. Automatic reinforcement was implicated in 15.8% of cases." (pages 166-167).	autism. 70% of studies included children, defined as < 18. No other information on age provided. *For EbGS discussion regarding extending age of treatment*
M	9	Iwata and colleagues, in 1994, reported on the effective treatment of self-injurious behavior with 152 children, adolescents, and adults. In their sample, 39 were between the ages of 11 and 20, and 74 were 21 and older. The function of the self-injurious behavior could be identified in 95% of the persons, and in 100% of those cases an effective treatment could then be prescribed. "Across all categories of intervention, restraint fading was the most effective, but its 100% success rate is misleading because it was always implemented in conjunction with another procedure. As single interventions, EXT (escape) had the highest success rate (93.5%); sensory integration and naltrexone had the lowest (0%)." (page 233). "Results of the present study, in which single-subject designs were used to examine the functional properties of SIB in 152 individuals, indicated that social reinforcement was a determinant of SIB in over two thirds of the sample, whereas nonsocial (automatic) consequences seemed to account for about one fourth of the cases." (page 234).	The number of individuals with autism, if any, is not specified. (population included patients with mental retardation)
N	1	Please accept these public comments in favor of requiring OHP coverage for applied behavior analytic (ABA) services for individuals of ALL AGES with autism spectrum disorders (ASD). After reading the draft evaluation of evidence, I am left concern that the committee tasked with evaluating existing science in this area did not have adequate representation from someone with expertise in behavior analysis and single subject design (SSD) research. ABA is the applied arm of behavior analysis, which is a science of human behavior. Behavior analysis seeks to best understand the principles that elicit and evoke behavior at the individual level. Thus, by definition, behavior analysis (and its applied arm ABA) are idiographic in nature. As a result, the primary method for studying behavior is at the individual level and involves use of SSD. Such an approach has much greater internal validity than group design research and is particularly relevant to intervention research since, for the most part, intervention is delivered at the individual level.	Thank you for this explanation. SSRD studies were included in the evidence source if they met criteria.
N	2	Unfortunately, certain assumptions regarding which research would be included in the HERC review lead to exclusion of the vast majority of research on the application of behavior analytic principles for addressing different behavioral targets displayed by individuals with ASD; notably, the requirement	The rationale for limiting inclusion criteria in the Warren report to at least 10 participants is reported as follows: "We recognize that setting a minimum of 10 participants

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		that at least 10 subjects be involved in research for a study to be included results in most of the research to be excluded. No justification for this number is provided. Why is 10 better than 9? Why is 10 good enough? Research utilizing single subject design involves control comparison, albeit in a different way than group design. However, I argue that within subject comparison (the hallmark of SSD) is a better comparison that between-group comparison as it emphasizes behavior change at the individual level (again, the target of intervention). With inclusion of research based on SSD, a markedly different understanding of the strength of research on ABA with individuals with ASD is likely to emerge.	for studies to be included effectively excluded much of the literature on behavioral interventions using single-subject designs. Because there is no separate comparison group in these studies they would be considered case reports (if only one child included) or case series (multiple children) under the rubric of the EPC study designs. Case reports and case series can have rigorous evaluation of pre- and post- measures, as well as strong characterization of the study participants, and case series that included at least 10 children were included in the review. **Single-subject design studies can be helpful in assessing response to treatment in very short timeframes and under very tightly controlled circumstances, but they typically do not provide information on longer term or functional outcomes, nor are they ideal for external validity without multiple replications.** They are useful in serving as demonstration projects, yielding initial evidence that an intervention merits further study, and, in the clinical environment, they can be useful in identifying whether a particular approach to treatment is likely to be helpful for a specific child. Our goal was to identify and review the best evidence for assessing the efficacy and effectiveness of therapies for children with ASD, with an eye toward utility in the treatment setting. With the assistance of our technical experts, we selected a minimum sample size of 10 in order to maximize our ability to describe the state of the current literature, while balancing the need to identify studies that could be used to assess treatment effectiveness." See comment #F2 regarding recommended standards for evidence in SSRD.
N	3	What the committee is also encouraged to consider is that ABA is not 1 technique, or even one	HERC was not provided the resources to conduct a de

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		package of techniques. While there are manualized packages described based on ABA, the vast majority of research on the effects of ABA on ASD do not utilize such an approach. Again, this is because the science of behavior analysis, and thus ABA, is idiographic. Considering ABA as a single intervention, much like one might say Ritalin or Prozac are single interventions, rather than as a broad range of strategies based on the theory and principles of behavior analysis is problematic. It leads to a reductionist view of the definition of an intervention. Rather, a more robust approach to reviewing existing research might be to define common specific interventions and analyze the effects of those interventions on behavioral targets, or to take behavioral targets and analyze the effects of behavioral interventions on those targets. Meta-analytic approaches for use with SSD research are described in the research and could be utilized to better understand the full literature on ABA in ASD. Thus, although I am critical of the approach to the review of the evidence, and I encourage future reviews to include people with expertise in behavioral analysis and SSD, I support the recommendation for inclusion of ABA therapies when those therapies are directed by people with appropriate training and expertise in the field of behavior analysis.	novo review of the literature as suggested by the commenter. The Warren report utilized a technical expert panel that included "technical experts on the topic of ASDs in the fields of developmental disabilities, psychiatry, psychology, occupational therapy and educational research to provide assistance during the project … including representatives from our partner organizations (the nominators of the topic), the Medicaid Medical Directors and Autism Speaks. To ensure robust, scientifically relevant work, we called on the TEP to provide reactions to work in progress or possibly overlooked areas of research. TEP members participated in conference calls and discussions through e-mail to: • Refine the analytic framework and key questions at the beginning of the project; • **Discuss the preliminary assessment of the literature, including inclusion/exclusion criteria;** • Provide input on assessing the quality of the literature. "
N	4	I strongly urge the HERC to reverse its recommendation against support for ABA for individuals above the age of 12. No specific rationale is provided for this as a cut-off age. Why 12? Why not 11? Why not 13? Particularly with people with developmental disabilities, chronological age is likely an ineffective proxy for any meaningful decisions regarding treatment. While the committee's review suggests that there is insufficient evidence for ABA beyond the age of 13, again I submit that the literature review conducted by this committee is overly narrow and limited based on several decisions regarding its review approach.	The evidence of effectiveness of ABA is limited to children ages 2-12, based on the Warren report. Rationale for limiting the report to those ages is as follows: "we chose to limit the age range to 2–12 because a) diagnosis of ASDs earlier than age 2 is less established and b) adolescents likely have substantially different challenges and would warrant different interventions than children in the preschool, elementary and middle school age groups. We did, however, add one question (KQ7) focusing on children under age 2; children in this age group are not definitively diagnosable, but may be at risk either because they have a sibling with ASDs, or they

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			may be exhibiting signs suggestive of a possible ASD diagnosis." The Lounds 2012 report that addressed individuals over age 12 found insufficient evidence of effectiveness.
N	5	I agree that existing research suggests that certain interventions that are designed to address core symptoms of ASD may have the greatest impact when implemented with young children. However, many people with ASD display a range of problematic behaviors that are not part of core diagnostic features (e.g., self-injury, aggression) that can be effectively treated using techniques based on the principles of behavior analysis. Further, again by including a more robust representation of the literature on the use of behavior analytic interventions for people with ASD of all ages by looking at SSD research, the committee is likely to come to a very different conclusion regarding whether a cut of age of 12 is meaningful in any particular way.	See comment #N2
N	6	In conclusion, I am strongly in support of coverage for applied behavior analytic treatments for individuals OF ALL AGES with ASD, when delivered by professionals with training and expertise in the science and practice of behavior analysis. The committee is strongly encouraged to provide a more appropriate review of the extant literature by including the thousands of studies that utilize SSD. While RCTs have many benefits, they are not internally valid and do nothing to tell us the effects of an intervention at the individual level. At the very least, a balanced review of the literature that appreciates both the strengths and weaknesses of SSD research and RCTs is encouraged. It is very likely that such an approach would result in even stronger recommendations for coverage of ABA for ASD, and for such coverage for individuals of all ages.	EbGS disagrees that RCTs are not internally valid. Internal validity relates to the magnitude of bias, and is defined in the User's Guides to the Medical Literature as: "Whether a study provides valid results depends on whether it was designed and conducted well enough that the study findings accurately represent the direction and magnitude of the underlying true effect." No citations provided. *For EbGS discussion regarding extending age of treatment*
O	1	As a clinician who has worked for years with people affected by ASD, I applaud the Commission's efforts in favor of ABA inclusion as a prioritized treatment. I would also assert that (1) there should be no minimum age of 2 years for ABA, as younger diagnosed children can benefit substantially from behavioral treatment when clinically indicated and (2) patients over the age of 12 should be given coverage for ABA when indicated, as it is often an important treatment component to address behaviors which can significantly impair older youth's and adult's functioning (e.g. aggression, feeding, etc.)	Thank you for your comment. *For EbGS discussion regarding extending age of treatment*

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P	1	Autism Speaks appreciates the opportunity to offer comments in response to the draft HERC report regarding Applied Behavior Analysis for Autism Spectrum Disorder. We are pleased that the needs of the autism community are increasingly a priority in Oregon and that the state has taken positive and concrete steps to address this critical health issue, including access to evidence based treatment including Applied Behavior Analysis. Most recently, we worked closely with Oregon legislators, state officials, disability organizations, and families to secure the enactment of autism insurance legislation during the 2013 legislative session. This legislation—and the work of the Oregon Health Evidence Review Commission—is vital for services needed by an estimated 1 in 88 individuals diagnosed with an autism spectrum disorder.	Thank you for your comment
P	2	Autism Speaks supports meaningful access to coverage based on medical necessity and recognizes that medical needs can vary *significantly* for each individual diagnosed with autism. Treatment decisions—including the nature, intensity, and duration of services—should be made by the treatment team and individualized to the needs of each family. Specifically, recommending that Applied Behavior Analysis only be provided through the arbitrary age of twelve is problematic. Please note: • Only a minority of the 34 states with an autism insurance mandate varies benefits based on age. In fact, in recent years, states increasingly provide equal benefits without age caps. • CDC autism surveillance indicates the average age of diagnosis in the U.S. is 5.6 years. • The Asperger's diagnosis generally occurs much later: 7.2 years • Children from rural areas and ethnic minority backgrounds are at a particular disadvantage. Research shows that these families have to go to the doctor many more times before receiving a diagnosis, and the age of diagnosis is much older. Because of the substantial evidence that has been provided to you via testimony and public comment, we ask that you revise your recommendations and strongly recommend ABA interventions for people with autism spectrum disorder over the age of 12. As the HERC finalizes these recommendations, we ask that it carefully consider the real-world impact that the new rules will have on Oregon families in need of coverage. Thank you for your consideration of these comments.	All treatments, regardless of diagnosis, need to be individualized, yet that does not eliminate the need for public policy. State insurance mandates are not evidence, but are generally the result of a political process. The charge of the EbGS is to evaluate the evidence pertaining to ABA for the treatment of ASD. The cited ages at diagnosis are within the current recommendations for treatment. Recommendations for coverage of ABA only in those children ages 2 to 12 is a result of insufficient evidence of effectiveness of ABA in individuals older than age 12 based on the source report (Lounds 2012).
Q	1	I am writing to you on behalf of the myriad consumers over the age of 12 that are affected by autism. I am a Board Certified Associate Behavior Analyst and provide evidence based treatment (Applied Behavior Analysis) for individuals with autism between the ages of 2-16. As a behavior analyst I must adhere to the ethical guidelines of the Behavior Analyst Certification Board which states; *The behavior analyst promotes the general welfare of society through the application of the principles of behavior.*	Thank you for taking the time to comment. The HERC process incorporates an evaluation of evidence as well as consideration of costs and public values and preferences in making decisions about coverage recommendations. There is insufficient evidence that

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		The application of the principles of Applied Behavior Analysis to treat socially significant behavior does not have boundaries or barriers regarding age, ethnicity, or any other variable that would suggest that socially significant behavior does or does not apply. Nor does socially significant behavior occur more frequently or intensely for a particular group of individuals. For a 3 year old it may be learning to talk rather than hit others to get his needs met. For an 8 year old it may be learning to be in a group rather than isolation. For a 16 year old it may be learning safety skills rather than taking a ride with a stranger. These are all socially significant behaviors that are necessary for individuals to be a part of our community, contribute to society, and remain safe in our culture. I have worked with individuals with autism for almost 20 years. I have had the opportunity to experience some of the most socially significant behavior changes in each and every individual I have worked with. I urge you to support ABA for ALL individuals. I strongly believe that it is everyone's ethical responsibility to consider and support all members of our community.	ABA is effective in individuals over age 12.
R	1	While I do not live in Oregon, I wanted to write in my support of adding ABA coverage for inclusion in the "prioritized list" of treatments in the Oregon Health Plan. My own son is autistic, and the difference ABA therapy has made in his life is astounding. A little over a year ago (at the age of 2 & 1/2), my son was considered non-verbal and had a severe language delay. Last November, he started an intensive treatment program and received 24 hours of ABA therapy a week. In just a number of months, he begin speaking and now has a vocabulary of over 1,000 words. More than that, my son is learning the skills necessary to become an independent adult. I strongly encourage HERC to add ABA therapy to their prioritized list and that there be no minimum age. Children can be diagnosed as early as 18 months (my own son was diagnosed just after his 2nd birthday), and new medical breakthroughs are lowering the age constantly. Early treatment gives a child the best chance for success. Additionally, while treatment at a young age is generally the most effective, patients over the age of 12 should still be given coverage for ABA therapy when medically necessary. Even at an older age, the quality of life, reduction of self-injurious behaviors, and skills gained can still be significant.	Thank you for your comment. *For EbGS discussion regarding extending age of treatment*
S	1	Since January 2006, my son has received 30-40 hours of ABA per week. We chose ABA on the medical advice of our pediatrician, the long-standing research supporting ABA, and the experiences of other parents who saw positive outcomes for their autistic children using ABA. Because of a lack of service providers, we converted a bedroom into a playroom, outfitted it with supplies, secured a behavior consultant to oversee the program, and hired line therapists. We paid for it out of pocket, as Kaiser (our insurer at the time) offered no ABA. In 2008, Providence Health Plans began covering our son's	Thank you for sharing your story. *For EbGS discussion regarding extending age of treatment*

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		program in accordance with an IRO decision that overturned its denial of coverage. It continues to pay for his ABA program to date. A little about our son: his development was on track until age 2.5. He was a beautiful toddler, speaking two languages, and showing interest in all the things typical 2 year olds enjoy. We were astonished and helpless watching this verbal, engaged child growing silent, lining up cars, or launching into a meltdown for no clear reason. Our primary concerns became to help him recover his language and relieve his obvious distress in a world that was now foreign to him. Data from those early days tracked the progress of our non-verbal, highly anxious child as he made progress on goals like eye contact, verbal imitation, expressive labels, gaining attention, and receptive commands. The progress was gradual, but we saw greater progress when we pulled our son from public school at the start of first grade so he could receive intensive ABA. Clinician treatment reports included assessments like these: • N. was observed to make eye contact more consistently and more spontaneously. When he doesn't provide eye contact spontaneously, he responds to a verbal prompt of "let me see your eyes" or "I need your eyes" within 1-2 seconds 90% of the time. When someone enters the room, he looks up at them 100% of the time. (1/21/08) • This Clinician was able to understand 17 words/phrases in a 2 and a half hour observation. It was observed that N.'s articulation decreased toward the end of the session when he was more tired. (1/21/08) • N. can sustain eye contact consistently on average for 5 seconds or more. He also makes shorter eye contact, but quite often and quite naturally. It's wonderful to see! (10/27/08) • When he is motivated and engaged, he will engage with a play partner for longer than 20 minutes.(10/27/08) • N. has also become more flexible as far as when he is requested to do something he does not want to do, he may protest, but does give in without a problem. (7/20/08) • Modeling continues, but we are seeing longer sentences and spontaneous loops of conversation. For example, N. will ask, "Bob the Builder – sing!", "Go to Sauvie Island," or "I want car – airport – fly," which is especially exciting to hear. A majority of his language is comprised of three word sentences, so we continue to work on this goal. (8/31/09) • When engaged, N. can sustain eye contact up to 12 seconds. N. consistently sustains eye contact for about 7 seconds in 3 out of 5 opportunities, not quite 4 out of 5 yet. (6/9/10) • N. is using up to 6 word sentences, but consistently he is using 4-5 word sentences in 3 out of 5 opportunities, not quite 4 out of 5 yet. (6/9/10) • N. was observed to answer correctly "what" and "where" questions. He also answers	

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		questions with regard to "who." He stills struggle with answering "when" questions. He is making great stride with this goal!! (1/17/11) • N. appears to be very motivated by writing and drawing. He often requests for writing and drawing of logos like Target. Therapists are reporting they are able to fade the hand-over-hand prompt, and in some cases he can draw without HOH. (1/17/11) • N. is spontaneously asking "What is it?" when he wants to know about something. He is doing this at least in 3 out of 5 opportunities. (10/31/12) • N. consistently references others to share in his favorite activities, and he will do so with prompt if it is a new activity. N. also responds very well to subtle hints/cues from adults to share his activity. (10/31/12) • N. has learned to navigate [ProLoquo2Go], and use it to help express himself when he can't think of or say the word or phrase in the moment. (3/15/2012) • N. has a very strong understanding of language, and has demonstrated the ability to learn new skills with minimal training (trial presentations). He demonstrates the ability to organize himself within activities and requested behavior. N. also demonstrates sophisticated problem solving skills within preferred and non preferred activities. (3/15/12) • N. has developed an interest in his peer group, and is beginning to co-regulate among a small group of peers characterized by staying with the group, understanding when it is his turn or another's turn, and participating in activities. (9/15/13) I understand that the HERC is considering its recommendation re: coverage of ABA for children older than 12. I urge you to strongly support this coverage, as there is a subpopulation of children on the autistic spectrum like our son who will need ABA past this age. I can state with confidence that the majority of parents I know report that their autistic children do not require ABA past early childhood. However, denying coverage of ABA to those who do constitutes a cessation of medically-necessary services and is discriminatory. ABA has helped N. better manage the symptoms of autism, and is responsible for improving his quality of life and increasing independent skills.	
T	1	I applaud the Commission's recommendation of coverage for Applied Behavior Analysis for children aged 2-12 suffering from Autism Spectrum Disorder and urge the Commission to recommend coverage of ABA for older patients suffering from ASD. The Draft report which claims that there is insufficient evidence of the efficacy of ABA as a treatment for ASD for older patients relies on reports such as AHRQ and Hayes, the latter of which has been thoroughly discredited by several federal courts. The draft report discounts or fails to consider any study that has a fewer than 10 participants or does not randomly assign participants to study or control groups. However, decisions to deny coverage of ABA for ASD based on these same criteria have been found to be arbitrary and capricious	The Warren report includes study designs of all kinds that include at least 10 participants, not only those that use random assignment. Legal decisions are not evidence of effectiveness. The charge of the EbGS is to evaluate the evidence pertaining to ABA for the treatment of ASD. EbGS does not believe the evidence is sufficient to content that ABA is effective in individuals over age 12.

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		and have been overturned by numerous federal courts which, in so doing, have rejected the argument that insufficient evidence supports the efficacy of ABA because few large studies or randomized studies have been done. Courts have recognized that ABA is the standard of care for autism spectrum disorder for patients of all ages, that ABA results in dramatic improvement in function for many of the individuals who receive it, and that no comparable alternative treatment exists when effectiveness and potential for harmful side effects are considered. Attached (see references) are several decisions from federal courts which overturn refusals to cover ABA for ASD and order coverage. I urge you to reconsider your recommendation against coverage of ABA for patients suffering from ASD who are older than age 12.	*For EbGS discussion regarding extending age of treatment*
U	1	I urge you to consider a broader range of evidence and expert testimony on the effectiveness of Applied Behavior Analysis and the full range of conditions it can treat. The draft report demonstrates that for an unknown reason this committee focused almost exclusively on ABA as it relates to early childhood intervention. That focus left out significant research showing that, among many appropriate applications of ABA, it represents the *only* behavioral intervention that has efficacy data in the treatment of severe problem behaviors in individuals with autism and/or intellectual and developmental disabilities (IDD) such as self-injury, aggression and pica. Please consider that the incidence of severe problem behaviors in individuals with IDD has been estimated to be 10% for the most severe behaviors (life-threatening) and to up to 40% when less severe behaviors are included (see attached Hagopian, et al.) These severe behaviors (self-injury, aggression, pica, etc.) lead to significant medical consequences for the individual, caregivers and family. Also, these behaviors are manifest in individuals of all ages throughout the lifespan. The current committee recommendation wouldn't help many (and perhaps most) of Oregonians suffering from these behaviors.	The HERC was given the directive in legislation to evaluate the evidence on ABA as a treatment for ASD; their charge was not to evaluate ABA for other conditions. The EbGS evaluation included review of a comprehensive report completed by AHRQ (Lounds 2012) on the effectiveness of treatments (including ABA) for individuals with ASD from ages 13 to 30.
U	2	Our daughter's self-injury (she has autism, IDD and is non-verbal) was occurring at the rate of 600-900 times per day and included fist-to-head, knee-to-head, head to hard surfaces (tables, walls, floor) and head-butting to caregivers and family. When this behavior began at age 8, we sought treatment from neurologists, psychiatrists, occupational and physical therapists throughout the Pacific Northwest including OHSU and Children's Seattle. We ruled out underlying medical conditions and tried over 25 different psychiatric medications. Unable to safely care for her in our home with limited OHP/Medicaid funds, we were forced to make the wrenching decision to move her to an OHP funded group home when she was 11 years old. This group home had access to the best of Oregon's services for individuals with IDD and severe behaviors. After three years her self-injury was getting worse and she was so afraid of herself that she would cry and hit herself at a rate of over 40 times per minute	Thank you for sharing your story.

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		unless she was wrapped in blankets and pillows from her neck to below her knees. Finally we sought help from the nation's most renowned inpatient program designed to help individuals like our daughter just last year when she was 15 years old - Kennedy Krieger Institute at Johns Hopkins in Baltimore, MD. Using a multidisciplinary approach and ABA principles allowed doctors to identify the function of her self-injury and target treatment to those functions. After a 5 month admission our daughter's self-injury was reduced by over 90%. Almost a year later she continues to have a successful behavior treatment program here in Oregon that was developed at Kennedy Krieger. She is happy, anxiety-free and no longer needs to be wrapped in blankets and pillows to feel safe from herself.	
U	3	Please review the important evidence included in the following articles which articulate the medical necessity of treating problem behaviors and list the strong evidence which supports the efficacy of ABA. I can assure you that parents of children (both young and adults) suffering from problem behaviors would tell you that we can't give up on our children and we would be consigning them to a life of suffering from severe behaviors without access to ABA. We need you to understand that NO other behavioral intervention has been shown to be effective for our children. Matson, J. L., & LoVullo, S. V. (2008). A review of behavioral treatments for self-injurious behaviors of persons with autism spectrum disorders. *Behavior Modification*, *32*(1), 61-76. Hagopian, L. P., Rooker, G. W., Jessel, J., & DeLeon, I. G. (2013). Initial functional analysis outcomes and modifications in pursuit of differentiation: A summary of 176 inpatient cases. *Journal of Applied Behavior Analysis*, *46*(1), 88-100.	Matson is a descriptive review article of the kinds of treatment of SIB in individuals with ASD compared to those with intellectual disability (ID), finding much more research on the latter. Authors state, "Unfortunately, rarely are failed treatments, whether applied systematically or not, reported. And when they are noted, it is typically in a very cursory fashion." Hagopian is a consecutive case series of 176 individuals with ID and severe problem behavior who completed functional analysis (FA) in an inpatient setting. Over half had ASD. The paper examines whether specific forms of modification lead to increased success in identifying the function of various problem behaviors. A function was identified in 86.9% of the 176 cases, and in 93.3% of the 161 cases for which the FA, if necessary, was modified up to 2 times. Also reports that differentiated outcomes ultimately were obtained for 86.9% of the 176 cases. *For EbGS discussion with experts*
V	1	We appreciate the effort that went into drafting the above-referenced report and the opportunity to comment on it. Unfortunately the report does not represent an evaluation of the evidence on applied behavior analysis (ABA) interventions for autism spectrum disorders (ASD) and should not be used to guide coverage decisions because The report mischaracterizes the discipline of behavior analysis, its research methods, and its	The commenter does not specify what interventions are misclassified. See comments #F2 and #N2 regarding rationale for limiting what research was considered.

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		applications in treating ASD. • Reviewers misidentified several interventions as ABA that do not have the defining characteristics of ABA. Consequently, many of the studies reviewed did not involve ABA interventions. • Reviewers did not consider evidence from the full range of scientific studies on ABA interventions for ASD. • Most of the scientific research on ABA interventions for ASD was excluded. Because the stakes are high, we strongly urge the HERC to revise its report with input from professionals with expertise in behavior analytic concepts, research methods, and applications to ASD. We offer the following to help guide the revision.	
V	2	**Behavior analysis** is a natural science that views behavior (rather than hypothetical entities like mental structures and processes) as its subject matter, and observable environmental variables as the principal causes of behavior. Behavior occurs only at the level of the individual, so **behavior analytic research** involves observing and measuring the behavior of individuals in relation to environmental events in the framework of single-case research designs (SCRDs). **These are not descriptive "case studies," but rigorous controlled experiments.** Behavior analytic research methods are **well-suited for evaluating many treatments for ASD**, which manifests behaviorally and affects each individual differently.	EbGS acknowledges this distinction.
V	3	In a typical ABA study, the target behavior is a skill to be developed (e.g., asking for help, completing a hygiene routine, cooperating with a medical procedure) or a maladaptive behavior to be decreased (e.g., self-injury, wandering, consuming inedible items). Many studies involve more than one behavior and participant. Each behavior is defined in observable terms and measured in repeated sessions under baseline (control) conditions without the treatment of interest in place, and with the treatment in effect (the experimental condition). Treatment procedures are environmental events that are arranged to precede (e.g., prompts, cues) and/or follow (e.g., reinforcers) occurrences of the behavior close in time. Baseline and treatment phases are repeated with the same individual and/or other participants. Graphed data are analyzed to determine if a treatment produced clinically meaningful improvement in comparison to baseline or another treatment procedure**.** That is, **ABA studies are controlled clinical trials (CCTs)** in which each participant experiences the control and treatment conditions, and comparisons of those conditions are replicated**.** Thousands of peer-reviewed studies have evaluated ABA procedures for building skills and reducing problem behaviors in many clinical and non-clinical populations in a wide range of settings.	EbGS is aware of SSRD and that these can be considered controlled trials. See comment #F2 for limitations of SSRD. Total number of citations provided, including legal decisions and guidelines, totaled 337.
V	4	Well-designed ABA CCTs produce rich information about behavior change procedures and individual responses to treatment that cannot be derived from most studies using between-groups research	SSRD are by definition not generalizable to populations. EbGS agrees that generalizability is improved by

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		designs with statistical analyses of group averages and other mathematical abstractions. The **generality (external validity)** of ABA interventions is demonstrated empirically with replications, rather than by speculating about whether study samples represent populations. Many ABA CCTs have been conducted in homes, schools, and community settings, which strengthens their generality.	replication, as referenced in proposed standards outlined in comment #F2.
V	5	In practice, ABA interventions comprise ***focused interventions*** using a small number of procedures to address a small number of treatment targets to be increased (e.g., following instructions, completing hygiene routines, cooperating with medical procedures) and/or decreased (e.g., self-injury, wandering, consuming inedible items), or ***comprehensive interventions*** in which many procedures are used to address multiple targets. Decisions about specific procedures as well as the intensity and duration of treatment are based on scientific research, professional knowledge, direct behavioral observations, and the characteristics, needs, and preferences of the individual client and his/her family.	EbGS acknowledges this. *For EbGS discussion with experts: clarification regarding distinction between focused and comprehensive interventions*
V	6	Specific **recommendations for revising the draft HERC report** are: Delete studies and reviews of interventions that do not have the defining characteristics of ABA *as verified by professional behavior analysts with experience in designing, overseeing, and studying focused and comprehensive ABA interventions for ASD.*	The commenter does not specify what these are. *For EbGS discussion with experts*
V	7	Clearly distinguish focused and comprehensive ABA interventions, and consider the scientific evidence on each from ABA CCTs as well as group design studies involving people with ASD *of all ages.*	Both focused and comprehensive interventions were eligible for inclusion in the Warren report. See comment #Y6. *For EbGS discussion with experts*
V	8	Review the documents in the attached reference list for scientific evidence about the effectiveness and risks of ABA interventions *in comparison to no intervention and other interventions, as required by the HERC Guidance Development Framework.* The documents include: • Technical reviews conducted by teams that included expert behavior analysts and used standardized protocols for evaluating SCRD studies as well as group-design studies. Those reviews meet a HERC criterion for high-quality evidence (evidence-based guidelines from trusted sources). • Systematic reviews, meta-analyses, and other analyses of data from multiple ABA CCTs of focused ABA interventions for behaviors that directly affect the health, safety, and overall functioning of people with ASD. Several meta-analyses demonstrate methods of aggregating data across many SCRDs to yield evidence of both statistically and clinically significant effects with large Ns. Those sources meet HERC criteria for high- or medium-quality evidence. • Two meta-analyses of data from studies of early intensive ABA intervention by Eldevik and	The technical reviews include one of 2 evidence reviews commissioned to inform the NZ guideline on the treatment of autism, the NAC NSR (see comment #G2) and the New York state guideline (see comment #I5). See evidence table for SRs and MAs (total of 26 citations). Eldevik 2009 was limited to EIBI (ages 2-7), included 34 studies, 9 of which were controlled, and calculated effect sizes for intelligence and adaptive behavior that are considered moderate to large. Eldevik 2010 had similar inclusion criteria and assessed individual patient level data. Results found reliable change in IQ in 30% of the treatment group compared to 9% for control, and

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		colleagues. Those authors included only studies in which the ABA intervention had characteristics on which behavior analysts who design and study such intervention agree. Their 2010 meta-analysis, which used individual participant data from 16 group-design studies, provides the strongest available evidence on the effects of bona fide intensive ABA in comparison to standard interventions for young children with ASD.	reliable change in adaptive behavior of 21% compared to 5%. These support the current recommendations in the evidence evaluation.
V	9	Describe the quality of evidence on focused and comprehensive ABA interventions for children ages 0 – 12 years as "high," and strengthen the rationale for the strong recommendation for coverage.	The EbGS has made a strong recommendation for coverage in this population, despite low strength of evidence.
V	10	Strongly recommend ABA interventions for people with ASD over the age of 12 because the quality of evidence is medium to high, there are few other safe and effective interventions, and depriving people with ASD of effective ABA interventions puts their health and safety at risk and increases costs for their healthcare and other services.	*For EbGS discussion*
W	1	Most people, parents, clinicians, and most certainly insurance company administrators, do not understand ABA or how it works to improve function in children with autism. In my opinion, most ABA professionals have done a poor job of explaining it. Sometimes they describe what they do using lots of jargon and scientific-sounding terms that are off-putting to policy makers and parents alike. I too was unsure about the technique until I worked closely with BCBAs and other practitioners and children and saw first-hand the strides children make when receiving ABA therapy. The HERC should listen with an open mind to the many success stories it will hear.	Thank you for these comments. This public comment process is a reflection of HERC's commitment to hear all perspectives. Our process used to develop this evidence evaluation includes public comment as well as an evaluation of the evidence.
W	2	Not all children require ABA therapy. It will not be medically necessary for many children. It is best used with those who: • Have unsafe and/or self-injurious or aggressive behaviors • Are non-compliant with simple parental instructions ("come here", "sit down", etc.) • Are still living in the home with their parents • Have parents who are invested in learning the technique and support therapy at home • Have parents who comply with all attendance requirements ABA will not be effective if a child does not receive regular and frequent visits with their therapists, working on the identified "programs". With ABA quantity is as important as quality. Our clinic required 3 to 5 days of attendance per week. Children progress much more quickly when they get in the routine of coming to clinic and "going to work" on a regular basis. Using ABA, children can be taught to participate in their own health care. For example, our therapists taught children to swallow pills, thereby improving compliance with their medication regimens. We	Thank you for these helpful, concrete insights and recommendations. Some of these recommendations are implementation issues and are more specific than what is required for the purposes of this evidence evaluation.

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		taught them to be tolerant of a wider range of foods, thereby improving nutrition. We taught them to use the toilet and wash their hands, reducing the spread of germs and diaper rash as well. (remember, many of our autistic teens are still in diapers.) We taught overweight children how to reduce their fear of playing on a playground, thereby improving mobility. We taught "car seat Houdinis" to stay buckled in the car seat, thereby reducing the risk of accidents by distracted parents. We taught non-verbal children how to ask for help. All humans deserve the ability to ask for help. ABA therapy can be life saving. A child who cannot respond to simple demands such as "stop" "come back" or "no!" is a danger to himself and others. ABA helps break the autistic "bubble" that prevents children from complying to their parents' instructions. Anyone who has ever parented a young, stubborn two-year old, can relate, then, to the difficulty of trying to stop a 12 or 15 year old young man from running into traffic or jumping into a pond. A child who has, through discrete trials, learned to STOP on command is a safer child. * For best results, children should be served by programs who assign multiple practitioners to each child. A good treatment plan includes the rotation of therapists to encourage flexibility in routine and generalization of skills, both of which are difficult for kids with autism. The majority of hours spent in “table time” need not be provided by a BCBA, but rather by trained paraprofessionals with oversight by BCBAs. Funded agencies must adhere to supervision standards to ensure that paraprofessionals are conducting. It is essential, however, that a BCBA oversee the programs and know when to "push" the child to the next level of competence. Programs should be challenging to children and therapists must never let children rest on their laurels too long. We used to tell parents that "when a child has autism, he has to get to work earlier and stay later, because their work load is bigger." ABA works. The best evidence is provided by parents who have seen their children become functional after years of dysfunctional, unhealthy behavior. Let me share a quick story about my child who is 25 years old and now a college graduate. She was non-verbal. I grieved her inability to speak and feared one thing more than another: That my daughter would not be able to say the word "no." "How can a child protect herself," I wondered, "if she can't say "NO. Through the efforts of a very talented speech therapist who utilized an ABA-based approach in a medical setting (a stroke rehabilitation clinic at the Riverside Community Hospital) my daughter learned to talk.	
X	1	As a professional who provides ABA treatment to individuals with autism in Central, Southern, and	Thank you for your comment.

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		Eastern Oregon, I would like to submit my comments on the HERC draft evaluation of the evidence for ABA. The HERC findings have very important implications for citizens in Oregon who are affected by autism, particularly for those vulnerable individuals served by the Oregon Health Plan. It is vital that we meet the needs of these individuals by affording them the same medically necessary behavioral health treatments that are available to others in the state. I am pleased to read the strong recommendation for coverage of comprehensive ABA services for children with autism ages 2-12. However, I strongly urge that HERC revisit the finding that the evidence supporting comprehensive ABA is low, as well as the age restriction against ABA for children under age 2. Additionally, I strongly urge that the commission review the recommendation against coverage of ABA interventions for older children and adults, as well as the finding that the quality of the evidence is weak for these interventions.	
X	2	In drawing conclusions about the evidence for ABA interventions, it is imperative that the HERC review not be limited to randomized controlled trials (RCTs) and comparative effectiveness reviews. Because RCTs are often unethical or not feasible with this highly individualized, often long-term treatment for a vulnerable population, it is essential that other kinds of experimental designs and evaluations be considered. As shown in the attached reference list, there are many trusted sources that have concluded the evidence supporting ABA is strong. Additionally, under its own process framework, HERC is obligated to consider a variety of kinds of evidence, such as peer-reviewed studies, guidelines published by professional organizations, and cost-benefit analyses. In particular, there are a number of meta-analyses of single subject experimental research designs that provide evidence of ABA's effectiveness across age ranges and symptoms. Furthermore, the commission must reexamine the literature supporting focused ABA interventions. While RCTs of these interventions are not available because of the nature of the treatment and severity of symptoms, there is an abundance of single case research studies and meta-analyses supporting focused interventions. While much of my practice involves comprehensive ABA or EIBI, a significant portion of my clinical practice also involves using focused interventions to treat severe challenging behaviors. This work is critical for families, because it addresses symptoms that are extreme and can be life threatening. For example, elopement, or running away, is a common behavior among individuals with ASD, and one that poses a significant risk due to safety hazards such as drowning or traffic accidents. Research in focused interventions supports functional behavioral assessment and function-based treatment of elopement (e.g., Lang et al., 2009). In my clinical practice, I have used focused interventions to treat elopement, and it has been essential to the day-to-day well being of patients and the functioning of families.	The evidence evaluation is not limited to RCTs and comparative effectiveness reviews; see comment #L3. RCTs have been conducted and are included in the evidence; hence EbGS does not believe they are not feasible or ethical. A number of other experimental designs are also included. HERC is not obligated to consider a variety of kinds of evidence, but in the case of this evidence evaluation, has included a number of different types of evidence, including RCTs, cohort studies, case series and SSRD. They also consider values and preferences and resource implications, as noted in the GRADE table. Lange 2009 is a SR of SSRD evaluating treatments for elopement. It included 10 studies and 53 participants, of which 6 had ASD. Only 5 of the 10 studies utilized an experimental design, and the authors state: "the existing literature base is perhaps best described as limited with respect to the overall scope and quality of the existing corpus of studies" and "In terms of methodological quality, perhaps the most important limitation is that

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			many of the studies appeared to lack a recognized experimental design. Thus the reports of positive outcomes for 80% of the studies must be interpreted with caution."
X	3	Another way in which focused interventions may improve the health and well being of patients is by teaching tolerance for medical procedures. In my practice, I often implement interventions designed to improve behavior during dental cleanings or medical procedures. For example, if a patient is taking a medication that requires regular blood draws to monitor organ functioning, it is essential that the patient tolerate needles. Often, individuals who do not have access to this kind of focused intervention must be restrained or sedated in order to receive routine dental and medical procedures. The literature supports focused ABA as an effective means of teaching individuals with autism and other developmental disabilities to tolerate important medical procedures (e.g., Shabani & Fisher, 2006). There are many more examples of ways in which focused interventions can improve the health, well being, and safety of individuals with ASD, and it is vital that this literature be considered, given the nature of symptoms and the implications for those who are in need of this type of treatment.	Shabani 2006 is SSRD report of one participant whose needle phobia was treated successfully with stimulus fading and differential reinforcement.
X	4	I strongly recommend that you work with the ad-hoc ABA expert, Dr. Eric Larsson, to revisit the body of literature evaluating ABA. In doing so, it is vital that Dr. Larsson be allowed to assist in identifying studies for which the intervention procedures were truly behavior analytic, so that studies that do not meet the standards of the field may be excluded. Additionally, Dr. Larsson can help the commission better understand the various interventions that meet criteria to be considered ABA, in particular distinguishing between comprehensive versus focused interventions. Given the very different aims and parameters of these two categories of intervention, it is important that the evidence for each be considered separately. Finally, it will be important to carefully consider the information and sources provided by other experts who have testified before the commission, including Dr. Gina Green of the Association of Professional Behavior Analysts, Dr. Louis Hagopian of The Kennedy Krieger Institute, and Dr. Brian Reichow of Yale University.	See comment #Y2. Testimony by Dr. Larsson and the other (non-appointed) experts is addressed in this document (Dr. Green and Reichow), and references provided by Dr. Hagopian are included in the evidence table. We have not received requests to remove any specific studies from the evidence evaluation because they do not pertain to ABA. *For EbGS discussion with experts*
X	5	I urge you to maintain your strong recommendation in favor of coverage of comprehensive ABA treatment for children through age 12, but remove the minimum age limit of 2 years. Given the multitude of sources supporting ABA, including reviews by trusted sources, peer reviewed studies, and guidelines from professional organizations, the quality of the evidence should be revised to "high." This recommendation from HERC will enable young children with autism to receive appropriate, comprehensive behavioral health treatments that will help many children to achieve functioning in the normal range, saving significant costs long term. Furthermore, I urge you to revise	It is unclear why the evidence for older individuals should be rated as "medium". *For EbGS discussion regarding extending age of treatment*

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		your recommendation regarding focused interventions for older children and adults. Based on the HERC's standards, the quality of evidence for these interventions should be rated as "medium" at minimum. Given the importance of these interventions to the health and well being of individuals with autism, as well as the risks of not treating certain symptoms, the recommendation should be "strong" in favor of coverage.	
Y	1	The Oregon Association for Behavior Analysis Board has reviewed the HERC draft coverage guidance for ABA. We have several concerns that we ask that you urgently address. First, we ask that the commission members work with experts in behavior analytic research methods and intervention procedures to better understand the evidence on ABA interventions and to address key concerns with the sources relied upon for the draft report. Specifically, 1. Many interventions that were reviewed for the draft report are not in fact ABA interventions. The result is a misleading picture of both the nature of ABA interventions and the evidence of their effectiveness. To establish valid criteria for inclusion and exclusion of studies for review, the commission should consult the ad-hoc expert in ABA, Dr. Eric Larsson.	See comment #X4
Y	2	2. The commission must also work with Dr. Larsson to better understand the full range of ABA interventions and the scientific evidence on their effectiveness. Those interventions may be categorized as follows: a. Early intensive ABA and other **comprehensive ABA intervention** models involve 26-40 hours per week of intensive intervention in which multiple ABA procedures are used to address multiple treatment goals and symptoms. The best meta-analyses of controlled group-design studies on bona fide early intensive ABA indicate that when it is designed and overseen by qualified behavior analysts and delivered for at least 30 hours per week for at least two years, it is effective for producing large improvements in many children with autism who begin intervention before age 8, and more modest but still clinically significant improvements in many others. Contrary to the HERC draft guidelines, there is no indication that comprehensive ABA intervention is ineffective for children younger than 2 years or older than 8 years; in fact, most of the procedures that comprise comprehensive ABA intervention have been shown to be effective in thousands of replicated ABA controlled clinical trials. b. **Focused ABA interventions** address small numbers of specific treatment goals and symptoms, including targets that directly affect the safety, health, and overall functioning of people with autism of all ages. The number of hours of intervention per week and the duration of intervention varies with the nature and severity of the individual client's	Thank you for providing a definition of comprehensive vs. focused ABA. However, since both categories still can include multiple treatment goals and the hours per week can vary for focused ABA, presumably above 25 hours in some cases, the distinction still remains unclear. The evidence source included interventions that may be defined as comprehensive and focused ABA. The optimal duration and intensity of comprehensive type interventions versus focused, and even a fully implementable distinction, is unclear. The current recommendation for coverage of ABA between ages 2 and 12 would allow for coverage of both. Whether there should be differing requirements for ongoing evaluation and proof of individual efficacy will need to be addressed. *For EbGS discussion with experts* With regard to children under 2, the primary evidence

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		treatment targets, level of functioning, life circumstances, and other factors. Procedures used in focused ABA interventions have been proved effective in thousands of replicated ABA controlled clinical trials involving people with autism ranging from young children to adults. Many studies of focused ABA interventions have been aggregated and analyzed in high-quality technical reviews, systematic reviews, and meta-analyses overlooked in the HERC draft report. In overlooking the evidence on focused ABA interventions, the commission risks depriving many individuals with autism of effective treatment.	source (Warren 2011) found insufficient evidence to determine efficacy; see comment #N4. The draft evidence evaluation does not state that ABA is ineffective for children older than 8. Citations not specified. See evidence table. Commenter provided 20 references.
Y	3	3. The review must include evidence on ABA interventions from studies using a range of sound scientific research designs rather than just the results of randomized clinical trials (RCTs), other studies using between-groups research designs with statistical comparisons of group mean scores, and comparative effectiveness reviews. Although RCTs and inferential statistics are appropriate for addressing some important research questions about some treatments for some populations, they have ethical, practical, and other constraints that limit their utility for evaluating certain types of treatments for certain disorders and conditions. A number of other research methodologies are better suited for answering questions about the direct effects of treatment procedures on behavior, and the effects of many types of treatments on individuals. We urge the commission to review the attached reference list in revising the current draft, with guidance from Dr. Larsson. The list includes sources that are considered "high quality" by HERC standards, including systematic reviews of controlled clinical trials that used a range of research designs, and evidence reviews by teams that included expert behavior analysts. It also includes several "medium quality" sources, such as well-conducted peer-reviewed studies and meta-analyses. We also ask the commission to consider the recommendations of professional societies, such as the American Academy of Pediatrics, and the oral and written testimony of expert behavior analysts Dr. Gina Green, Dr. Louis Hagopian, and Dr. Brian Reichow.	The evidence evaluation does include a broad range of research designs. See evidence table. See comment #I6.
Y	4	Second, we ask that the commission work within the framework set by HERC. Specifically, • The commission is obligated to consider sources other than RCTs and comparative effectiveness reviews (ORS 414.701), the full range of peer reviewed literature (ORS 743A.062), and evidence related to clinical and cost-effectiveness (ORS 414.690(3)).	For clarification, the statutes cited were established by the legislature, not HERC. See comment #L3 regarding comparative effectiveness. ORS 743A.062 defines peer reviewed literature as "scientific studies printed in journals or other publications that publish original manuscripts only after the manuscripts have been critically reviewed by unbiased independent experts for scientific accuracy,

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			validity and reliability. Peer-reviewed medical literature does not include internal publications of pharmaceutical manufacturers". ORS 414.690 states that the HERC "Shall consider both the clinical effectiveness and cost-effectiveness of health services, including drug therapies, in determining their relative importance using peer-reviewed medical literature as defined in ORS 743A.060". EbGS believes that they have met these requirements.
Y	5	• Based on the HERC Guidance Development Framework, there are many paths to a "strong" recommendation. It is important that the commission consider other factors in addition to the published evidence, such as the availability of alternative treatments, the risks and benefits of treatment, the prevalence of the treatment, and the feasibility of clinical research study.	The Guidance Development Framework does not determine the final recommendation, but rather is used by HERC as a guide. That said, EbGS has considered other factors in addition to the published evidence, which is how the current recommendation for children 2 to 12 is strong rather than weak, which is the rating that would have been provided had patient preferences not been considered.
Y	6	We are pleased that the commission is making a strong recommendation for coverage of ABA for children age 12 and under, but we have grave concerns about the other conclusions the commission has reached. After considering the factors just described, the commission should conclude that • The quality of the evidence is *high* for comprehensive ABA intervention for children age 12 and under, and the commission should make a strong recommendation in favor of coverage of ABA for children age 12 and under *with no minimum age limit*. • The quality of the evidence is *moderate* to *high* for focused ABA interventions for people with autism of all ages, and the conclusion should be a *strong* recommendation in favor of coverage. • Because ABA is a highly individualized approach, coverage should be based on individualized assessments and recommendations made by qualified professional behavior analysts, rather than a generic guideline. The HERC coverage guidance on ABA has important implications for Oregon's most vulnerable residents. It would be unfortunate if an overly restrictive review process resulted in limited access to vital therapeutic interventions for individuals on the Oregon Health Plan, when across Oregon and the nation others are benefiting from improved access to medically necessary, evidence-based ABA	The evidence evaluation is not a guideline; it is an evaluation of the evidence with recommendations for coverage for the OHP. As such, it is a policy document, and does not provide specific guidance for individuals. However, the coverage recommendation does contain a requirement for individualized treatment and periodic evaluation in order to ensure that services provided benefit the patient. See comment #H2. There is no distinction made in the core sources, nor in the public comments received, to distinguish which studies involved comprehensive vs. focused ABA in order to make a separate recommendation.

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		interventions. Thank you for addressing our concerns.	*For EbGS discussion regarding extending age of treatment*
Z	1	I commend HERC for recommending coverage of ABA for young children. I hope that HERC will change its recommendation for older patients. Unfortunately, the Draft Evaluation of Evidence on Applied Behavior Analysis for Autism Spectrum Disorders ("the Draft") indicates that crucial information submitted to HERC has not been considered, and the Draft does not reflect adherence to HERC's published process or processes.	EbGS disagrees that the draft evidence evaluation does not reflect adherence to HERC's process. Public comment that is submitted is addressed in this document and in the evidence table. See comment #H2.
Z	2	1. The Draft characterizes the strength of evidence as "low" in contradiction of its own process and without any explanation whatsoever. The Draft Evaluation characterizes the quality of the evidence supporting both EIBI and other ABA interventions for young children as "low." The Draft claims that the HERC has made its own assessment of the quality of the evidence, but that assessment is not described in the document, and the "low" assessment contradicts HERC's published process. The only discussion of strength of evidence in the Draft comes from the source documents and characterizes strength of evidence as low because there are relatively few randomized controlled trials. However, nothing in HERC's stated process permits HERC to assess the strength of the evidence based on the number of randomized controlled trials or even the size of studies. HERC's Biennial Report, presented to the autism community as an official statement of HERC's process and attached, states that systematic reviews of prospective cohort studies and evidence-based guidelines from trusted sources are "high" quality. According to the same document, medium quality evidence sources include guidelines issued by professional societies and advocacy organizations (e.g. American Heart Association), coverage decisions by private health plans, and well-conducted, peer-reviewed individual studies (experimental or observational).	See comment #H2. EbGS disagrees that the "low" assessment of the strength of the evidence contradicts the HERC processes. EbGS used the strength of evidence evaluation of the Warren report, and also reviewed additional studies identified in the Maglione update. Rationale for strength of the evidence is given on page 14: "Given the small sample sizes in most trials and the diversity in interventions, it seems likely that the overall strength of the evidence remains insufficient to accurately draw conclusions about the effectiveness of parent training programs." And for Key question #2, "This suggests that the overall prior conclusions that there is insufficient strength of evidence to evaluate the impact of provider type on efficacy of the intervention remain valid."
Z	3	Much of the evidence summarized in the draft qualifies as high and medium quality evidence. One example is Maglione, which is a systematic review of prospective cohort studies and therefore is high quality evidence. Maglione recommends coverage for ABA. Submitted herewith are a number of opinions from federal district and appellate courts ordering coverage. Members of the public have submitted dozens or hundreds of peer reviewed studies, all demonstrating the efficacy of ABA. All of this is high or medium quality evidence under HERC's published criteria.	See comment #H2, #J2 and #V3.

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Z	4	GRADE assesses quality of evidence based not on the specific type of evidence considered, but rather on the likelihood that future research will change the confidence in the estimation of effect. However, the Draft includes no analysis whatsoever about the effect of future research on the estimation of effect. In fact, decades of ABA research all indicates that ABA is generally effective, and future research is extremely unlikely to change confidence in the estimation of effect. Therefore, under GRADE, the quality of the evidence is high.	EbGS disagrees that the quality of evidence is high. The Warren report uses similar methodology to GRADE (described on page 27 of the report), and found the strength of evidence for children 2-12 low. The description of low strength of evidence is that further research is likely to change the confidence in the estimate of the effect and is also likely to change the estimate.
Z	5	2. HERC's Guidance Development Framework requires a recommendation of coverage for ABA for adolescents and adults. Even though Drs. Hagopian, Green, and Riechow presented evidence of the efficacy of ABA for older patients at the September meeting, the Draft mischaracterizes the evidence of efficacy for older patients as consisting of only one poorly designed case study. HERC appears to have ignored the evidence cited by these experts. If that evidence is considered, there is sufficient evidence of the efficacy of ABA to recommend coverage for patients over age 12. Additionally, HERC's Guidance Development Framework requires a recommendation of coverage regardless of the sufficiency of evidence because denying patients access to ABA results in serious disability. HERC was presented with video and testimonial evidence from a family whose daughter experienced incapacitating disability as a result of self-injurious behavior, and which was alleviated through ABA. Testimony from Dr. Hagopian also provided ample evidence that ABA is used in older patients to resolve life and health-threatening behaviors which are otherwise profoundly disabling. However, the Draft disregards that evidence without discussion. Had HERC considered that evidence, it could not have found that "clinical research study is reasonable" and its Guidance Development Framework would have directed a recommendation of coverage for older patients even in the absence of "sufficient" evidence.	See comment #H2 and #H4. While appreciated, EbGS does not consider the experience of a single individual as evidence. See evidence table and comments #H3 and #U3 for comment on Dr. Hagopian's testimony.
Z	6	3. The Draft relies exclusively on comparative effectiveness research ORS 414.701 forbids HERC from relying exclusively on comparative effectiveness research in developing coverage guidelines. Despite this specific statutory prohibition, the Draft relies exclusively on comparative effectiveness research. Moreover, even though HERC was presented with a variety of forms of evidence, the Draft includes only comparative effectiveness studies with ten or more participants, and it prioritizes studies in which participants are randomly assigned to control and study groups. In other words, it not only relies exclusively on comparative effectiveness research, it relies exclusively on a narrow category of comparative effectiveness research. Other evidence was presented to HERC in the form of extensive written and verbal testimony from ad hoc experts and	See comment #L3.

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		other witnesses. However, no mention of any of that evidence is made in the Draft, suggesting that it was ignored.	
Z	7	4. The Draft misinterprets the research ABA (as defined by SB 365), and particularly EIBI is the standard of care for children with autism. For that reason, researchers studying interventions for children with autism spectrum disorders generally compare different ABA-based interventions. They do not compare a group of children who receive ABA against a group of children who receive no intervention, and they certainly do not through random assignment to a control group deprive children of their once in a lifetime opportunity to receive ABA based early intensive intervention. This was explained to the committee, but the Draft nevertheless misinterprets many of the studies summarized as comparisons between a study group that received ABA with a control group which did not receive ABA. In reality, many of the control groups in the summarized studies received a different type of ABA-based intervention, and it is unclear that some study groups received ABA-based interventions. The draft was prepared by individuals who have no expertise in behavioral healthcare, autism, or ABA.	EbGS agrees that many of the included studies compared ABA interventions to eclectic or other interventions, including community services and speech and occupational therapies. This does not negate their findings. The evidence evaluation was based on the Warren report, which utilized a technical expert panel; see comment #N3.
AA	1	I am writing to request that you decide to have OHP cover ABA therapy for children with autism, for those under and over the age of 12, equally and fairly. They need it. My 14 year old son, Scott, has autism and PANDAS (rheumatic fever of the brain). He is verbal and needs more ABA therapy to help him socially and academically. We have been waiting to resume it until we can get insurance to cover it. We have been paying as much as we can afford to out of pocket over the years. Insurance really ought to cover it, as they cover cancer treatments for people of all ages. Children with autism, etc., under and over the age of 12 deserve good, appropriate treatment too. ABA has been proven to be an effective approach in children of all ages. We have a doctor's note saying it's medically necessary for our son. There are others in our situation who receive good ABA coverage from their insurance companies without question, especially those who work for Intel and Microsoft. I would think OHP and the remaining insurance companies who don't cover it would step up and do the same, in OR and all other states. Most states now mandate it, and I know Governor Kitzhaber signed legislation mandating coverage for it in Oregon several weeks ago. Please require that OHP cover ABA therapy for patients both under and over the age of 12. It's very important to many families in Oregon.	Thank you for your comment. *For EbGS discussion regarding extending age of treatment*
BB	1	I respectfully request that you consider additional evidence in determining the effectiveness of applied behavior analysis for treating individuals with an autism spectrum disorder (ASD). In this letter, I will summarize the limitations of primarily considering randomized controlled trials in determining the effectiveness of ABA-based interventions for this population. Thereafter, I will	Thank you for your comments.

Ident.	#	Comment	Disposition
		describe the benefits of including data on focused interventions which provide a more accurate depiction of the evidence for applied behavior analysis. Finally, I request that the HERC Committee include evidence from experts in the field of applied behavior analysis in their report.	
BB	2	**Limitations of randomized controlled trials** Although RCTs are beneficial for comparing the effects of intervention to a waitlist control group, this type of design can be challenging to use in certain populations. For example, school-age children with an ASD receive some type of intervention through their Individualized Education Plan (IEP). Because many children with an ASD are exposed to some type of behavior analytic intervention in their federally-funded educational programming (e.g., visual schedules, token reinforcement systems, functional communication training), it can be challenging to include these children in a true control group. Furthermore, there are ethical concerns related to withholding an effective intervention for children with an ASD, because IDEA mandates that children receive a free and appropriate education that includes some type of intervention. Thus, it can be challenging and unethical to arrange for a no-intervention control group for individuals with an ASD. The same considerations should be applied to certain ABA-based interventions for individuals with an ASD who would be exposed to dangerous or life-threatening symptoms if treatments were withheld. For example, adolescents who engage in severe self-injurious behavior that results in detached retinas, severe head injury, and broken bones (e.g., Kurtz et al., 2003) or life threatening feeding disorders (c.f., Kodak and Piazza, 2008) cannot be placed in a waitlist control group to evaluate the efficacy of an ABA-based, focused intervention because withholding treatment could result in further injury or death. As such, the field of applied behavior analysis relies on alternative study designs that allow for a demonstration of experimental control while minimizing the potential for harm to the participants.	EbGS acknowledges the difficulties described here. RCTs and cohort studies have been completed and are included in the evidence reviewed in the evidence evaluation. Some of these included waitlist control, others included other (eclectic) interventions. With regard to SIB, it is assumed that the control group would be treatment as usual, which is currently covered by the Prioritized List. *For EbGS discussion and discussion with experts*
BB	3	**Alternative study designs and focused interventions** Single-case designs are frequently used in the field of applied behavior analysis to demonstrate functional (causal) relationships between independent and dependent variables. Although single-case design is often mistaken for poorly designed experiments with a single participant, single-subject research methods actually provide a level of experimental rigor that exceeds those of more traditional case studies (Horner, Carr, Halle, McGee, Odum, & Wolery, 2005). Because of the rigor of single-subject research methods included in behavior-analytic studies, these methods are now published in studies in 45 professional journals across fields (American Psychological Association, 2002).	Horner reference is the one previously described in comment #F2, which suggests standards for considering an intervention evidence based.
BB	4	The extant literature on the efficacy of ABA-based interventions for individuals with an ASD using single-subject research methods is immense. For example, Matson, Benavidez, Compton, Pacwalskyj,	Thank you for providing specific references.

Ident.	#	Comment	Disposition
		and Baglio (1996) noted that there are 550 behavioral studies conducted with individuals with an ASD. To ignore this entire body of research would be tantamount to negligence. In particular, there are a plethora of studies demonstrating the effectiveness of ABA-based interventions for children and adolescents with an ASD that do not evaluate early intensive behavioral intervention (EIBI). The HERC appeared to focus the majority of their review on evidence for EIBI, despite that fact that those studies represent only a small portion of the overall body of evidence on the effectiveness of behavior analytic interventions for children with an ASD. Focused (or specific) interventions based on the principles of applied behavior analysis such as functional communication training (e.g., Tiger, Hanley, & Bruzek, 2008), choice (e.g., Fisher & Mazur, 1997), extinction (e.g., Lerman & Iwata, 1996), punishment (e.g., Lerman & Vorndran, 2002), receptive and expressive identification training (e.g., Petursdottir & Carr, 2011), and teaching joint attention and symbolic play (e.g., Dube, MacDonald, Mansfield, Holcombe, & Ahearn, 2004; Wong, 2013) to name just a few, are shown to reduce problem behavior and/or treat core symptoms associated with an ASD. I encourage the HERC to include studies using single-subject research methods in their review of the evidence for applied behavior analysis for individuals with an ASD.	Matson 1996 is not available without purchase. HERC utilized the inclusion criteria of the Warren report; see comment #N2 for rationale. Tiger 2008 is a systematic review of functional communication training with recommendations for practice. It includes 204 individuals, 81 of whom had ASD. Fisher 1997 is a narrative review of choice responding, including an evaluation of the differences between basic science, applied and bridge studies. Lerman 1996 is a narrative review of operant extinction, including both basic and applied research. Lerman 2002 is a narrative review of punishment for the treatment of behavior disorders, including both basic and applied research. Petursdottir 2011 is a narrative review of the impact of the sequencing of instruction for receptive and expressive language in EIBI. Dube 2004 is a narrative review and a “contingency analysis of gaze shift in joint attention initiation”. Wong 2013 is a RCT evaluating a classroom-based intervention and compared the order in which preschool teachers were exposed to 2 different interventions, 1 symbolic play and the other joint attention. Both were effective for increasing these attributes when compared

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			to baseline and to waitlist control.
BB	5	Focused interventions based on the principles of applied behavior analysis that use single-subject research methods to treat specific, life-threatening behavioral concerns are of critical importance to review. For example, approximately 10%-14% of individuals with mental retardation display chronic self-injurious behavior (Kurtz et al., 2003). Yet, few interventions, other than those based on applied behavior analysis, produced reductions in this severe behavior. Behavior analytic interventions based on the individual's function of self-injurious behavior have been shown to substantially reduce self-injurious behavior (e.g., Iwata et al., 1994) for individuals with developmental disabilities, including individuals with an ASD. Therefore, it is critical to include a review of focused interventions based on ABA in the HERC report.	Iwata 1994 is a consecutive case series of 152 individuals with SIB (number with ASD not specified). 74 were over aged 20 and an additional 39 were between 11 and 20. Authors analyzed reinforcing functions of SIB and concluded that functional analysis is extremely effective in identifying the environmental determinants of SIB (successful in 95% of cases) and therefore guiding treatment selection. Also reported that the interventions of extinction, differential reinforcement and punishment were effective in significantly reducing SIB in over 80% of cases. *For EbGS discussion*
BB	6	**Inclusion of information generated by experts in the field** When conducting a review of any literature base, it is beneficial to consult with experts within the field. This allows for a more thorough evaluation of all relevant evidence. Based on the evidence considered within the current HERC report, it appears that the HERC did not work with or consider the recommendations of experts within the field of behavior analysis. Had the committee done so, the immense body of missing evidence from the report would not be so evident. To correct this oversight, I urge the committee to either amend their report to include additional evidence from experts within the field of behavior analysis or include an addendum to their report with additional evidence generated by a group of experts on behavior-analytic interventions for individuals with an ASD.	See comment #N3. Topic experts were involved in creation of the Warren report, whose decision was to include SSRD, but only if it reported on at least 10 participants, which meets the evidence-based standard recommended by Horner et al. HERC has also appointed three ad hoc experts with knowledge in the areas of ABA and ASD to assist them in their evaluation.

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V	**Comprehensive Technical Reviews of Research** Mudford, L., Blampied, N., Phillips, L., Harper, D., Foster, M., Church, J., Hunt, M., Prochnow, J., Rose, D., Arnold-Saritepe, A., Peters, H., Lie, E., Jeffrey, K., Messick, E., Sumpter, C., McEwan, J., & Wilczynski S. (2009). *Technical review of published research on applied behaviour analysis interventions for people with autism spectrum disorders.* Wellington, New Zealand: Ministry of Education. Available at http://www.educationcounts.govt.nz/publications/special_education/61210/1 National Autism Center (2009). *National Standards Project Findings and Conclusions.* Randolph, MA: Author. New York State Department of Health Early Intervention Program (1999). *Clinical Practice Guideline: Autism/Pervasive Developmental Disorders--Assessment and Intervention for Young Children (Age 0-3 Years).* Health Education Services, P.O.Box 7126, Albany, NY 12224 (1999 Publication No. 4216). **Systematic Reviews, Meta-Analyses, and Other Analyses of Aggregated ABA Clinical Trials of Focused ABA Interventions** ***NOTE:*** Articles with "developmental disabilities" and "intellectual disabilities" in the titles or abstracts included studies involving participants with ASD diagnoses. **Use of a short-term inpatient model to evaluate aberrant behavior: Outcome data summaries from 1996 to 2001.** Jennifer M. Asmus, Joel E. Ringdahl, Jennifer A. Sellers, Nathan A. Call, Marc S. Andelman, and David P. Wacker, The University Of Iowa *Journal of Applied Behavior Analysis* (2004) *37* 283–304 **A review of behavioral interventions for the treatment of aggression in individuals with developmental disabilities.** Julie Brosnan and Olive Healy, National University of Ireland, Galway, Ireland *Research in Developmental Disabilities 32* (2011) 437–446 Aggression can present as a significant problem behavior in individuals with a diagnosis of developmental disability. Much research has focused on the prevalence of aggression in individuals with varying degrees of severity of intellectual disability (AD), autism spectrum disorders (ASD) and co-morbidity of ID and ASD. Research has also focused on the impact of aggressive behavior on individuals' development including cognitive, adaptive and social functioning. The literature on Applied Behavior Analysis provides abundant examples of various interventions that are effective in reducing or eliminating aggressive behavior across a range of ages and degrees of developmental disabilities. Many interventions report success using antecedent alterations, reinforcement-based strategies and consequence manipulations. The current review provides a focused, comprehensive examination of aggressive behavior intervention research for individuals with developmental disabilities aged 3–18 years published between 1980 and 2009. **Efficacy of behavioral interventions for reducing problem behavior in persons with autism: A quantitative synthesis of single-subject research.** Jonathan M. Campbell, Department of Psychology, University of Memphis, Memphis, TN, USA *Research in Developmental Disabilities 24* (2003) 120-138 The efficacy of behavioral interventions for problem behavior in persons with autism was reviewed. One hundred and seventeen published articles representing 181 individuals with autism were examined. Articles were selected from 15 journals. Participant, treatment, and experimental variables were evaluated. Three effect sizes were calculated for each article. Behavioral treatments are effective in reducing problematic behaviors in individuals with autism. Type of target behavior and type of treatment did not moderate the average effect of treatment. As measured by percentage of zero data (PZD), three variables were predictive of behavioral suppression beyond that accounted for by behavioral topography and treatment type. Reliability of observation and number of treatment data points were positively related to PZD scores. Treatments based on experimental functional analysis (EFA) produced higher average PZD scores than treatments that did not include an EFA. The implications of the findings, study limitations, and suggestions for

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	future research are discussed. **A review of research on procedures for teaching safety skills to persons with developmental disabilities.** Dennis R. Dixon, Ryan Bergstrom, Marlena N. Smith, and Jonathan Tarbox, Center for Autism and Related Disorders, United States *Research in Developmental Disabilities 31* (2010) 985–994 Safety skills are an important but often neglected area of training for persons with developmental disabilities (DD). The present study reviewed the literature on teaching safety skills to persons with DD. Safety skills involve a variety of behaviors such as knowing how to cross the street or what to do in case of a house fire. A number of studies have been conducted on teaching these skills to individuals with DD. The studies reviewed have varying degrees of success and demonstrate varying degrees of generalization, but the general finding has been that prompting, reinforcement, and role-playing are effective teaching procedures across a variety of participants, skills, and settings. **Communication intervention for children with autism: A review of treatment efficacy** Howard Goldstein, Florida State University.*Journal of Autism and Developmental Disorders* (2002) *32* 373-396 Empirical studies evaluating speech and language intervention procedures applied to children with autism are reviewed, and the documented benefits are summarized. In particular, interventions incorporating sign language, discrete trial training, and milieu teaching procedures have been used successfully to expand the communication repertoires of children with autism. Other important developments in the field stem from interventions designed to replace challenging behaviors and to promote social and scripted interactions. The few parent and classroom training studies that included language measures also are analyzed. This article seeks to outline the extent to which previous research has helped identify a compendium of effective instructional practices that can guide clinical practice. It also seeks to highlight needs for further research to refine and extend current treatment approaches and to investigate more comprehensive treatment packages. **Initial functional analysis outcomes and modifications in pursuit of differentiation: A summary of 176 inpatient cases.** Louis P. Hagopian, Griffin W. Rooker, Joshua Jessel, and Iser G. Deleon, Kennedy Krieger Institute and Johns Hopkins University School Of Medicine *Journal of Applied Behavior Analysis* (2013) *46* 88–100 The functional analysis (FA) described by Iwata, Dorsey, Slifer, Bauman, and Richman (1982/1994) delineated not only a set a specific procedures, but also a model that involves the use of analogue conditions wherein antecedent and consequent variables are systematically manipulated. This consecutive caseseries analysis describes FAs of 176 individuals with intellectual disabilities who had been admitted to an inpatient unit for severe problem behavior. Following an initial standardized FA, additional modifications were performed in pursuit of differentiation. Ultimately, a function was identified in 86.9% of the 176 cases and in 93.3% of the 161 cases for which the FA, if necessary, was modified up to 2 times. All modifications were documented and classified as involving changes to antecedents, consequences, or design (or some combination of these). Outcomes for each type of modification are reported. The results support the utility of ongoing hypothesis testing through individualized modifications to FA procedures, and provide information regarding how each type of modification affected results. **Identifying empirically supported treatments for pica in individuals with intellectual disabilities.** Louis P. Hagopian, Griffin W. Rooker, and Natalie U. Rolider, The Kennedy Krieger Institute, Johns Hopkins University School of Medicine *Research in Developmental Disabilities 32* (2011) 2114–2120 The purpose of the current study was to critically examine the existing literature on the treatment of pica displayed by individuals with intellectual disabilities. Criteria for empirically supported treatments as described by Divisions 12 and 16 of APA, and adapted for studies employing single-case designs were used to review this body of literature. A total of 34 treatment studies were identified, 25 of which were well designed and reported at least an 80% reduction in pica (21 studies reported 90% or greater reduction in pica). Results indicated that behavioral treatments in general, and treatments involving the combination of reinforcement and response reduction procedures in particular, can be designated as well-established treatments for pica exhibited by

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	individuals with intellectual disabilities. **A multilevel meta-analysis of single-case and small-n research on interventions for reducing challenging behavior in persons with intellectual disabilities** M. Heyvaert , B. Maes, W. Van den Noortgate, S. Kuppens, and P. Onghena, Faculty of Psychology and Educational Sciences, Katholieke Universiteit Leuven, Belgium *Research in Developmental Disabilities 33* (2012) 766–780 The effectiveness of different interventions for challenging behavior (CB) in persons with intellectual disabilities (ID) was reviewed by means of a two-phase study. First, a systematic review of 137 meta-analyses and reviews on group study interventions for CB in persons with ID was conducted. Based on this review, hypotheses concerning the effectiveness of divergent interventions for CB and concerning the impact of variables moderating treatment effectiveness were systematically generated. Second, these hypotheses were tested by means of a multilevel meta-analysis of single-case and small-n research. Two hundred and eighty-five studies reporting on 598 individuals were examined. The average treatment effect was large and statistically significant. However, this effect varied significantly over the included studies and participants. Compared to the meta-analyses and reviews focusing on group-studies in this research domain, the results of the present multilevel meta-analysis of single-case and small-n intervention research provided more detailed knowledge on which specific CB and intervention components moderate the interventions' effectiveness. **Identifying empirically supported treatments for phobic avoidance in individuals with intellectual disabilities.** Heather K. Jennett and Louis P. Hagopian, Kennedy Krieger Institute and Johns Hopkins School of Medicine *Behavior Therapy 39* (2008) 151–161 This paper reviews the literature regarding the treatment of phobic avoidance in individuals with intellectual disabilities. Criteria for classifying interventions as empirically supported, developed by the American Psychological Association (APA) Division 12 Task Force on Promotion and Dissemination of Psychological Procedures, were used. For studies employing single case experimental designs, criteria developed by APA Division 16 (Kratochwill & Stoiber, 2002; Shernoff, Kratochwill,& Stoiber, 2002) were used to supplement Division 12 criteria. Results indicate that behavioral treatment can be designated as a well established treatment for phobic avoidance in individuals with intellectual disabilities. **An analysis of functional communication training as an empirically supported treatment for problem behavior displayed by individuals with intellectual disabilities.** Patricia F. Kurtz a,b,*, Eric W. Boelter c, David P. Jarmolowicz d, Michelle D. China, Louis P. Hagopian a,b a Kennedy Krieger Institute, United States b The Johns Hopkins University School of Medicine, United States c Seattle Children's Autism Center, United States d Virginia Tech Carilion Research Institute, United States *Research in Developmental Disabilities 32* (2011) 2935–2942 This paper examines the literature on the use of functional communication training (FCT) as a treatment for problem behavior displayed by individuals with intellectual disabilities (ID). Criteria for empirically supported treatments developed by Divisions 12 and 16 of the American Psychological Association (Kratochwill & Stoiber, 2002; Task Force, 1995) and adapted by Jennett and Hagopian (2008) for evaluation of single-case research studies were used to examine the support for FCT. Results indicated that FCT far exceeds criteria to be designated as a well-established treatment for problem behavior exhibited by children with ID and children with autism spectrum disorder, and can be characterized as probably efficacious with adults. **Treatment of elopement in individuals with developmental disabilities: A systematic review.** Russell Lang a, Mandy Rispoli a, Wendy Machalicek b, Pamela J. White a, Soyeon Kang a, Nigel Pierce a, Austin Mulloy a, Tina Fragale a, Mark O'Reilly a, Jeff Sigafoos c, Giulio Lancioni d a The Meadows Center for Preventing Educational Risk, The University of Texas at Austin, Austin, TX, USA b Portland State University, Portland, Oregon, USA c Victoria University of Wellington, New Zealand d University of Bari, Italy *Research in Developmental Disabilities 30* (2009) 670–681 We reviewed studies involving the treatment of elopement in individuals with developmental disabilities. Systematic searches of three electronic databases, journals, and reference lists identified 10 studies meeting the inclusion criteria. These studies were evaluated in terms of: (a) participants, (b) procedures used to assess elopement, (c) intervention procedures, (d) results of the intervention, and (e) certainty of evidence. Across the 10 studies, intervention was

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	provided to a total of 53 participants aged 3–47 years. Assessment procedures included anecdotal staff reports, participant interviews, direct observation, and modified analog functional analysis. Intervention approaches included differential reinforcement, extinction, functional communication training, response blocking, non-contingent reinforcement, shaping, and scheduled exercise. Positive outcomes were reported in 80% of the reviewed studies. The evidence base suggests that function-based assessment (e.g. functional analysis procedures) and function-based treatments (e.g. functional communication training) may be most effective in the treatment of elopement. **Evidence to practice: Treatment of anxiety in individuals with autism spectrum disorders.** Russell Lang, Richard Mahoney, Farah El Zein, Elizabeth Delaune, and Megan Amidon, Texas State University-San Marcos, TX, USA *Neuropsychiatric Disease and Treatment* (2011*) 7* 27–30 Clinical question: What treatment improves social interactions and reducesreports of anxiety symptoms in individuals with autism spectrum disorders (ASD) and a co-occurring anxiety disorder? Results: Systematic reviews and randomized clinical trials suggest that cognitive behavior therapy in tandem with direct instruction of social skills using applied behavior analysis intervention components may be effective for treating anxiety in individuals with high functioning ASD. For individuals with ASD, an anxiety disorder, and an intellectual disability, systematic desensitization may be effective. Implementation: Intervention should emphasize teaching social skills. Reinforcers (i.e., rewards based upon the client's interests) should be used to encourage participation in therapy. Treatment should incorporate visual aides and family involvement. Intervention components involving abstract concepts, visualization, and discussions of emotions are less useful given difficulties in abstract reasoning and communication inherent to ASD. **The effectiveness of intervention on the behavior of individuals with autism: A meta-analysis using percentage of data points exceeding the median of baseline phase (PEM).** Hsen-Hsing Ma, National Chengchi University, Taiwan *Behavior Modification* (2009) *33* 339-359 The aim of the present study is to demonstrate the percentage of data points exceeding the median of baseline phase (PEM) approach using data on autism treatment for illustrative purposes to compare the effectiveness of different interventions on the problem behaviors of individuals with autism. Electronic databases such as The ProQuest and Google were searched. A total of 163 articles were located, producing 1,502 effect sizes. The results demonstrate that five highly effective intervention strategies were priming, self-control, training, positive reinforcement and punishment, and presenting preferential activities. The least effective strategy was to teach perspective taking skills. The PEM approach is recommended for use in meta-analysis for single case experimental designs. **Social skills interventions for individuals with autism: Evaluation for evidence-based practices within a best evidence synthesis framework.** Brian Reichow and Fred R. Volkmar, Yale University Child Study Center. *Journal of Autism and Developmental Disorders* (2010) *40* 149–166 This paper presents a best evidence synthesis of interventions to increase social behavior for individuals with autism. Sixty-six studies published in peer-reviewed journals between 2001 and July 2008 with 513 participants were included. The results are presented by the age of the individual receiving intervention and by delivery agent of intervention. The findings suggest there is much empirical evidence supporting many different treatments for the social deficits of individuals with autism. Using the criteria of evidence-based practice proposed by Reichow et al. (Journal of Autism and Developmental Disorders, 38:1311– 1318, 2008), social skills groups and video modeling have accumulated the evidence necessary for the classifications of established EBP and promising EBP, respectively. Recommendations for practice and areas of future research are provided. **Meta-analyses of Studies of Bona Fide Early Intensive ABA Intervention Meta-analysis of early intensive behavioral intervention for children with autism.** Sigmund Eldevik, School of Psychology, Bangor University; Faculty of Behavioral Science, Akershus University College; and Highfield Centre Richard P. Hastings and J. Carl Hughes, School of Psychology, Bangor University Erik Jahr, Akershus University Hospital Svein Eikeseth, Faculty of Behavioral Science, Akershus University College Scott Cross, Lovaas Institute for Early Intervention *Journal of Clinical Child & Adolescent Psychology* (2009) *38* 439–450 A systematic literature search for studies reporting effects of Early Intensive Behavioral Intervention identified 34 studies, 9 of which were controlled

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	designs having either a comparison or a control group. We completed a meta-analysis yielding a standardized mean difference effect size for two available outcome measures: change in full-scale intelligence and/or adaptive behavior composite. Effect sizes were computed using Hedges's g. The average effect size was 1.10 for change in full-scale intelligence (95% confidence interval, .87, 1.34) and .66 (95% confidence interval, .41, .90) for change in adaptive behavior composite. These effect sizes are generally considered to be large and moderate, respectively. Our results support the clinical implication that at present, and in the absence of other interventions with established efficacy, Early Intensive Behavioral Intervention should be an intervention of choice for children with autism. **Using participant data to extend the evidence base for intensive behavioral intervention for children with autism.** Sigmund Eldevik, Akershus University College, Lillestrom, Norway Richard P. Hastings and J. Carl Hughes, Bangor University, Bangor, Wales Erik Jahr, Akershus University Hospital, Lorenskog, Norway Svein Eikeseth, Akershus University College, Lillestrom, Norway Scott Cross, Lovaas Institute for Early Intervention, Culver City, CA, USA. *American Journal on Intellectual and Developmental Disabilities* (2010) *115* 381–405 We gathered individual participant data from 16 group design studies on behavioral intervention for children with autism. In these studies, 309 children received behavioral intervention, 39 received comparison interventions, and 105 were in a control group. More children who underwent behavioral intervention achieved reliable change in IQ (29.8%) compared with 2.6% and 8.7% for comparison and control groups, respectively, and reliable change in adaptive behavior was achieved for 20.6% versus 5.7% and 5.1%, respectively. These results equated to a number needed to treat of 5 for IQ and 7 for adaptive behavior and absolute risk reduction of 23% and 16%, respectively. Within the behavioral intervention sample, IQ and adaptive behavior at intake predicted gains in adaptive behavior. Intensity of intervention predicted gains in both IQ and adaptive behavior.
X, Y	Asmus, J. M., Ringdahl, J. E., Sellers, J. A., Call, N. A., Andelman, M. S., & Wacker, D. P. (2004). Use of a short-term inpatient model to evaluate aberrant behavior: Outcome data summaries from 1996 to 2001. *Journal of Applied Behavior Analysis*, *37,* 283–304. Brosnan, J., & Healy, O. (2011). A review of behavioral interventions for the treatment of aggression in individuals with developmental disabilities. *Research in Developmental Disabilities, 32*, 437–446. Campbell, J. M. (2003). Efficacy of behavioral interventions for reducing problem behavior in persons with autism: A quantitative synthesis of single-subject research. *Research in Developmental Disabilities, 24,* 120-138. Dixon, D. R., Bergstrom, R. Smith, M. N., & Tarbox, J. (2010). A review of research on procedures for teaching safety skills to persons with developmental disabilities. *Research in Developmental Disabilities, 31,* 985–994. Eldevik, S., Hastings, R. P., Hughes, J. C., Jahr, E., Eikeseth, S., & Cross, S. (2010). Using participant data to extend the evidence base for intensive behavioral intervention for children with autism. *American Journal on Intellectual and Developmental Disabilities, 115,* 381–405. Eldevik, S., Hastings, R. P., Hughes, J. C., Jahr, E., Eikeseth, S., & Cross, S. (2009). Meta-analysis of early intensive behavioral intervention for children with autism. *Journal of Clinical Child & Adolescent Psychology, 38,* 439–450. Goldstein, H. (2002). Communication intervention for children with autism: A review of treatment efficacy. *Journal of Autism and Developmental Disorders, 32,* 373-396. Hagopian, L. P., Rooker, G. W., Jessel, J., & Deleon, I. G. (2013) Initial functional analysis outcomes and modifications in pursuit of differentiation: A summary of 176 inpatient cases. *Journal of Applied Behavior Analysis*, *46,* 88–100. Hagopian, L. P., Rooker, G. W., & Rolider, N. U. (2011). Identifying empirically supported treatments for pica in individuals with intellectual disabilities. *Research in Developmental Disabilities, 32,* 2114–2120. Heyvaert, M., Maes, B., Van den Noortgate, W., Kuppens, S., & Onghena, P. (2012). A multilevel meta-analysis of single-case and small-n research on interventions

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BB	American Psychological Association (2002). Criteria for evaluating treatment guidelines. *American Psychologist, 57,* 1052-1059. Dube, W. V., MacDonald, R. P. F., Mansfield, R. C., Holcomb, W., & Ahearn, W. H. (2004). Toward a behavioral analysis of joint attention. *The Behavior Analyst, 27,* 197-207. Fisher, W. W., & Mazur, J. E. (1997). Basic and applied research on choice responding. *Journal of Applied Behavior Analysis, 30,* 387-410. Horner, R. H., Carr, E. G., Halle, J., McGee, G., Odom, S., & Wolery, M. (2005). The use of single-subject research to identify evidence-based practice in special education. *Exceptional Children, 71,* 165-179. Iwata, B. A., Pace, G. M., Dorsey, M. F., Zarcone, J. R., Vollmer, T. R., Smith, R. G. et al. (1994). The functions of self-injurious behavior: An experimental-epidemiological analysis. *Journal of Applied Behavior Analysis, 27,* 215-240. Kodak, T., & Piazza, C. C. (2008). Assessment and treatment of feeding and sleeping disorders in children diagnosed with developmental disabilities. *Child and Adolescent Psychiatric Clinics of North America, 17,* 887-906. Kurtz, P. F., Chin, M. D., Huete, J. M., Tarbox, R. S. F., O'Conner, J. T., Paclawskyj, T., & Rush, K. S. (2003). Functional analysis and treatment of self-injurious behavior in young children: A summary of 30 cases. *Journal of Applied Behavior Analysis, 36,* 205-219. Lerman, D. C., & Iwata, B. A. (1996). Developing a technology for the use of operant extinction in clinical settings: An examination of basic and applied research.

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Dr. Brian Reichow, Ph.D., BCBA-D, Yale Child Study Center, AJ Pappanikou Center for Excellence in Developmental Disabilities	• Reichow B, Barton EE, Boyd BA, Hume K. Early intensive behavioral intervention (EIBI) for young children with autism spectrum disorders (ASD). Cochrane Database of Systematic Reviews 2012, Issue 10. Art. No.: CD009260. DOI: 10.1002/14651858.CD009260.pub2. • Sackett et al., 1995
Dr. Louis P. Hagopian, Ph.D., BCBA-D Johns Hopkins University School of Medicine; Kennedy Krieger Institute	• Didden et al., (1997) • Campbell (2003) • Hanley et al., 2003 • Iwata et al., 1994, FBA of self-injury • Mueller, et al., 2001, FBA in school • Hagopian et al., 2013, FBA of problem behavior • Kahng, S., Iwata, B. A., & Lewin, A. B. (2002). Behavioral Treatment of Self-Injury, 1964 to 2000. American Journal on Mental Retardation, 107, 212-221. • Campbell et al., 2003 • Harvey et al., 2009. Updating a meta-analysis of intervention research with challenging behaviour: Treatment validity and standards of practice. Journal of Intellectual and Developmental Disability, 34, 67–80 • Kurtz et al., 2011. An analysis of functional communication training as an empirically supported treatment for problem behavior displayed by individuals with intellectual disabilities. *Research in developmental disabilities* ;32(6):2935-42. • Carr JE, Severtson JM, Lepper TL. (2009). Noncontingent reinforcement is an empirically supported treatment for problem behavior exhibited by

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Detailed Review of Selected Single Subject Research Design Citations

Provided By Public Comment on the Evaluation of Evidence: ABA for ASD

Given that the focus of most of the public comment pertained to requesting that ABA be recommended for coverage in individuals over age 12, detailed review of citations was limited to those studies. A random sample of 10% of SSRD study types (60 total) were reviewed in additional detail. In addition, all systematic reviews and meta-analyses of SSRDs were reviewed in more detail. Those findings are presented below:

Single Subject Research Design

- Baer, D.M. & Guess, D. (1971). Receptive training of adjectival inflections in mental retardates. Journal of Applied Behavior Analysis, 4, 129-139.
    - Population: 3 “institutional retardates” ages 7-13
    - Outcome of interest: use of the “er” and “est” suffixes to describe superlative relationships (language training)
    - Intervention: Differential reinforcement
    - Setting: institution
- Haring, T.G., & Breen, C.G. (1992). A peer-mediated social network intervention to enhance the social integration of persons with moderate and severe disabilities. Journal of Applied Behavior Analysis, 25, 319-333.
    - Population: 2 13-year-olds with moderate to severe disability (1 with autism, 1 mentally retarded)
    - Outcome of interest: frequency and appropriateness of social interactions in the school setting
    - Intervention: social network intervention (peer-mediated)
    - Setting: school
- Rodgers, T.A., & Iwata, B.A. (1991). An analysis of error-correction procedures during discrimination training. Journal of Applied Behavior Analysis, 24, 775-782.
    - Population: 7 developmentally delayed (severe or profound) subjects, ages 26-43 (no mention of autism)
    - Outcome of interest: identity matching (correctly matching one symbol to another)
    - Intervention: discrimination training (differential reinforcement, repetition, avoidance)
    - Setting: institution
- Valentino, A.L., Shillingsburg, M.A., & Call, N.A. (2012). Comparing the effects of echoic prompts and echoic prompts plus modeled prompts on intraverbal behavior. Journal of Applied Behavior Analysis, 45, 431-435.
    - Population: 1 individual diagnosed with Downs syndrome and autism, aged 13
    - Outcome of interest: vocal intraverbal responses
    - Intervention: echoic prompts compared to echoic prompts plus sign language
    - Setting: classroom
- Krantz, P.J., Zalenski, S., Hall, L.J., Fenske, E.C., & McClannahan, L.E. (1981). Teaching complex language to autistic children. Analysis and Intervention in Developmental Disabilities. 1, 259-297.
    - Population: 9 individuals diagnosed with ASD, ages 5 - 13
    - Outcome of interest: development of “complex” language

- Intervention: 3 different language interventions utilizing a multiple baseline design:
  - Teaching to increase of language complexity (label, color and label, shape/size, color and label, verb + previous)
  - teaching answers to WH-concepts (who, what, why, where, how)
  - teaching answers to temporally remote events using "paragraphic speech"
- Setting: special education classroom and the home

· Piazza, C.C., & Fisher, W. (1991). A faded bedtime with response cost protocol for treatment of multiple sleep problems in children. Journal of Applied Behavior Analysis. 24, 129-140.
- Population: 4 developmentally delayed individuals referred for self-injury, in an inpatient setting, with associated insomnia, ages 3 - 19
- Outcome of interest: bedtimes, duration of sleep
- Intervention: faded bedtime procedure with response cost
- Setting: inpatient

Summary

Of the studies examined, 3 (50%) made no mention of autism. With regard to setting, 3 (50%) were in the school/educational setting and 3 (50%) were in an institutional or inpatient setting.

Meta-analyses or Systematic Reviews that include SSRD Studies

"National Professional Development Center for ASD: Wong, C., Odom, S. L., Hume, K. Cox, A. W., Fettig, A., Kucharczyk, S., … Schultz, T. R. (2013). Evidence-based practices for children, youth, and young adults with Autism Spectrum Disorder. Chapel Hill: The University of North Carolina, Frank Porter Graham Child Development Institute, Autism Evidence-Based Practice Review Group."

Funded by the US Department of Education, limited to evaluation of focused interventions, described as:

> "practices … designed to address a single skill or goal of a student with ASD (Odom et al., 2010). These practices are operationally defined, address specific learner outcomes, and tend to occur over a shorter time period than comprehensive treatment models (i.e., until the individual goal is achieved). Examples include discrete trial teaching, pivotal response training, prompting, and video modeling. Focused intervention practices could be considered the building blocks of educational programs for children and youth with ASD."

Population: Aged 0-22 years with ASD
Interventions: focused behavioral, developmental and educational interventions
Study design: experimental design, including SSRD (withdrawal of treatment, multiple baseline, multiple probe, alternating treatment, changing criterion designs)
Search dates: 1990-2011
Total evidence base: 456 articles

Criteria for designation of evidence-based:

(a) two high quality experimental or quasi-experimental design studies conducted by two different research groups, or (b) five high quality single case design studies conducted by three different research groups and involving a total of 20 participants across studies, or (c) there is a combination of research designs that must include at least one high quality experimental/quasi-experimental design, three high quality single case designs, and be conducted by more than one researcher or research group

Results: The 27 practices that met criteria for being evidence based are presented in the table below, along with the number and type of studies:

Evidence-Based Practice	Definition	Empirical Support	
		Group (n)	Single Case (n)
Antecedent-based intervention (ABI)	Arrangement of events or circumstances that precede the occurrence of an interfering behavior and designed to lead to the reduction of the behavior.	0	32
Cognitive behavioral intervention (CBI)	Instruction on management or control of cognitive processes that lead to changes in overt behavior.	3	1
Differential reinforcement of Alternative, Incompatible, or Other Behavior (DRA/I/O)	Provision of positive/desirable consequences for behaviors or their absence that reduce the occurrence of an undesirable behavior. Reinforcement provided: a) when the learner is engaging in a specific desired behavior other than the inappropriate behavior (DRA), b) when the learner is engaging in a behavior that is physically impossible to do while exhibiting the inappropriate behavior (DRI), or c) when the learner is not engaging in the interfering behavior (DRO) .	0	26
Discrete trial teaching (DTT)	Instructional process usually involving one teacher/service provider and one student/client and designed to teach appropriate behavior or skills . Instruction usually involves massed trials. Each trial consists of the teacher's instruction/presentation, the child's response, a carefully planned consequence, and a pause prior to presenting the next instruction.	0	13
Exercise (ECE)	Increase in physical exertion as a means of reducing problem behaviors or increasing appropriate behavior.	3	3
Extinction (EXT)	Withdrawal or removal of reinforcers of interfering behavior in order to reduce the occurrence of that behavior. Although sometimes used as a single intervention practice, extinction often occurs in combination with functional behavior assessment, functional communication training, and differential reinforcement.	0	11
Functional behavior assessment (FBA)	Systematic collection of information about an interfering behavior designed to identify functional contingencies that support the behavior . FBA consists of describing the interfering or problem behavior, identifying antecedent or	0	10

Detailed Review of Selected Single Subject Research Design Citations

Evidence-Based Practice	Definition	Empirical Support	
		Group (n)	Single Case (n)
	consequent events that control the behavior, developing a hypothesis of the function of the behavior, and/or testing the hypothesis.		
Functional communication training (FCT)	Replacement of interfering behavior that has a communication function with more appropriate communication that accomplishes the same function. FCT usually includes FBA, DRA, and/ or EX.	0	12
Modeling (MD)	Demonstration of a desired target behavior that results in imitation of the behavior by the learner and that leads to the acquisition of the imitated behavior. This EBP is often combined with other strategies such as prompting and reinforcement.	1	4
Naturalistic intervention (NI)	Intervention strategies that occur within the typical setting/activities/routines in which the learner participates . Teachers/service providers establish the learner's interest in a learning event through arrangement of the setting/activity/routine, provide necessary support for the learner to engage in the targeted behavior, elaborate on the behavior when it occurs, and/or arrange natural consequences for the targeted behavior or skills.	0	10
Parent-implemented intervention (PII)	Parents provide individualized intervention to their child to improve/increase a wide variety of skills and/or to reduce interfering behaviors. Parents learn to deliver interventions in their home and/or community through a structured parent training program .	8	12
Peer-mediated instruction and intervention (PMII)	Typically developing peers interact with and/or help children and youth with ASD to acquire new behavior, communication, and social skills by increasing social and learning opportunities within natural environments. Teachers/service providers systematically teach peers strategies for engaging children and youth with ASD in positive and extended social interactions in both teacher-directed and learner-initiated activities.	0	15
Picture Exchange Communication System (PECS)	Learners are initially taught to give a picture of a desired item to a communicative partner in exchange for the desired item. PECS consists of six phases which are: (1) "how" to communicate, (2) distance and persistence, (3) picture discrimination, (4) sentence structure, (5) responsive requesting, and (6) commenting.	2	4
Pivotal response training (PRT)	Pivotal learning variables (i.e., motivation, responding to multiple cues, self-management, and self-initiations) guide intervention practices that are implemented in settings that build on learner interests and initiative.	1	7
Prompting (PP)	Verbal, gestural, or physical assistance given to learners to assist them in acquiring or engaging in a targeted behavior or skill. Prompts are generally given by an adult or peer before or as a learner attempts to use a skill.	1	32
Reinforcement (R+)	An event, activity, or other circumstance occurring after a learner engages in a desired behavior that leads to the increased occurrence of the behavior in the future.	0	43

Detailed Review of Selected Single Subject Research Design Citations

Evidence-Based Practice	Definition	Empirical Support	
		Group (n)	Single Case (n)
Response interruption/ redirection (RIR)	Introduction of a prompt, comment, or other distracters when an interfering behavior is occur- ring that is designed to divert the learner's attention away from the interfering behavior and results in its reduction.	0	10
Scripting (SC)	A verbal and/or written description about a specific skill or situation that serves as a model for the learner. Scripts are usually practiced repeatedly before the skill is used in the actual situation.	1	8
Self-management (SM)	Instruction focusing on learners discriminating between appropriate and inappropriate behaviors, accurately monitoring and recording their own behaviors, and rewarding themselves for behaving appropriately.	0	10
Social narratives (SN)	Narratives that describe social situations in some detail by highlighting relevant cues and offering examples of appropriate responding. Social narratives are individualized according to learner needs and typically are quite short, perhaps including pictures or other visual aids.	0	17
Social skills training (SST)	Group or individual instruction designed to teach learners with autism spectrum disorders (ASD) ways to appropriately interact with peers, adults, and other individuals. Most social skill meetings include instruction on basic concepts, role-playing or practice, and feedback to help learners with ASD acquire and practice communication, play, or social skills to promote positive interactions with peers.	7	8
Structured play group (SPG)	Small group activities characterized by their occurrences in a defined area and with a defined activity, the specific selection of typically developing peers to be in the group, a clear delineation of theme and roles by adult leading, prompting, or scaffolding as needed to support students' performance related to the goals of the activity.	2	2
Task analysis (TA)	A process in which an activity or behavior is divided into small, manageable steps in order to assess and teach the skill. Other practices, such as reinforcement, video modeling, or time delay, are often used to facilitate acquisition of the smaller steps.	0	8
Technology-aided instruction and intervention (TAII)	Instruction or interventions in which technology is the central feature supporting the acquisition of a goal for the learner. Technology is defined as "any electronic item/ equipment/ application/or virtual network that is used intentionally to increase/maintain, and/or improve daily living, work/productivity, and recreation/leisure capabilities of adolescents with autism spectrum disorders"(Odom, Thompson, et al ., 2013).	9	11
Time delay (TD)	In a setting or activity in which a learner should engage in a behavior or skill, a brief delay occurs between the opportunity to use the skill and any additional instructions or prompts. The purpose of the time delay is to allow the learner to respond without having to receive a prompt and thus focuses on fading the use of prompts during instructional activities.	0	12

Evidence-Based Practice	Definition	Empirical Support	
		Group (n)	Single Case (n)
Video modeling (VM)	A visual model of the targeted behavior or skill (typically in the behavior, communication, play, or social domains), provided via video recording and display equipment to assist learning in or engaging in a desired behavior or skill.	1	31
Visual support (VS)	Any visual display that supports the learner engaging in a desired behavior or skills independent of prompts. Examples of visual supports include pictures, written words, objects within the environment, arrangement of the environment or visual boundaries, schedules, maps, labels, organization systems, and timelines.	0	18

Those that were found to be evidence-based and included individuals aged 15-22 were the following:

- Antecedent-based Intervention
- Modeling
- Peer Mediated Instruction and Intervention
- Reinforcement
- Scripting
- Social Skills Training
- Technology-aided Instruction and Intervention
- Video Modeling
- Visual Support

No report or comment made pertaining to intensity, duration or persistence.

Reichow, B. and Fred R. Volkmar, "Social Skills Interventions for Individuals with Autism: Evaluation for Evidence-Based Practices within a Best Evidence Synthesis Framework." J Autism Dev Disord (2010) 40:149–166.

See public comment disposition document, comment #M4

Density reported for all included studies. For the 3 studies that included only adolescents and adults, frequency ranged from at least 15 minutes 4 times/week to 120 minutes/week to 15 minutes, 10 times/week. Duration ranged from 4 to 16 weeks.

These authors state that there are no methods for estimating publication bias for SSRD.

New Zealand Guidelines Group. The effectiveness of applied behaviour analysis interventions for people with autism spectrum disorder. Systematic Review. Wellington; 2008.

See public comment disposition document, comment #I3

This review included the same two studies included in Warren evaluating treatment intensity (Smith 2000, Reed 2007). Both addressed EIBI in young children.

Lang, R., Rispoli, M., Machalicek, W., White, P. J., Kang, S., Pierce, N., Mulloy, A., Fragale, T., O'Reilly, M., Sigafoos, J., & Lancioni, G. (2009). Treatment of elopement in individuals with developmental disabilities: A systematic review. Research in Developmental Disabilities, 30, 670–681.

Population: Ages 3-47 years, developmentally disabled
Interventions: Any intervention targeted to prevention of elopement
Study design: 5 experimental design, including SSRD, 5 non-experimental
Search dates: not restricted - 2008
Total evidence base: 10 studies, total N = 53, 6 with ASD
Results: 80% of the studies reviewed reported positive results, however only two studies reported the complete elimination elopement

No comment in report pertaining to intensity, duration or persistence, however, a typical intervention is described as follows:

"Intervention initially contained 3 components. (1) No car rides following elopement and return to residential center with minimal attention. (2) During work times praise participant every 15 min and give breaks in which preferred items are available. (3) Reinforce with a car ride following periods without elopement. After implementation 2 modifications were made. (1) More regular car rides with staff and (2) Teaching participant to respond ''Don't run away'' when asked how he can earn car rides."

Kurtz, P. F., Boelter, E. W., Jarmolowicz, D. P., Chin, M. D., & Hagopian, L. P. (2011). An analysis of functional communication training as an empirically supported treatment for problem behavior displayed by individuals with intellectual disabilities. Research in Developmental Disabilities, 32, 2935–2942.

Population: Ages not specified, individuals with intellectual disabilities with any problem behavior
Interventions: Functional communication training "a function-based differential reinforcement procedure that involves teaching the individual to use an appropriate communication response to access the reinforcer responsible for maintaining problem behavior"
Study design: SSRD
Search dates: 1985 - 2009
Total evidence base: 28 studies, total N = 80, 23 with ASD, 11 in adolescents, 9 in adults
Results: Not provided. A count of the number of studies was presented to demonstrate that FCT meets "well-established" standards (at least 10 studies) for children and adolescents, but not adults (meets "probably efficacious" standard)

No report or comment made pertaining to intensity, duration or persistence.

Lang, R., Regester, A., Lauderdale, S., Ashbaugh, K., & Haring, A. (2010). Treatment of anxiety in autism spectrum disorders using cognitive behaviour therapy: a systematic review. Developmental Neurorehabilitation, 13, 53–63.

Does not pertain to ABA

Brosnan, J., & Healy, O. (2011). A review of behavioral interventions for the treatment of aggression in individuals with developmental disabilities. Research in Developmental Disabilities, 32, 437–446.

Population: Ages 3 – 18 diagnosed with ASD or intellectual disability
Interventions: Any intervention used to reduce aggressive behavior (antecedent manipulations, reinforcement based strategies, consequential control)
Study design: SSRD
Search dates: 1980 - 2009
Total evidence base: 18 studies, total N = 31, 17 with ASD, 5 aged 13 - 18
Results: All of the studies reported decreases in challenging behavior attributed to the intervention. Of the studies included, seven reported total or near elimination of aggression of at least one individual during intervention in at least one condition. Antecedent manipulations, changes in instructional context, reinforcement-based strategies, and behavior reduction strategies each appear to be effective in reducing the occurrence of aggression. Limited conclusions may be drawn regarding the permanency of treatment gains as only four of the studies conducted follow-up assessments. However, each of these studies reported that treatment gains were maintained.

Of the 18 studies included, 4 reported on follow up (time elapsed not specified), and all 4 studies reported that aggressive behaviors were maintained at the same (low) level as at the end of the intervention. No report on intensity or duration.

Hanley, G., Iwata, B.A., & McCord, B.E. (2003). Functional analysis of problem behavior: A review. Journal of Applied Behavior Analysis, 36, 147-185.

Population: Not stated
Interventions: Functional analysis – “empirical demonstrations of ‘‘cause-and-effect relations’’ between environment and behavior”
Study design: SSRD that included (a) a pretreatment assessment based on (b) direct observation and measurement of (c) problem behavior was conducted under (d) at least two conditions involving manipulation of some environmental variable in an attempt (e) to demonstrate a relation between the environmental event and behavior.
Search dates: Not restricted - 2000
Total evidence base: 277 studies, 58 included ASD, 30% adults, total N = 31, 17 with ASD, 5 aged 13 - 18
Results: Individual study results not reported. Description of the evidence base.

See public comment disposition comment #M8

One of the parameters reported was session duration for functional analysis, which ranged from 1 to 30 minutes (10 minutes is median duration), and the

number of sessions conducted was most commonly 3 or more (83% of studies). The maximum number of sessions was not reported. No report on persistence.

Hagopian, L. , Griffin W. Rooker, and Natalie U. Rolider. (2011) Identifying empirically supported treatments for pica in individuals with intellectual disabilities. Research in Developmental Disabilities 32 2114–2120

Population: Age not specified
Interventions: any treatment of PICA.
Study design: SSRD
Search dates: 1980 - 2011
Total evidence base: 34 studies, 22% included ASD, 20% adolescents, 38% adults, total N = 50
Results: Behavioral treatments were effective at producing an 80% or greater reduction in PICA in 25 of 26 studies. Other 8 studies did not meet criteria for experimental control, treatment efficacy or sufficient description of intervention or patient characteristics and were not discussed further.

No report or comment made pertaining to intensity, duration or persistence.

Dixon, D. , Ryan Bergstrom, Marlena N. Smith, and Jonathan Tarbox. A review of research on procedures for teaching safety skills to persons with developmental disabilities. Research in Developmental Disabilities 31 (2010) 985–994.

Population: Age not specified, individuals with developmental disability
Interventions: any intervention to teach safety skills
Study design: not specified (included SSRD)
Search dates: 1970 - 2009
Total evidence base: 27 studies; ages and % ASD not specified.
Results: Descriptive of included studies. No statistical analysis or synthesis.
Authors conclude: “at least three components appear to often be successful: (1) prompting and prompt-fading, (2) reinforcement, and (3) role-playing”.

Each study is described, but no summary provided. Twenty studies reported on maintenance of behavior response, all of which found maintenance of response in those who achieved a response, with follow up ranging from 1-2 weeks to 16 months.

Young, J., Carolyn Corea, James Kimani, and David Mandell. Final Report on Environmental Scan, Autism Spectrum Disorders (ASDs) Services Project. Submitted to Centers for Medicare & Medicaid Services. IMPAQ International, LLC. March 9, 2010

See public comment disposition, comment #I4

The review concluded that there was only one intervention that could be considered evidence-based for adolescents (antecedent package). For that intervention, duration ranged from 1 to 4 months and intensity ranged from 3 to 5 sessions/week, with each session ranging from 5 minutes to 3 hours. Skills were maintained over a follow up period of 1 to 6 months.

Jennett, H. K., & Hagopian, L. P. (2008). Identifying empirically supported treatments for phobic avoidance in individuals with intellectual disabilities. Behavior Therapy, 39, 151–161.

Population: Age not specified, individuals with intellectual disability with phobia avoidance
Interventions: any psychological treatment for the avoidance or fear of a specific phobia
Study design: group studies, SSRD and case reports
Search dates: 1970 - 2007
Total evidence base: 38 studies; 29% with ASD, 18% adolescent, 50% adults
Results: 12 of 13 SSRD studies "demonstrated efficacy through use of good experimental design". Authors conclude "behavioral treatment as a well-established treatment for phobic avoidance displayed by individuals with intellectual disabilities. " and "All of the studies described that had good experimental designs and were shown to be efficacious included some form of live exposure to the feared stimulus plus reinforcement for appropriate behaviors (e.g., approach or absence of avoidance), suggesting that these are important components of treatment."

No report or comment made pertaining to intensity, duration or persistence.

Meta-analyses of SSRD

Bellini, S., & Akullian, J. (2007). A Meta-Analysis of Video Modeling and Video Self-Modeling Interventions for Children and Adolescents with Autism spectrum disorders. Exceptional Children, 73, 261-284.

Population: Ages 3-20 with ASD
Interventions: video modeling and video self-modeling
Study design: SSRD only
Search dates: 1987 - 2005
Total evidence base: 23 studies; Total N = 73
Results: Authors computed the percentage of non-overlapping data points (PND) for each study, which "provides a measure of intervention effectiveness", measured by "calculating the percentage of intervention data points that do not overlap with the highest baseline data point". the authors state that this statistic is preferable to effect size in synthesizing SSRD for 2 reasons: 1) the data derived from SSRD is not independent, thereby violating a primary assumption of inferential statistics, and 2) many SSRD include relatively few data points, which may inflate the effect size. Authors state that PND scores above 90 represent very effective interventions, scores between 70 and 90 represent effective interventions, scores between 50 and 70 represent questionable effectiveness and scores below 50 are ineffective interventions.

Interventions focused on functional skills resulted in the highest intervention effects (PND* = 89%) followed by social-communication functioning (PND = 77%), and behavioral functioning (PND = 76%). Interventions focused on functional skills resulted in the highest maintenance effects (PND = 100%) followed by behavioral functioning (PND = 82%) and social-communication

functioning (PND = 78%). Generalization effects were high for functional skills interventions (PND = 97%) and were moderate for social-communication skills. Generalization of behavioral functioning skills was not measure in any studies.

Intervention effects for video modeling and video self-modeling (VSM) were both moderate (81% and 77% respectively). Maintenance effects for video modeling and VSM were also both moderate (88% and 71%). Generalization effects were moderate for video modeling (82%) and questionable for VSM (65%).

With regard to frequency and duration, the number of sessions ranged from 4 to 33 (timeframe not specified), and the duration of video clips was 30 seconds to 13.5 minutes.

Bellini, S., Peters, J.K., Benner, L., & Hopf, A. (2007). A meta-analysis of school-based social skills interventions for children with autism spectrum disorders. Remedial and Special Education, 28, 153- 162.

Population: Age limited to children and adolescents with ASD
Interventions: any social skills intervention in the school setting
Study design: SSRD only
Search dates: 1980 - 2005
Total evidence base: 55 studies; Total N = 157
Results: Authors computed the percentage of non-overlapping data points (PND) for each study (see description above). Authors conclude "school-based social skills interventions are minimally effective for children with ASD. Specifically, social skills interventions produced low treatment effects and low generalization effects across participants, settings, and play stimuli. Moderate maintenance effects were observed, suggesting that gains made via social skills interventions are maintained after the intervention is withdrawn."

Maintenance effects were reported in 25 studies and showed moderate results (PND = 80%). Frequency and duration were not reported.

Ma, H. (2009). The effectiveness of intervention on the behavior of individuals with autism: A meta-analysis using percentage of data points exceeding the percentage of data points exceeding the median of baseline phase (PEM). Behavior Modification (2009) 33 339-359

Population: Ages not specified, individuals with ASD
Interventions: any intervention addressing problem behaviors
Study design: SSRD only with sufficient graphical display to calculate PEM
Search dates: 1980 - 2005
Total evidence base: 163 studies; Total N = not stated
Results: Primarily a methods article to demonstrate the use of the statistic "percentage of data points exceeding the median of baseline phase" (PEM) for evaluating interventions for autism. The authors argue against the use of Improvement Risk Difference (IRD) for reasons similar to those stated above for effect size. Other methods are described and rejected:

Mean baseline reduction
Percentage of zero data

Use of the *d* statistic

Authors conclude “five highly effective intervention strategies were priming, self-control, training, positive reinforcement and punishment, and presenting preferential activities. The least effective strategy was to teach perspective taking skills.”

With regard to duration, the authors state “The influence of length of treatment on the effectiveness of treatment. The average length of treatments was 12.78 sessions with a standard deviation of 14.68. The Pearson correlation between the length of treatment and the PEM score was .034, p = .19, depicting that the length of time a treatment lasted did not necessarily produce a larger effect.” Frequency and maintenance were not reported.

Iwata, B.A., Pace, G.M., et al. (1994). The functions of self-injurious behavior: An experimental epidemiological analysis. Journal of Applied Behavior Analysis, 27, 215-240.

Population: Ages not limited, individuals with developmental disabilities (ASD not mentioned) who exhibited SIB, all institutionalized
Interventions: any intervention addressing SIB
Study design: SSRD
Search dates: 1980 - 2005
Total evidence base: 152 studies; Total N = 152, 75% over aged 10, 48% over aged 20
Results: Results of functional assessment reported, not treatment. Authors conclude “Social-negative reinforcement (escape from task demands or other sources of aversive stimulation) accounted for 58 cases, which was the largest proportion of the sample (38.1 %). Social positive reinforcement (either attention or access to food or materials) accounted for 40 (26.3%) of the cases, automatic (sensory) reinforcement accounted for 39 (25.7%), and multiple controlling variables accounted for 8 (5.3%). Overall results indicated that functional analysis methodologies are extremely effective in identifying the environmental determinants of SIB on an individual basis and, subsequently, in guiding the process of treatment selection.”

See public comment disposition comment #M9

The functional analyses were conducted in sessions occurring 2 to 8 times/day, usually 5 days/week. Each session was 15 minutes, and duration ranged from 8 to 66 sessions. Because outcomes of treatment were not the focus of this study, maintenance not reported.

Heyvaert, M., B. Maes, W. Van den Noortgate, S. Kuppens, and P. Onghena. “A multilevel meta-analysis of single-case and small-n research on interventions for reducing challenging behavior in persons with intellectual disabilities.” Research in Developmental Disabilities. 33 (2012). 766–780. Print.

Population: Ages not limited, individuals with intellectual disabilities and challenging behaviors
Interventions: any intervention addressing challenging behaviors

Study design: SSRD and other "small-n" research
Search dates: 2000 - 2011
Total evidence base: 285 studies; Total N = 598, % with ASD not stated
Results: Authors conclude "The average treatment effect was large and statistically significant. However, this effect varied significantly over the included studies and participants." Sensitivity analysis found that interventions on average turn out to be less effective for persons with aggression as the challenging behavior; and that they are on average more effective when the intervention includes the component "manipulating antecedent factors".

Authors detected evidence of publication bias using a regression test for funnel plot assymetry.

Duration ranged from 1 to more than 20 weeks, although only 4 studies were in the latter category, and the majority were between 1 and 5 weeks. Frequency and maintenance not reported.

Harvey et al., 2009. Updating a meta-analysis of intervention research with challenging behaviour: Treatment validity and standards of practice. Journal of Intellectual and Developmental Disability, 34, 67–80

Population: Ages birth to 21 years, individuals with developmental disabilities with challenging behaviors
Interventions: any intervention addressing challenging behavior
Study design: SSRD
Search dates: 1988 - 2006
Total evidence base: 142 studies; Total N = 316, 27% between ages 11 and 15, 14% between ages 16 and 20; 33% with ASD
Results: Authors calculated and reported effect sizes in 4 different ways (PND, percent zero data (PZD), standard mean difference (SMD) and "Allison mean plus trend"). They conclude "Skills replacement, consequence combined with systems change, and antecedent interventions generated selective positive results, large enough to be clinically meaningful. Behavioural interventions effectively reduce challenging behaviour, particularly when preceded by a functional analysis. Teaching replacement skills was most effective, especially if used in combination with systems change and/or traditional antecedent and consequence manipulation."

In 20% of included studies duration was less than 20 weeks, and duration could not be determined in 75% of studies. Post-hoc analysis suggested that both very short (1-3 weeks) and very long (greater than 20 weeks) interventions were less effective than those lasting between 3 and 20 weeks. Authors report that the use of functional analysis was associated with more effective outcomes in maintaining a zero rate of behavior, but do not otherwise report on maintenance. Frequency was not reported.

Campbell, J. M. (2003). Efficacy of behavioral interventions for reducing problem behavior in persons with autism: A quantitative synthesis of single-subject research. Research in Developmental Disabilities, 24, 120-138.

Population: Ages not limited, individuals with ASD

Interventions: any intervention addressing SIB, stereotypy, aggression or property destruction
Study design: SSRD only
Search dates: 1966 - 1998
Total evidence base: 117 studies; Total N = 181, age range 2 - 31
Results: Authors calculated and reported effect sizes in 3 different ways (PND, PZD, and mean baseline reduction (MBLR)). They conclude "behavioral treatments were found to be significantly effective in reducing problem behavior in individuals with autism" and "treatment was equally effective regardless of problem behavior and type of technique used". Also, " presence of a pretreatment functional assessment was found to be a significant variable in treatment, resulting in higher average PZD scores than those obtained in studies that did not include a functional assessment."

Of included studies, 31% collected follow up data, and the mean follow up interval was 6 months. However, maintenance was not reported. The length of treatment per session was reported in 80% of studies, with the mean being 60 minutes. Frequency and total duration of intervention were not reported.

Kahng, S., Iwata, B. A., & Lewin, A. B. (2002). Behavioral Treatment of Self-Injury, 1964 to 2000. American Journal on Mental Retardation, 107, 212-221.

Population: Ages not limited, individuals with developmental disabilities (including ASD) who exhibited SIB
Interventions: any intervention addressing SIB
Study design: SSRD only
Search dates: 1964 - 2000
Total evidence base: 396 studies; Total N = 706, 25% aged 11 – 18, 40% over age 18
Results: Authors conclude "mean outcome of all reported treatments was an 83.7% reduction in SIB from baseline to treatment, and most treatments were successful in reducing SIB by at least 80%. Exceptions were found for the category of reinforcement-based interventions: When used alone and in conjunction with response blocking, reinforcement produced reductions in SIB of approximately 73% for both procedures."

Follow up data was reported in 14% of included studies, and ranged from 2 weeks to 7 years. However, maintenance of effects was not reported, nor were frequency or duration.

Summary

A total of 12 systematic reviews and eight meta-analyses of SSRD included at least some individuals over age 12. Of these, one did not pertain to ABA, 4 did not specify that any of the included population had ASD and 7 were not limited exclusively to individuals with ASD. A variety of interventions were found to be effective using a variety of methods for calculating effect size. Only one study reported negative results (school-based social skills interventions are minimally effective).

Two articles were contradictory concerning publication bias, with one stating that there is no reliable way to test for publication bias in SSRD, and the other documenting the presence of publication bias by creating a funnel plot and testing significance using a regression statistic.

Five of the included reviews did not comment on frequency, duration or maintenance in any way. Six studies reported on frequency of intervention;

- session duration:
    - 15 minutes
    - 60 minutes
    - 30 seconds to 13.5 minutes
    - 5 minutes to 3 hours
    - 1 to 30 minutes
    - 120 minutes/week
- number of sessions:
    - 2-8 times/day, 5 days/week
    - 4-33 sessions
    - 3 to 5 sessions/week
    - 3 or more sessions
    - 4 times/week
    - 10 times/week

Duration of intervention was reported in six studies:

- 4 to 16 weeks
- 1 to 4 months
- Average length of treatment 13 sessions
- 8 to 66 sessions
- 1 to more than 20 weeks
- Less than 20 weeks
- Not reported in 75% of studies

Follow up and maintenance were reported in six studies.
Follow up times:

- 1 to 2 weeks to 16 months
- 1 to 6 months
- 2 weeks to 7 years

Of those reviews that reported on maintenance of effects, the following are the number of included studies reporting this outcome:

- 22%
- 74%
- 45%
- 14%

Of those that specifically reported on maintenance of effects of the intervention, findings were consistently positive, although the one meta-analysis that quantified maintenance effects (using PND) reported moderate results.

MINUTES

Evidence-based Guidelines Subcommittee
Oregon Dental Association
Conference Center
8699 SW Sun Place
Wilsonville, OR 97070
April 24, 2014
2:00-5:00pm

Members Present: Wiley Chan, MD, Chair; Vice-Chair; Vern Saboe, DC; Beth Westbrook, PsyD; John Sattenspiel, MD, MPH; Bob Joondeph, JD; Eric Stecker, MD, MPH (participated by phone from approximately 3:15-4:30).

Members Absent: Steve Marks, MD; Leda Garside, RN, MBA; Som Saha, MD, MPH;

Staff Present: Darren Coffman; Cat Livingston, MD, MPH; Jason Gingerich.

Also Attending: Alison Little, MD (CEBP); Shannon Vandergriff (CEBP); Paul Terdal (Autism Speaks), Barbara Morrow (Astellas).

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1. CALL TO ORDER

The meeting lacked a quorum until 2:30 p.m. Wiley Chan called the meeting of the Evidence-based Guidelines Subcommittee (EbGS) to order at 2:30 pm.

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2. MINUTES REVIEW

No changes were made to the March 20, 204 minutes.
Minutes approved 5-0 (Stecker not present).

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3. EVALUATION OF EVIDENCE: APPLIED BEHAVIOR ANALYSIS (ABA) FOR AUTISM SPECTRUM DISORDERS

A) Update on ABA process and implementation

Coffman provided a review of the process to date and said that in order to meet the legislative timeline, the EbGS needs to approve the document today. Chan invited public testimony.

B) Public comment

Paul Terdal gave public testimony and also introduced Vera, who spoke about her experience with her son, who will soon be thirteen and who has an autism spectrum disorder and is covered under OHP. She said that her son has symptoms including insomnia, toe-walking, hair pulling and he is almost entirely nonverbal. She believes he

has feeling and thoughts but cannot express them. She is concerned about the proposed limits on therapy for children over the age of 12, because she is hoping that expanded coverage of ABA can make a difference for her son.

Terdal said that he appreciates the work of the subcommittee but disagrees with the subcommitee's choices about the sufficiency of evidence and reasonableness of a trial in the population of children over the age of 12. He referenced several studies referenced in the subcommittee's evidence sources which did include some children over 12. He said there is no evidence for decline of effectiveness by age. Changing either of these two factors would change the recommendation according to the HERC Guidance Development framework to a strong recommendation for coverage. He also referenced legal decisions about the reasonableness of a trial. He said that Vera's child would not be here to day if he had received therapy, either because ABA had been effective or because it hadn't and he had sought other treatments.

C) Discussion and approval of modified Evidence Review to send to VbBS/HERC

Livingston reviewed the changes since the last meeting, as described in the meeting materials on page 12 of the PDF document. During the discussion, the group asked that the remaining references to the age range of 2 to 12 be changed to 1 to 12 per the discussion at the subcommittee's previous meeting. In addition, the group decided to use the proposed new pathway in the coverage guidance development framework for ABA treatments for children aged 1 to 12, including EIBI and other less intensive interventions, though the recommendation is still a strong recommendation for coverage. In addition, the group decided to change the language in the GRADE-informed framework from "Comprehensive ABA" to Early Intensive Behavioral Interventions.

For adolescents and young adults, the group made no changes to the guidance development framework, though Joondeph expressed concern that the cutoff was arbitrary. Sattenspiel said that without evidence of global benefit for the broader therapy, the limited coverage shown in this draft makes sense for older children. Westbrook said she also struggles with how it may feel unfair, but said we need to be consistent with how we've treated the evidence in other reviews. Chan noted that in medicine, similar decisions are frequently made based on inclusion criteria for studies. For instance, the use of statins is not well-studied in patients over the age of 75. Joondeph said that he finds the single-subject research design studies submitted by members of the public compelling, even if they do not meet the Commission's normal criteria for sufficient evidence. Westbrook noted, however, that many of these studies used different populations, including people without autism spectrum disorders, and that SSRDs are subject to bias.

After more discussion the group decided to ask Livingston to add language reflecting the subcommittee's differing opinions about the evidence for older individuals.

The group then moved on to discuss the summary conclusions. Though there is no good evidence on which to base decisions about limits on the number of hours, the group decided to use a maximum intensity of 25 hours per week for a maximum of 3 years, using the rationales from the meeting materials.

Larsson expressed concern that these numbers were based on averages and may not accommodate the needs of some patients. His recommendation for coverage for EIBI,

submitted with the packet materials, recommended an average of 20 hours of behavior technician time and an average of 7 hours of behavior analyst services for a maximum of 3 years. Joondeph said that setting a limit based on the average from studies didn't make sense to him. Livingston explained that the evidence included studies with various intensities, above and below 25 hours, and that we lack evidence that the more intensive interventions are more effective. The 25 hour limit would be the same as commercial payers. She said she sees no evidence against a 25 hour limit and does see some reasons to support it. Westbrook asked for clarifications about the exceptions and appeals processes, and Sattenspiel explained that CCOs are required to allow for exceptional circumstances, but are not reimbursed for providing those services. If CCOs deny coverage, patients have the right to appeal the decision.

After reviewing an emailed comment provided by Dr. Fombonne, an appointed expert for this review, the group decided to change the references to "comprehensive ABA" to reference EIBI and clarify that the UCLA Lovaas and ESDM models referenced are examples. The listed standardized assessments are also examples.

The group also discussed the language for less intensive ABA-based interventions, which has been added to the draft. The subcommittee changed the recommendation for duration to allow for an initial six months of coverage, with ongoing coverage based on demonstrated progress towards meaningful predefined objectives or the emergence of new problem behaviors.

For individuals 13 and older the subcommittee clarified the rationale regarding the need for meaningful progress towards predefined goals and changed the phrase "medical necessity" to "medical appropriateness." In addition, the group clarified that coverage for training of parents and other caregivers is appropriate.

The group also made changes to the duration and frequency after broad agreement that reauthorizations more often than every six months don't make sense, as assessment and post-treatment evaluation would take up some of the time.

After further discussion, the group voted to approve the draft evaluation of evidence as modified during the meeting and with additional language by Livingston to reflect disagreement among subcommittee members about strength of evidence in children over the age of 12. **Motion approved 5-0** (Stecker absent)

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4. REVIEW OF NEW DRAFT COVERAGE GUIDANCES ON NUCLEAR CARDIAC IMAGING

Discussion deferred to the next meeting as there was no time to discuss the topic.

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5. PUBLIC COMMENT

Chan invited additional public comment, but no one chose to testify.

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6. ADJOURNMENT

The meeting was adjourned at 5:00 pm. The next meeting is scheduled for June 5, 2014 from 2:00-5:00pm in Room 117B/C of the Meridian Park Hospital Community Health Education Center in Tualatin.

AMA CPT ABA Codes July 2014 Summary

CPT Category III code set:

Tab 101
Applied Behavior Analysis

Adaptive Behavior Assessment

Behavior identification assessment
0359T
Physician or other Qualified Health Care Professional "Professional"
History, observation, tests, interview to describe deficient adaptive or maladaptive behaviors.
Interpretation of results and development of plan of care.
Discussion of findings and recommendations with caregivers.
Preparation of report.

Observational behavioral follow-up assessment
Follows 0359T
0360T 16-45 min
0361T each additional 30 min (List separately in addition to code for primary service)
Professional or Technician under direction of Professional who may or may not be on-site.
Structured observation and/or standardized and non-standardized tests.
Interpretation of results and development of plan of care.
Discussion of findings and recommendations with caregivers.
Preparation of report.
Based on the time that the patient is face-to-face with one or more technician(s). Only count the time of one technician when two or more are present. Report days separately.

Exposure behavioral follow-up assessment
Follows 0359T
0362T 16-45 min
0363T each additional 30 min
Professional with the assistance of the Technician
Exposing the patient to a series of social and environmental conditions associated with Destructive Behavior(s) in a structured, safe environment.
Interpretation of results and development of plan of care.
Discussion of findings and recommendations with caregivers.
Preparation of report.
Based on the time that the patient is face-to-face with one or more technician(s). Only count the time of one technician when two or more are present. Report days separately.

Adaptive Behavior Treatment

Adaptive behavior treatment by protocol
0364T first 30 min
0365T each additional 30 min
Technician under direction of Professional who may or may not be on-site.
Face-to-face with one patient.
Utilizing a behavior intervention protocol designed in advance for deficient adaptive or maladaptive behaviors.
Based on results of previous assessments.

Group adaptive behavior treatment by protocol
0366T first 30 min
0367T each additional 30 min
Technician under direction of Professional who may or may not be on-site.

face-to-face with two to eight patients
Utilizing a behavior intervention protocol designed in advance for deficient adaptive or maladaptive behaviors
Based on results of previous assessments.

Adaptive behavior treatment with protocol modification
0368T first 30 min
0369T each additional 30 min
Professional with or without Technician present.
Face-to-face with one patient.
professional resolves one or more problems with the protocol
may simultaneously instruct a technician and/or guardian(s)/caregiver(s) in administering the modified protocol.
Based on results of previous assessments.

Family adaptive behavior treatment guidance
0370T
Professional with or without Technician present
Face-to-face with guardian(s)/caregiver(s), of one patient, without the presence of a patient,
Involves identifying problem behaviors and deficits and teaching guardian(s)/caregiver(s) to utilize treatment protocols designed to reduce maladaptive behaviors and/or skill deficits.
Based on results of previous assessments.

Multiple-family group adaptive behavior treatment guidance
0371T
Professional
Face-to-face with guardian(s)/caregiver(s), of two to eight patients, without the presence of a patient,
Involves identifying problem behaviors and deficits and teaching guardian(s)/caregiver(s) to utilize treatment protocols designed to reduce maladaptive behaviors and/or skill deficits.
Based on results of previous assessments.

Adaptive behavior treatment social skills group
0372T
Professional
Face-to-face with two to eight patients,
Focusing on social skills training and identifying and targeting individual patient social deficits and problem behaviors.
Based on results of previous assessments.

Exposure adaptive behavior treatment with protocol modification
0373T first 60 minutes of technicians' time,
0374T each additional 30 minutes of technicians' time
Technician under supervision of Professional
Face-to-face with patient
Services provided to patients with one or more specific severe maladaptive behaviors with direct supervision by a Professional which requires two or more technicians face-to-face with the patient for safe treatment.
Technicians elicit behavioral effects of exposing the patient to specific environmental conditions and treatments.
The Professional reviews and analyzes data and refines the therapy using single-case designs
The therapy is conducted in a structured, safe environment.

SUMMARY CONCLUSIONS with additional language for consideration

Children age 12 and younger

Applied behavior analysis (ABA), including early intensive behavioral intervention (EIBI), is recommended for coverage[1] for treatment of autism spectrum disorder[2] (*strong recommendation*).

> Rationale: This strength of recommendation was based on sufficient (moderate quality) evidence and expert input, including testimony on parent/caregiver values and preferences.

Specifically, comprehensive ABA, including EIBI, is recommended for coverage for an average of 20~~up to 25~~ hours per week of behavior technician and an average of 7 hours per week of behavior analyst services for a maximum of 3 years.

> Rationale: In studies showing benefit, interventions ranged from less than two to 6~~4~~0 hours per week and had a studied duration of 10 weeks to more than three years. No specific minimum duration or intensity has been determined to be required for efficacy. 25 hours a week was chosen based on SB 365 as well as efficacy demonstrated in studies with 25 hours per week, without evidence of increased intensity beyond this level yielding improved outcomes.

Initial coverage of comprehensive ABA should be provided for up to six months. Ongoing coverage should be based on demonstrated progress towards meaningful predefined objectives (objectives should be achieved as a result of the intervention(s) under scrutiny, over and beyond gains that would be expected to arise from maturation alone) using a standardized, multimodal assessment, no more frequently than every six months *(strong recommendation).* Examples of standardized criterion-referenced and norm-referenced assessments include tests of adaptive functioning, developmental assessments, tests of cognitive skills, tests of communication skills, behavior checklists, and autism symptom rating scales. The schedule of administration of the various assessments should follow the publisher's recommendations. The schedule of administration of the various assessments should follow the publisher's recommendations. ~~Examples of such assessments include Vineland, IQ tests (Mullen, WPPSI, WISC), language measures, behavioral checklists (CBCL, ABC), and autistic symptoms measures (SRS).~~

> Rationale: Ensuring that patients are making meaningful progress is important to ensure quality outcomes and effective use of resources. The six month assessment

[1] These conclusions apply to the Oregon Health Plan as governed by the Prioritized List of Health Services and to no other health plan.
[2] Autism spectrum disorder should be diagnosed by a qualified health care professional according to DSM-5 criteria.

was chosen based on expert input to allow for sufficient time for progress while not being burdensome to providers and plans.

If comprehensive ABA is not indicated, has been completed, or there is not sufficient progress toward multidimensional goals, then targeted behavioral interventions (including focused ABA*) are recommended for coverage to address specific problem areas as needed, ~~up to~~for a minimum of 8 hours per month ~~(up to age 12, 18 or no limit)~~ of behavior analyst services and up to 8 hours per week of behavior technician services. *(weak recommendation).*

Rationale: Not all autistic children require comprehensive therapy and focused interventions will be appropriate for many, or appropriate for those who have completed 3 years of intensive intervention. Additionally, there is not good data that focused ABA is more effective than other types of interventions (although there is even less evidence to support any alternative treatment modality) -and so the language is open to other types of targeted behavioral interventions as well. Eight hours was chosen based on a wide range of intensity in the literature, expert input, and previous HERC Prioritized List guideline precedent.

Parent/caregiver involvement and training is recommended to be a component of treatment *(strong recommendation).*

Rationale: Evidence and expert input indicated that parental involvement in ABA is a key part of effective treatment. Where parent capacity for supporting treatment is limited, inpatient or day treatment should be considered.

~~Children~~ Individuals ages 13 and older

Comprehensive ABA is not recommended for coverage for treatment of autism spectrum disorder in persons over the age of 12 (*weak recommendation*).

Rationale: There is insufficient evidence to support intensive ABA treatment at older ages, although there is no experimentally controlled evidence to indicate a decline in effectiveness with age, even less evidence to support any alternative treatment modality, and strong evidence that a failure to treat autism can result in serious disability.~~.~~

For ~~children *(and adults?)*~~individuals age 13 and older, targeted behavioral interventions, including focused ABA*, is recommended for coverage for ~~up to~~a minimum of 8 hours per

month of behavior analyst services and up to an average of ~~up to~~ 8 hours per week of behavior technician services, to address specific problem behaviors (*weak recommendation*

Rationale: There is insufficient evidence to support effective interventions in this age group. However, problem behaviors (such as aggression, self-injury, property destruction, pica, or other significant impairment in day to day living) can be challenging to the individual, caregivers, and society and may result in serious disability if left untreated, making a clinical trial unreasonable. It is reasonable to consider targeted interventions for specific problem behaviors with clear objectives and ongoing proof of medical necessity.

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*Focused ABA is defined as targeted ABA-based interventions addressing 1-2 problem behaviors (e.g. self-injurious behavior) for a period of ~~no longer than 2~~6 months which includes the initial assessment phase and transitional programming phase to ensure sustained benefit. The interventions should involve predefined behavioral objectives that would result in socially important and sustainable outcomes for the individual. Ongoing coverage of targeted behavioral interventions is based on evidence of documented improvement (as a result of the intervention) and ongoing need for services, ~~at least every 30 XX days~~every six months. *(weak recommendation)*

Parent/caregiver involvement and training is recommended to be a component of focused ABA treatments. *(strong recommendation).*

Rationale: Evidence and expert input indicated that parental involvement in ABA is a key part of effective treatment.

Behavior analytic assessment and analysis is recommended for coverage for an initial period of 40 hours to establish the medical necessity of either comprehensive or focused ABA treatment and to identify treatment targets.

Rationale: Behavior analytic services are recommended for an initial period to collect direct observational data on the patient's levels of functioning and severity of needs, evaluate current levels of services and supports, establish a baseline for evaluation of continued coverage, identify and prioritize treatment targets, and recommend medically necessary treatment procedures, settings, and intensity.

Inpatient ABA treatment is recommended where parent capacity for active involvement in treatment is limited, the risk to the client's health is significant (e.g., due to self injury, aggression, pica, elopement), or treatment is determined to be medically necessary to produce gains in skills such as self-care, cooperation with medical and dental procedures, functional communication, or personal safety. A decision to discharge the patient should be based upon treatment team determination that the client is behaviorally stable and no

longer a risk to self or others when treatment is implemented by trained care providers, the treatment has been generalized and modified to the extent it can be implemented in community settings, and care providers have been trained to implement the ABA interventions correctly and consistently *(strong recommendation).*

Note: The evidence for the treatment of conditions comorbid with autism spectrum disorder is beyond the scope of this evidence summary.

SUMMARY CONCLUSIONS with revisions and additional language for consideration

Report by ABA Experts Eric Larsson, Gina Green, and Louis Hagopian (4/16/2014)

Children ages 12 and younger

Comprehensive applied behavior analysis (ABA) treatment, including early intensive behavior analytic intervention (EIBI), is recommended for coverage[1] for treatment of autism spectrum disorder[2] in children age 12 years and younger (*strong recommendation*).

> Rationale: This recommendation was based on sufficient (moderate quality) evidence and expert input, including testimony on parent/caregiver values and preferences.

Specifically, comprehensive ABA treatment, including EIBI, is recommended for coverage for a minimum of 20 hours per week of behavior technician services directly to the patient and a minimum of 7 hours per week of direct behavior assessment, monitoring, staff and parent training, analysis and treatment planning, and clinical oversight by a professional behavior analyst. Additional hours may be authorized on an individual basis when medically necessary. Comprehensive ABA treatment may be delivered in inpatient or outpatient settings, or a combination thereof. The duration of treatment shall be determined by the ABA treatment team based on evidence of medical necessity to prevent serious disability (as defined by the American Academy of Pediatrics, June 2013) and patient progress.

> Rationale: In studies of comprehensive ABA interventions for young children with ASD, intensity ranged from 10 to 40+ hours per week for a duration of one to three or more years. The best available evidence indicates that EIBI of at least 30 hours per week for at least two years produces optimal outcomes (Eldevik et al., 2010). Research and best practices in ABA treatment indicate that for children with ASD who make sufficient gains, the number of ABA treatment hours per week is generally reduced when the child is being transitioned to typically available services. The recommendation above is based on SB 365 and expert input. The minimum intensity and duration reflect the lower end of the range of comprehensive ABA intervention that research has shown to be efficacious for preventing serious disability.

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[1] These conclusions apply to the Oregon Health Plan as governed by the Prioritized List of Health Services and to no other health plan.

[2] Autism spectrum disorder should be diagnosed by a qualified health care professional according to DSM-5 criteria.

Initial coverage of comprehensive ABA treatment should be provided for up to six months. Ongoing coverage should be based on evidence of medical necessity and demonstrated progress towards meaningful predefined objectives (objectives should be achieved as a result of the intervention(s) over and above gains that would be expected from maturation or experience alone). Decisions about ongoing coverage should be based on a combination of data from direct behavioral observation and measurement of progress on treatment objectives, as well as results of standardized assessments administered no more frequently than every six months *(strong recommendation).* Examples of standardized criterion-referenced and norm-referenced assessments include tests of adaptive functioning, developmental assessments, tests of cognitive skills, tests of communication skills, behavior checklists, and autism symptom rating scales.

> Rationale: Ensuring that patients are making meaningful progress is important to produce quality outcomes and effective use of resources. The six-month assessment period was chosen based on expert input to allow for sufficient time for progress while not being burdensome to providers and plans.

Focused ABA interventions are recommended for coverage to address specific target behaviors where comprehensive ABA has been determined not to be medically necessary, has been completed, or where there is objective evidence that it did not produce meaningful progress or prevent serious disability in the patient, or for treatment of a co-morbid condition. Treatment targets should include the core symptoms of ASD as well as associated behaviors and skills that directly affect the patient's health, safety, and overall functioning (e.g., self-injury, aggression, pica, elopement, self-care, cooperating with medical and dental procedures, communicating, seeking help appropriately, avoiding hazards). The intensity and duration of focused ABA interventions shall be determined by the ABA treatment team based on evidence of medical necessity and patient progress. Coverage is recommended for a minimum of 8 hours per month of direct behavior assessment, monitoring, staff and parent training, analysis and treatment planning, and clinical oversight by a professional behavior analyst and a minimum of 8 hours per week of behavior technician services. Additional hours may be authorized on an individual basis when medically necessary. The treatment team shall also prioritize treatment targets, ensuring that interventions to reduce problem behaviors are accompanied by interventions to increase functional alternative behaviors and skills. Focused ABA interventions may be delivered in inpatient or outpatient settings or a combination thereof *(strong recommendation)*.

> Rationale: Systematic reviews of aggregated ABA controlled clinical trials, including meta-analyses, show that focused ABA interventions are more effective than no treatment, treatment as usual, and several other types of interventions for reducing problem behaviors and building useful skills, thereby promoting growth and development and preventing serious disability (thus meeting the American

Academy of Pediatrics criteria for medically necessary treatments). There is insufficient scientific evidence that interventions other than ABA meet those criteria, and clear evidence that failure to provide ABA treatment can result in severe disability. Focused ABA interventions are appropriate for many children and youths with ASD, including some who have completed comprehensive ABA treatment and are transitioning to typically available services. The recommendations are based on the best available scientific evidence as well as expert input and best practices in ABA treatment (see *Behavior Analyst Certification Board Guidelines: Health Plan Coverage of Applied Behavior Analysis Treatment for Autism Spectrum Disorders*).

Parent/caregiver involvement and training is recommended to be a component of comprehensive and focused ABA treatments *(strong recommendation).*

Rationale: Evidence and expert input indicated that parental involvement in ABA is a key part of effective treatment. Where parent capacity for involvement is limited, inpatient day treatment is recommended.

Behavior analytic assessment and analysis is recommended for coverage for an initial period of 40 hours to establish the medical necessity of either comprehensive or focused ABA treatment and to identify treatment targets.

Rationale: Behavior analytic services are recommended for an initial period to collect direct observational data on the patient's levels of functioning and severity of needs, evaluate current levels of services and supports, establish a baseline for evaluation of continued coverage, identify and prioritize treatment targets, and recommend medically necessary treatment procedures, settings, and intensity.

Individuals ages 13 and older

Comprehensive ABA interventions are recommended for coverage for treatment of autism spectrum disorder in persons over the age of 12 when there is a discrete set of clearly defined, medically important objectives for the treatment. (*strong recommendation*).

Rationale: There is a large body of ABA controlled clinical trials published in peer-reviewed scientific journals that involved several thousand older individuals with ASD and related disorders. Moreover, these studies have typically been conducted in settings where the interventions comprised multiple ABA procedures with a multiple treatment objectives. Further, there is no evidence that comprehensive ABA treatment is ineffective for producing clinically significant improvements in older patients, and there is even less evidence to support any alternative treatment

model for that population. Systematic reviews of that research, including meta-analyses, have demonstrated that many ABA interventions, singly and in various combinations, are more effective than no treatment, treatment as usual, and several other types of interventions for reducing problem behaviors and building useful alternative skills, thereby promoting growth and development and preventing serious disability in individuals with ASD over the age of 12 years (thus meeting the American Academy of Pediatrics criteria for medically necessary treatments). Decisions about the nature, intensity, and duration of ABA treatments for each patient with ASD over the age of 12 years should be based on objective evidence of the medical necessity of the treatment for that individual. Failure to treat autism can result in serious disability, making traditional randomized or other group-design clinical trials unreasonable as per the HERC Guidance Development Framework, and warranting a strong coverage recommendation even if evidence is deemed insufficient.

Focused ABA interventions are recommended for coverage to address specific target behaviors where comprehensive ABA has been determined not to be medically necessary, has been completed, or where there is objective evidence that it did not produce meaningful progress or prevent serious disability in the patient, or for treatment of a co-morbid condition. Treatment targets should include the core symptoms of ASD as well as associated behaviors and skills that directly affect the patient's health, safety, and overall functioning (e.g., self-injury, aggression, pica, elopement, self-care, cooperating with medical and dental procedures, communicating, seeking help appropriately, avoiding hazards). The intensity and duration of focused ABA interventions shall be determined by the ABA treatment team based on evidence of medical necessity and patient progress. Coverage is recommended for a minimum of 8 hours per month of direct behavior assessment, monitoring, staff and parent training, analysis and treatment planning, and clinical oversight by a professional behavior analyst and a minimum of 8 hours per week of behavior technician services. Additional hours may be authorized on an individual basis when medically necessary. The treatment team shall also prioritize treatment targets, ensuring that interventions to reduce problem behaviors are accompanied by interventions to increase functional alternative behaviors and skills. Focused ABA interventions may be delivered in inpatient or outpatient settings or a combination thereof *(strong recommendation)*.

Rationale: Systematic reviews of aggregated ABA controlled clinical trials, including meta-analyses, show that focused ABA interventions are more effective than no treatment, treatment as usual, and several other types of interventions for reducing problem behaviors and building useful skills, thereby promoting growth and development and preventing serious disability (thus meeting the American

Academy of Pediatrics criteria for medically necessary treatments). There is insufficient scientific evidence that interventions other than ABA meet those criteria, and clear evidence that failure to provide ABA treatment can result in severe disability. Focused ABA interventions are appropriate for many children and youths with ASD, including some who have completed comprehensive ABA treatment and are transitioning to typically available services. The recommendations are based on the best available scientific evidence as well as expert input and best practices in ABA treatment (see *Behavior Analyst Certification Board Guidelines: Health Plan Coverage of Applied Behavior Analysis Treatment for Autism Spectrum Disorders*).

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Inpatient ABA treatment is recommended where parent capacity for active involvement in treatment is limited, the risk to the client's health is significant (e.g., due to self injury, aggression, pica, elopement), or treatment is determined to be medically necessary to produce gains in skills such as self-care, cooperation with medical and dental procedures, functional communication, or personal safety. A decision to discharge the patient should be based upon treatment team determination that the client is behaviorally stable and no longer a risk to self or others when treatment is implemented by trained care providers, the treatment has been generalized and modified to the extent it can be implemented in community settings, and care providers have been trained to implement the ABA interventions correctly and consistently *(strong recommendation).*

Note: The evidence for the treatment of conditions comorbid with autism spectrum disorder is beyond the scope of this evidence summary.

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Health Care for Children Who Suffer from Autism: Maximizing the Value Returned from Health Care Coverage

Eric V. Larsson, Ph.D., L.P., B.C.B.A.-D. (2012)

The use of regulatory resources is most cost-effective when incorporating measures of quality and outcomes, as well as quantity. Applied Behavior Analysis for autism offers the kind of objective data needed to make efficient care determinations.

This focus mirrors concepts proposed by Health Care Reform initiatives, such as those by the Mayo Clinic and the Minnesota Department of Health's value-based initiative. These initiatives combine measures of cost with measures of quality to control health care delivery based upon value.

Where independent case reviewers can not hope to provide the level of oversight needed to make cost-saving determinations for each individual, a system of managing provider organizations can be much more efficient and effective.

Medical necessity should be based upon the evidence and the community standard of care. However, to date, most policy makers have only relied upon one level of evidence-based care determination. But actually, there are five important levels of value-based decision-making that result in the most helpful allocation of resources to all children.

Because Applied Behavior Analysis for autism incorporates objective outcome data, it is one area where all five levels of evidence that can be used to manage the costs of autism treatment. How would this work?

In brief, in 1972, Lovaas published the first long-range outcome study of early intervention with children with autism. For the first time, this study showed the potential that children had to make clinically important gains. These children had all been placed into state hospitals, with no hope of recovery from their symptoms, and no hope of acquiring basic language and play skills. To everyone's amazement, the 16 children did make clinically significant progress. But what is less well known is that the study was the first of its kind to identify prognostic indicators of response to treatment. Essentially, Lovaas was able to identify four types of candidates for treatment. These four types came from a matrix of older and younger children, interacting with children who had high parental involvement and low parental involvement. Lovaas' conclusions were that the children, who responded best, were the younger children, who had high parental involvement. He then initiated his plan to focus on that segment of the population. His determination was to provide the earliest possible treatment in the family homes of the children, with the plain intention of training the parents to be the children's own therapists.

The other children who did not benefit from parent training were not to be "thrown away," as they had already been by society, but instead they were to be referred to other valuable treatment modalities such as center-based treatment, with other services such as medical management, respite, and social groups.

In 1987 and 1993, his subsequent research proved the value of that approach, and found more accurate measures of responsiveness to treatment. When replications of the approach were published in 2005, 2006, and 2007, it became clear that we can maximize the value of our limited health care dollars by focusing on real outcome measures and determining the best matrix of services for each child.

Today, the present cost-containments system would incorporate these concepts to determine the absolutely best treatment options for each child, and make the best possible referrals, based upon their prognostic indicators. Each child will receive their optimal treatment, and society's resources will be best conserved, if each child can benefit from the earliest possible care determinations. But it is much more than a single decision. What we have learned in this dynamic, 35-year process of treatment development, is that there are several levels of evidence that help determine the best course of treatment for each child. See the following table for a summary of the process.

Using evidence-based treatment data to maximize the value of health care for each child

1) Scientific Actuarial Research on Average Costs and Outcomes

The first level is the obvious one that most policy makers are aware of: the research on evidence-based treatment – children should receive the kind and level of treatment that has been proven to be most effective in meeting clinical needs. This evaluation must be ongoing, as new research indicates innovative approaches.

2) Process Research on Service-Delivery Effectiveness and Accessibility

But, the second level is to determine the best service-delivery method for each treatment. Some methods of delivery will be much more effective than will others. Some will be much less costly than others. Some will entail much less risk than others. And some will be much more accessible than other.

At this level the important principle of "payment reform," is investigated. Some models of payment create disincentives for cost-effectiveness. For example, if payment is only made for the direct hours of one-to-one behavior therapy, and not for the behavior assessment, behavior analysis, and clinical supervision, then there is a disincentive to phase out intensity as the child responds, because a certain intensity of direct hours is required in order to cover the overhead costs. There is also a disincentive to provide low-intensity parent training to less affected children. The reimbursement model may also not accommodate long-distance services in rural areas. Or it may not allow for high-risk services for the dangerous children who become the highest cost children in the future.

3) Value-Based Assessment and Certification of Individual Provider Agencies

However, the third level of care determination is based upon a frank realization that some provider agencies are better suited to success with certain forms of treatment than others. And some have frankly abused the system. Therefore this level of care determination is to identify the most cost-effective provider organizations that are delivering each type of treatment.

4) Prescriptive Assessment of Individual Children at Intake

A fourth level is to identify the optimal form of treatment, intensity, and service delivery for each individual child at intake – to prescribe this optimal treatment based upon individual measures of prognosis, such as parental involvement, age, and complicating conditions.

5) Prescriptive Assessment of Individual Children's Responsiveness to Treatment

But the maximum value is not received until the fifth level in which care-determination is based upon each individual child's responsiveness to treatment. Each child should be periodically re-assessed and referred to the optimal treatment as they show individualized patterns of response to treatment, just as every other form of medicine does. Each child will not respond the same way, and present technology does not accurately predict treatment outcomes three years hence. In our ongoing research we have found that a dynamic assessment of a child's response to treatment over time is a much better predictor than is a single static assessment at a single point in time. Therefore, in the case of early intensive home-based intervention, we have found that every six months is a cost-effective time frame for re-evaluating responsiveness to treatment and making different referrals based upon these assessments.

What Will be the Cost Impact of Covering ABA for autism?

Several state Medicaid programs and private insurance companies have had a formal ABA benefit for 6 or more years, and have published data on the actual cost of their autism coverage. With that kind of substantial track record, here's what we do know for a fact.

In states who have provided accessible funding and ABA services over a period of years, the actual utilization of ABA has proven to be much less than expected. Some of the reasons for the lower utilization of ABA include:

1) While the number of cases of autism that are diagnosed are very high, only about one third of the children have high needs for care.
2) The average age of diagnosis is estimated by the CDC to be 5.7 years of age (Shattuck, et. al., 2009). While the intent of ABA is to be delivered as early as possible, half of the target pool is not identified until after reaching school age. This dramatically decreases the average weekly hours of home-based services.
3) Not every family will be able to access ABA due to their location and other family challenges. The rural and the inner city families continue to be dramatically underserved.
4) Many other kinds of treatments are available, and various families will make other value-based choices than to engage in intensive services.
5) It continues to be a significant challenge to train the medical and social service referral sources to understand and refer to ABA.
6) The growth in available providers has been slower than might be expected, due to the high cost of personnel training and certification.

Therefore the average cost of ABA per child with autism is much lower than commonly estimated. Here are four state's experiences:

The state of Pennsylvania's Medicaid program has been widely available to children with autism since the mid 1990's. Abt Associates Inc (2007) reported that the Pennsylvania Medicaid program covered 13,800 children with autism in 2007, at an average annual cost of $14,300 per child for all services (including ABA). There were 8,516 other diagnosed children with autism who did not access services. If this cost was extended to all children with autism (both covered and not covered), the average cost was $8,843 per child. If this cost was extended to all children in Pennsylvania, the cost was $59 per child.

The state of Wisconsin also had widely available services since the mid 1990's. In 2004, they reported that after six years of widespread availability of Medicaid funding for ABA, only 1,073 children, out of 7,867 eligible children, were accessing ABA in 2002. The average cost per child accessing ABA was $29,545. The average cost per eligible child was $4,030. The average cost per every child was $27 per year.

In Minnesota, after seven years of widely accessible Medicaid funding, it was reported in 2009 that only 541 children out of a total of 3,333 eligible children, were accessing ABA. The average cost of treatment for those children was $31,000. If that cost were averaged across all children with autism, the average cost would be $2,910. Across all children in the state, that cost would be $19 per child per year. At the same time Blue Cross Blue Shield of Minnesota also made coverage of EIBI widely available. Their data closely matches the incidence and cost data of the Medicaid program.

Similarly, in one of the Medicaid regions of California where ABA has been most widely available over a period of years, it was reported in 2009 that that about one third of the eligible children accessed ABA. The average cost was slightly over $10,000 per child treated. Across all of the children with autism in the region, the cost was $3,361 per child, and across all children in the region, the cost was $22 per child per year.

In these four states, the average utilization of ABA was 34% of all eligible children. The average cost per child (all children in the state or region) was $32 per year.

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How should the intensity of BCBA Supervision and BT Intervention be managed for Applied Behavior Analysis (ABA) and Early Intensive Behavioral Intervention (EIBI) for Autism?

Eric V. Larsson, PhD, LP, BCBA-D (2013)

Summary.

Early Intensive Behavioral Intervention (EIBI) is commonly described by the number of hours of staff time devoted to child training, commonly 35-40 hours per week in its intensive phases (though the reported range is 10-60 hours per week- see below). However, this characterization ignores the crucial medically necessary roles of the Behavior Analyst (BCBA) Clinical Supervisors and Senior (BCaBA) Behavior Therapist, who are critical to effective early intervention. Indeed, it is their experienced, direct role in therapy (in designing and dynamically adjusting therapy across the three-year sequence; training staff and parents on the ever-changing treatment procedures; and ensuring that the child's essential behavioral challenges are being remediated by both parents and staff), that is more essential than are the number of hours of direct time provided to the child by the rest of the behavior therapists. In many respects, the intensive direct time with the child is necessary to deliver sufficiently skilled therapy to every child treated, and to spell the parents of the incredible stress of round-the-clock functional therapy. But it is the skilled and timely direct Behavior Analysis that ensures that the child's therapy is not squandered. What follows is a review of the purpose of Behavior Analyst Clinical Supervision, and a review of the published evidence for Behavior Analyst Clinical Supervision and BCaBA Behavior Therapy services. In this review, the evidence supports a common range of 6-18 hours per week of such direct services (though the reported range is 2-22 hours per week). The most cost effective formula for hours is more complex than a simple average, as is shown below.

ABA research suggests ways to increase cost effectiveness and accessibility, and conforms with the trend in health care reform, which is to manage payment principles to motivate performance based upon outcomes, while avoiding disincentives for cost containment.

The net benefit of payment reform is that children will receive a more accurate level of intensity, customized to their needs. Their services will be more cost effective; they will be able to access treatment more quickly thus benefiting to a greater extent from earlier intervention; and the children who aren't benefitting will be determined more quickly and referred to better services as soon as possible.

The purpose of intensive Behavior Analyst Clinical Supervision and Behavior Therapy.

As certified by the Behavior Analyst Certification Board, ABA clinical supervisors have the credential of "Board Certified Behavior Analyst" – BCBA, and ABA senior behavior therapists have the credential of "Board Certified Assistant Behavior Analyst" – BCaBA.

The main roles of the BCBA and BCaBA include intensive parent training, periodic and accountable behavioral assessment of treatment, co-therapy interventions, and assurance of protection from harm.

Intensive parent training. One goal of Early Intensive Behavioral Intervention (EIBI), which most parents expressly seek, is to recover the child from the symptoms of autism (Maurice, 2001). One proven model of recovery-oriented treatment requires extensive parent involvement in a complex and dynamically changing treatment plan over a period of time that ranges from 18 months to five years for most cases (Lovaas & Smith, 2003). When providers do not share such goals, it is reasonable for them to gain the parents' consent for eclectic or lesser intensity services. But parents should be well informed that it also clearly proven in research that services which do not demand of the parents that they engage in effective therapeutic skills 24 hours a day, seven days a week, are unlikely to result in the kind of recovery that they should expect from the expense of intensive treatment (Leaf, Taubman, & McEachin, 2008).

The most central focus of this comprehensive therapy is the family therapy. In each family's case, extensive support and parent training is required, not just to train the parents to rationally use therapy skills, but also to support them in emotionally adopting new parenting behavior (which is in direct conflict with their history of parenting and long-term family history). Helping a parent to effectively follow through with therapy at the checkout counter, in the car, at the doctor's office, at mealtime, during a play date, at bedtime, at the grandparents' party, etc. is extremely challenging. In effective EIBI, the parents are not just responding effectively to a tantrum or other dangerous behavior, but they are also teaching social language skills at the same time, in embarrassing public situations. Further, the mother and father are not typically working together consistently when therapy begins, and their own conflicts must be addressed. Most typical families muddle through such difficult times and their children develop typically, because they are not afflicted by autism. However, if the goal of treatment is to change the very autistic symptoms that stand in the child's way of typical functioning, then families cannot succeed without extensive emotional support and skill-training expertise.

Parents do not change their emotional behavior easily. They require frequent direct supervision by sophisticated staff, during every aspect of therapy, in order to effect change. In addition, they require frequent parent-training co-therapy with a BCaBA behavior therapist who is narrating and instructing them while they observe the model of a behavior therapist working effectively with their child. In many cases, they also require separate direct counseling by the supervisors while a behavior therapist is managing their child, simply to be able to focus on the issues at hand without constant distractions.

As part of this extensive and necessary comprehensive family skills training, the provider would also conduct a weekly review with the parents and all staff involved. This clinical review "meeting" is essential to the continuity of care of the treatment plan, by providing simultaneous direction to the parents as well as the staff, and much specific family skills training is done in this "meeting" every week. Finally, this meeting serves as an ITP review meeting on a weekly basis to ensure that the family is fully and genuinely informed of the latest treatment recommendations, goals, and procedures. Their successful training in the meeting is part of their weekly consent to the treatment.

Periodic and accountable behavioral assessment of treatment. This heavy investment in comprehensive family therapy will be beneficial, to whatever extent the child achieves the recovery objectives. Should the child begin to show diminished results in this treatment, it is essential to be certain to detect that trend as quickly as possible, and attempt to remediate that; but also to be quick to transition the child on to traditional services if the intensive services can do no better. If treatment falls short of recovery goals, then at the very least, the parents will have been trained to effectively provide the ongoing treatment that the intensive provider will no longer provide. If treatment data shows that the child is maximally benefiting from the level of services provided, then the provider will continue to recommend the medically necessary level of services. The determination of medical necessity can be based upon the following process.

The EIBI provider develops, implements, and evaluates many specific individualized treatment objectives on a weekly basis. However, those weekly ITP objectives are not suitable for determining the ultimate prognosis or cost-benefit analysis of the child's treatment. Nor is it appropriate to expect either the family

or the funder to wait 18 months to five years in order to evaluate the results. Therefore, every six months the provider would conduct a comprehensive, multi-modal assessment, which includes an analysis of the child's functional behavior patterns, typical social behavior with the parents, clinical focus of therapy, criterion-referenced progress in a standard set of skills, norm-referenced progress on developmental milestones, independently evaluated progress on standardized assessments, overall rate of acquisition on weekly objectives, timely achievement of individualized benchmarks, treatment condition suitability, diagnostic status, and achievement of standard long-term discharge objectives. Then the provider would make recommendations to the family for the most suitable treatment services for the next six-month term. As part of this comprehensive assessment, the provider would evaluate the child's timely achievement of individualized benchmarks. In the child's case, the provider reports the results of such a multi-modal assessment and the subsequent determination of medical necessity for the next six months, with requests for prior authorization of coverage for treatment.

The Behavior Analyst Clinical Supervisors are heavily engaged in timely, direct observation, assessment, and treatment planning in order to ensure that the treatment is effective. Most of this activity is conducted at the same time as the behavior therapists work with the children. This is because the clinical supervisors must observe and intervene with staff and parent implementation on a weekly basis, in order to direct optimal treatment. The effectiveness of the clinical supervision is significantly weakened without direct observation, and active analysis of the effects of the clinical direction.

Then, every six months the clinical supervisor conducts a comprehensive, multi-modal assessment, which includes an analysis of the child's functional behavior patterns, typical social behavior with the parents, clinical focus, criterion-referenced progress in the standard set of skills, norm-referenced progress on developmental milestones, independently evaluated progress on standardized assessments, overall rate of acquisition on weekly objectives, timely achievement of individualized benchmarks, treatment condition suitability, diagnostic status, and achievement of standard ultimate discharge objectives.

Co-Therapy Interventions. In addition to the direct treatment of the parents, and the direct behavioral assessment and analysis functions of clinical supervision, EIBI is optimally composed of regular co-therapy interventions. Some particular examples of staff co-therapy activities are the following.

One of the most crucial skills, which leads to recovery from autism, is observational learning. The child who suffers from autism is simply not imitating the behavior of his siblings and peers with the natural fervor of the typical child. By contrast, the typical child readily seeks out other children, insightfully recognizes the intent of their behavior, and learns by imitating it. For example, imagine children playing tag in the back yard. A typical child may get a few pointers from their peers, but they quickly acquire the skill and all of its nuances. However for the child who is suffering with autism, the game is a confusing chaos, that they may not seem motivated to decipher. If the child becomes confused and fails, the child will lose motivation to participate. Therefore, in intensive intervention, the staff will simulate the complex peer activity in a less complex manner, and repeat the training until the child master's the skill. It will require the assistance of several persons (parents, siblings, peers, and/or staff) to successfully teach the observational learning.

In the first few months of treatment, as a necessary prerequisite to complex observational learning, one therapist will model simple play behaviors, while a second therapist immediately prompts and reinforces the child's imitation. If this therapy is efficient enough, the child will rapidly acquire the skill of imitation, and be on the road to substantial improvement. Without efficient therapy, children may fail to ever master such essential skills. Such co-therapy hours are provided by staff trainees, the BCaBA behavior therapist, two behavior therapists working together, and the therapists and parents working together.

In addition to essential therapy activities, there are many interventions that periodically require co-therapy hours simply in order to be practical. For example, picture the mother with four children. Her child, who suffers from autism, has extremely disruptive car behavior – unbuckling his seat belt and attempting to open the car door in transit, as well as biting at his siblings. To remediate this challenge, a single behavior therapist could repeatedly accompany the mother on car trips to establish a schedule of effective reinforcement, but because the mother has to care for her other children, she cannot participate in the intensity necessary to efficiently master this skill. A single therapist could attempt to provide

community outings to establish behavioral control, but would be distracted by the demands of safe driving. Instead the most efficient, practical solution is to have two therapists travel together. One provides the demanding schedule of musical and edible reinforcement, while the second drives. On occasion, the BCaBA behavior therapist will accompany the staff on such a trip, in order to model the currently recommended procedure or give feedback on effective timing of reinforcement and prompts.

Protection from Harm. While the above reasons for adequate supervision are most directly related to cost effectiveness, one essential reason for adequate supervision is safety. Without adequate clinical oversight, bachelor's level staff cannot be expected to automatically anticipate risks, perform procedures in a safe manner, and use the necessary levels of vigilance for danger. For example, many of the activity reinforcers entail risks to the child. Children jump on trampolines, which carry high risks for physical injury. Children swim in pools and at the beach, which carry risks for drowning. Children are attracted to dangerous items such as matches and lawn mowers. Children climb dangerously. Children bolt in the community. Further, when physical guidance is employed, the risks of injury from inappropriate guidance are present. It is only the experienced supervisor who can be counted on to observe a potentially risky situation, anticipate the risks, short-circuit dangerous activities, and train and motivate the necessary vigilance to keep children safe. They must be given the support necessary to afford this essential supervision.

In summary, it is the experienced and skilled Behavior Analyst Clinical Supervisors and BCaBA Behavior Therapists who evaluate the child's medical needs; develop the individualized treatment program; prescriptively evaluate the child's ongoing response to treatment; train parents, staff, and community members in timely implementation of progressively more complex programming; ensure continuity of care among team members; and conduct thorough periodic assessments to ensure accountability. In contrast, the one-to-one behavior therapists average only about one year of experience and are unable to make the timely cost effective analyses and improvements to children's programming. In short, it is the clinical supervisor's role that enables the treatment to be rehabilitative and time-limited, and thus cost-effective. While it is conceivable that a Ph.D. or other licensed professional could deliver these services, it is unlikely to be cost effective with customary fee structures; and the EIBI service is unlikely to be accessible to large numbers of families, when these roles are filled by professionals at this level. Instead the following research establishes the suitability of master's and bachelor's level Behavior Analysts and BCaBA Behavior Therapists in fulfilling these roles.

To be cost-effective, we have found that the clinical supervision is best split between three roles: A Behavior Analyst Clinical Supervisor who has the training and credentials of a master's level Board Certified Behavior Analyst, has five years of experience in an intensive early intervention behavior therapy program, and has passed the competencies to supervise an intensive home-based program for autism. This person provides up to 350 hours of direct supervision to the individual family's treatment program per year. This Behavior Analyst Clinical Supervisor then delegates much of the extensive case-management and staff and parent training to a BCaBA Behavior Therapist, who has at least a year of experience in the intensive early intervention behavior therapy program, and who has mastered the competencies of a four-month internship. This person provides up to 650 hours of direct case-management and staff and parent training to the family per year. In addition, the one-to-one therapists also provide co-therapy hours with each other to conduct essential therapy tasks in the most cost-effective manner. It may not be cost-effective to require senior-level staff to provide these co-therapy hours. The therapists provide up to a total of 1800 hours of such one-to-one therapy per year. As a result of the cost-effective interaction of this comprehensive team, the "direct co-therapy hours" can be kept within 25% of the total hours, thus conforming to standard practices for direct and indirect time.

How many hours should be authorized?

The intensity of treatment of each individual child should be individualized to their own needs, and for varying durations. Some children benefit from a few hours a week for less than six months, and others require many hours a week for several years. When children use a few hours during the week, those hours should be delivered by senior clinicians, and when children are treated more intensively, a higher proportion of junior clinicians can be used, while under frequent direct clinical supervision.

Each child's optimum intensity should be authorized based upon their responsiveness to treatment. This is measured by an ABA system of directly measured short-term objectives every six months. The common ratio of the hours of different direct services is as follows:

Table 1: Average Hours of Intensity of Evidence Based Treatment

	Comprehensive EIBI Treatment		Focused ABA Treatment	Parent and Caregiver ABA Training
	Intensive Phase	Transition Phase		
	Average Hours of Direct Behavior Analyst Services per Six Months			
Periodic Case Review	38	38	26	26
	Average Hours of Direct Behavior Analyst Services per Week			
Behavior Assessment, Analysis, and ITP Development	4	4	1	1
Clinical Direction	3	1	1	0
Parent and Caregiver Training	6	6	6	6
Clinical Consultation and Case Management	2	2	1	2
	Average Hours of Direct Behavior Technician Services per Week			
Behavior Intervention	40	10	10	0

The common ranges of hours delivered, after individualization, are as follows:

Table 2: Common Ranges of Intensity of Evidence Based Treatment Across the Varying Treatment Models

Treatment Model	Behavior Analyst			Behavior Technician		
	Range of Hours per Week		Average	Range of Hours per Week		Average
	Low	High	per Week	Low	High	per Week
All Models	1.5	25	7	2	60	20
Comprehensive Intensive	1.5	25	18	6	60	30
Comprehensive Transition	2	24	8	-	-	-
Focused	2	10	6	2	16	10
Parent Training	1.5	8	2	-	-	-

What are the optimal payment rates for cost-effective hourly authorization?

The following proposed rates are aligned along a similar range as current rates. However they can result in a more cost effective utilization if the restrictions of the current system are eliminated. If payment were to be made using these rates, without the service pattern restrictions, the provider will no longer profit only when delivering the full level of services, while failing to afford the delivery of reduced services or uncompensated supervision patterns. Without service restrictions, the providers will have no disincentive to transition children out of the program, and instead will have an incentive to deliver the optimum (lesser) level of intensity, and to deliver rural services.

Table 3: Proposed cost effective reimbursement rates without arbitrary service restrictions

Weekly Clinical Role					Provider Type	Service	Cost Per Hour	Cost per Role
Supervision	Assessment	Direction	Intervention	Support				
Supervision	Assessment	Direction	Intervention		Professional (CNS-MH; LICSW; LMFT; LPCC; LP; NP; Psychiatrist; BCBA-D)	Behavior Analyst Case Review and Clinical Management	93.00	84.00
Supervision	Assessment	Direction	Intervention		BCBA Behavior Analyst	Behavior Analyst Assessment, Consultation, and Clinical Direction	75.00	
	Assessment	Direction	Intervention		BCaBA Behavior Therapist	Behavior Analyst Assessment, Training and Case Management	56.00	56.00
	Assessment		Intervention		RBT Bachelor's level Behavior Technician	Behavior Therapy and Training	48.00	40.00
	Assessment		Intervention		RBT Associate Degree Behavior Technician	Behavior Therapy	32.00	
				Support	PCA High School Diploma Respite Provider	Respite and Community Supervision	16.24	16.24

What are the disincentives in current payment systems?

The restrictions upon the types of staff that can deliver services, and upon the patterns of staffing should be based on the evidence in ABA and EIBI. Shrewd payment systems can eliminate disincentives to reduce intensity and to transition children out of treatment. They can also reduce disincentives to deliver less intensive focused services. Disincentives occur when the provider is not reimbursed to fully evaluate the child's needs and monitor treatment quality and effectiveness. Disincentives also occur when the provider is not reimbursed for the excess costs of the senior professionals to make a transition to less intense services. They occur when the provider is not reimbursed to deliver rural services because the rate of reimbursement for transportation doesn't match the costs. They also occur when the provider is only reimbursed for one-to-one child services, when less intense parent or caregiver training would be equally effective.

Table 4: Common restrictions on service patterns that create disincentives for optimizing the intensity of treatment.

1. Only certain professionals can bill for clinical supervision, when the evidence in early intervention research shows that the BCBA-level professional can operate effectively as part of a team and supervise parents and other practitioners cost effectively. This reduces accessibility of services because there are very few qualified mental health professionals available to conduct the extensive weekly supervision duties required.
2. The child must be present for every activity, even when discrete parent training or school consultation is advisable. This interferes with effective treatment planning.
3. Two practitioners cannot bill for simultaneous services, even while other professionals can. This arbitrary distinction ignores the evidence base on the qualifications of behavior analyst supervisors, interferes with continuity of care on a regular basis, slows down progress when two therapists are necessary for assessment or intervention, interferes with effective parent training, and interferes with the safety of dangerous children.
4. Case management is not covered. This prevents the team from coordinating the services of multiple persons and multi-disciplinary services.

Review of published research on high intensity supervision and training.

The use of extensive and intensive clinical supervision is pervasive in the rich evidence base of Applied Behavior Analysis. As soon as ABA programs emerged from the laboratory and moved into implementation in large systems, behavior analysts turned their attention to the need for cost-effective supervision and integrated training systems (Christian & Hannah, 1983; Reid, Parsons, & Green, 1989; Paul & Lentz, 1977). As of today, a vast literature of ABA supervision, management, and training exists. Common evidence-based features include regular direct clinical observation, direct-training-based performance management for continuity of care, and system-wide evaluation to ensure cost-effective implementation (Christian, Hannah, & Glahn (1984). Each of these efforts require substantial cost, time and expertise, and therefore the cost-effectiveness of various staffing levels is always found to be paramount (Lovaas & Buch, 1992; Luce, Christian, Anderson, Troy, & Larsson, 1992; Smith, Parker, Taubman, & Lovaas, 1992). Evidence for the medical necessity of these cost-effective levels of direct clinical supervision is continues to be found in research from these foundational studies to today (Green, Rollyson, Passante, & Reid, 2002; LeBlanc, Gravina, & Carr, 2009).

What follows is a review of ABA research on clinical supervision and management services that have been found to be essential to the implementation of medically necessary treatment in early intervention.

Davis, Smith, & Donohoe (2002) described the UCLA supervision model as consisting of a highly experienced Case Supervisor who oversees three to five children. Each of those children in turn has their own BCaBA Therapist who oversees the child's treatment team daily. In addition to extensive experience, the Case Supervisor also has Board Certified Behavior Analyst skills and is supervised weekly by the Project Director. They concluded that it is of considerable importance to have procedures for evaluating supervisors. In this study they found evidence for a variety of components of a comprehensive strategy for doing so. In each of these cases, the direct clinical supervision was provided by Behavior Analyst Clinical Supervisors and BCaBA Behavior Therapists with master's and bachelor's level pre-service training, who delivered their services within an integrated service delivery system.

Lovaas (1987) is one of the earlier large-scale studies of intensity of treatment. Families in that study received "more than 40 hours of one-to-one treatment per week" by "well-trained student therapists." In addition, "the parents worked as part of the treatment team throughout the intervention; they were extensively trained in the treatment procedures so that treatment could take place for almost all of the subjects' waking hours, 365 days a year." In the report itself, the description of supervision and training was put simply: "It is unlikely that a therapist or investigator could replicate our treatment program for the experimental group without prior extensive theoretical and supervised practical experience in one-to-one behavioral treatment." See Table 5 for a summary of the levels of supervision that were specified as

treatment variables in the studies that are most often cited as the best evidence for Early Intensive Behavioral Intervention.

What level of intensity is commonly found effective?

In the studies that are most often cited as the best evidence for comprehensive interventions, and also are the largest studies, in terms of number of participants and length of time studied (Chorpita et al. 2011; Myers & Johnson, 2007; New York State Department of Health, 1999; Rogers & Vismara, 2008; Warren, et al. 2011), the following independent variables (experimental conditions) were compared with less intensive treatments.

Table 5: Evidence-Based Levels of Behavior Analysis and Behavior Therapy in Outcome Studies

Study	Reported Hours of One-to-One Behavior Therapy	Additional Levels of Behavior Analysis, Assessment, and Direction	Parent Training	Clinical Reviews
Lovaas 1987	An average of 40 hours, with frequent co-therapy, range: 10 to 60 hours per week	Daily to weekly direct supervision by direct supervisor, clinical supervisor, and psychologist	The parents also received extensive instruction and supervision on appropriate treatment techniques for 5-8 hours per week	Weekly team clinical review meeting
Cohen et al. 2006	35 to 40 hours	Clinic Supervisors provided ongoing performance feedback	Weekly parent training	Weekly team clinical review meeting & six-month clinical review
Sallows & Graupner 2005	An average of 37 to 39 hours	6 to 10 hours of weekly co-therapy by the senior therapist and weekly supervision by the clinic supervisor	Parents attended weekly team meetings and extended treatment throughout the day	2 weekly 1-hr team clinical and progress review meetings
Howard et al. 2005	35 to 40 hours	Direct observational data reviewed by program supervisors several times per week	Weekly to monthly parent training	
Eikeseth et al. 2002, 2007	28 hours of school-based and additional home-based parent therapy	10 hours per week of apprentice observation and supervision by supervisors, weekly supervision by project directors	4 hours per week of parent training	2 hour meeting weekly
Hayward, et al. 2009	42 hours of scheduled, home- and school-based treatment	5 hours per week of programme consultant supervision. 11 hours per week of senior tutor supervision. 2 hours per month by programme director	2 to 5 hours per week of parent training	2 hour meeting weekly

While data on the extensive level of supervision in Lovaas (1987) was not kept; in a follow-up paper, Lovaas's colleagues (Leaf, Taubman, & McEachin, 2008) described the level of supervision and training,

which went beyond the 40 hours, in detail. “The nineteen children in the intensive treatment group received an average of 40 man-hours of formal ABA intervention weekly. Man-hours were counted because there were sessions with two therapists, done for training purposes and to maximize the instructional time as well as permit teaching observational learning and other skills requiring a second person.” “Each treatment team was supervised by a graduate student in psychology or an advanced undergraduate student. Dr. Lovaas and the clinic supervisor provided clinical oversight.” “After demonstrating a thorough understanding of the principles of ABA, staff attended a series of workshops.” “Staff received further training when they worked with the children. Typically, new staff worked alongside a more experienced staff member for several weeks. Additionally, the supervisor often accompanied staff to provide additional training.” “When a child was progressing slowly, therapy hours were increased to help facilitate progress.” “Supervision occurred on a frequent and ongoing basis (i.e., a minimum of weekly and often daily). Multiple layers of supervision were provided. In addition to the direct supervisor, a clinical supervisor and psychologist provided oversight to each case.” “It was standard practice to have two therapists work every session.” “Over time we have seen that double therapy can have tremendous clinical benefit. Then as now, we find using two therapists can make the sessions more productive in a number of ways:
- Simulation of play dates
- Simulation of school
- Increased opportunities to practice observational learning and group instructions
- Reduced "downtime" during set-up and record keeping, and
- Increase in staff’s skills”

Cohen et al. (2006) qualitatively described the following levels of supervision beyond the research description of 35 to 40 hours per week of one-to-one. “To ensure proficiency in implementing the UCLA model, 5 CVAP staff members each completed 3- to 4-month internships at UCLA, and consultants from UCLA made on-site visits 2 to 4 times per year for the first 3 years of the study period, with frequent telephone contacts between visits (typically once per week).” “Clinic supervisors trained and provided ongoing performance feedback to tutors. Supervisors were graduate students in behavior analysis or master’s level clinicians with 2 or more years of experience in providing EIBT.” “At the beginning of treatment, all parents attended a 12- to 18-hour training workshop across 2 to 3 days on behavioral principles and intervention methods. Thereafter, they participated in weekly training sessions to generalize their child’s newly established skills to the natural environment.”

Sallows and Graupner (2005) provided more quantitative data. They reported the following levels of supervision for an intensive treatment group that averaged 37 to 39 hours per week of one-to-one. A Senior Therapist delivered 6 to 10 hours per week in 3 co-therapy sessions per family. A Clinical Supervisor or Director conducted a weekly 1-hour Clinical Review Meeting. A Team Meeting was held for 1 hour per week. Each staff received 20 hours of PreTraining. Each Senior Therapist received 4 months of continuous co-therapy prior to taking on that role independently. The Clinic Director provided weekly supervision.

Howard et al. (2005) reported 35 to 40 hours per week of one-to-one intervention for children aged 3 and older, with supervision as follows: “Direct observational data on each child’s progress were reviewed by program supervisors several times each week, and intervention procedures were modified as needed.” One-to-one staff “were trained and supervised by staff with master’s degrees in psychology or special education and coursework as well as supervised practical experience in applied behavior analysis with children with autism. Some supervisors were assisted by staff with bachelor’s degrees and (typically) graduate coursework in behavior analysis. Each supervisor was responsible for programming for 5–9 children and worked under the direction of a Board Certified Behavior Analyst who was also a licensed psychologist and a licensed speech and language pathologist. Parents received training in basic behavior analytic strategies, assisted in the collection of maintenance and generalization data, implemented programs with their children outside of regularly scheduled intervention hours, and met with agency staff one to two times a month.” “efforts were made to ensure treatment integrity (e.g., through frequent direct observation and videotaping of staff implementing procedures with children, and frequent feedback from supervisors).”

Eikeseth et al. (2002, 2007) reported on children who received 28 hours per week of school-aged one-to-one services by teachers and therapists, and additional parent treatment at home. “During the study, the therapists received 10 hours per week of supervision in an apprenticeship format: Supervisors set up and implemented treatment programs, and then the therapists implemented these programs and received feedback based on supervisors' in vivo observations of their work.” “They [Supervisors] met weekly with the project directors, each of whom were psychologists with approximately 10 years of experience implementing the UCLA treatment prior to the study.” “Weekly, 2-hour meetings were held for each child. The child, primary caregiver, therapists, supervisor, and director attended.” “Parental participation was considered central to the treatment. As part of their training, parents worked alongside therapists at school for the first 3 months of treatment for a minimum of 4 hours per week.”

Hayward et al. (2009) reported on children who received 42 scheduled hours per week of home-based treatment. “Each child is assigned a programme consultant, providing 5 h per week of supervision, for 46 weeks per year. Supervision is distributed as follows: weekly 2 h team meeting; in home supervision during treatment sessions; school consultations; supervision to the senior tutor; meetings with parents; meetings with school staff and other professionals involved with the child; clinical administrative tasks related to the case, such as programming, task analysis and functional assessment.” “A senior tutor is provided for each child for a minimum of 11 h per week, for 46 weeks of the year. The main duties of the senior tutor are to assist in running team meetings, provide one-to-one teaching and supervise tutors during one-to-one teaching, as well as to conduct related clinical administrative tasks.” “A director also provides supervision to each child, for a minimum of 2 h per month.” “A weekly 2 h team meeting is conducted during which all team members, including parents, participate. During these meetings all team members work with the child on his/her current programmes. This enables the team, and in particular the programme consultant and senior tutor, to provide feedback on teaching procedures and progress. It also enables them to review the curriculum and interventions and revise them for the following week. Detailed notes are typed during the team meeting, based on the conclusions of all advice that was given and discussions that have been held. The team then follows this advice throughout the next week of teaching.” “Close supervision is also provided by programme consultants and directors on ongoing clinical practice and on development of professional and managerial skills, such as working closely with parents and other professionals, making presentations and supervising and appraising tutors.”

Eikeseth et al. (2009) reported a significant correlation between the IQ gains and the intensity of supervision of children served by intensive parent-managed services. In these outreach services, children received an average of 34 hours per week of one-to-one treatment, and the level of supervision ranged from 2.9 to 7.8 hours per month. The level of supervision correlated at .45 with the change in IQ over the first 14 months of treatment, producing an average gain of .21 IQ points per hour of supervision. The average IQ gain was 17 points. Eikeseth concluded, “intensity of supervision together with intensity of treatment, treatment method, and pretreatment functioning are variables that may affect outcome for children with autism who receive early and intensive behavioral intervention.”

Research on treatment with low levels of supervision. For comparison purposes, Leaf, Taubman, & McEachin (2008) summarized the components of high intensity supervision as follows: Staff hired and trained by agency; One to two months of pre-training; Weekly and sometimes daily supervision; Weekly Clinical Review Meetings; High level of expertise in Clinical Supervision. In contrast, they summarized low intensity supervision as being comprised of: Staff hired by parents; Staff trained through consultation; Three days of pre-training; Monthly to quarterly consultation; Monthly to quarterly Clinical Review Meetings; Poorly controlled supervisor expertise. In comparison to the high intensity studies reviewed above, several studies of low intensity supervision have also been conducted. In each of these studies, the levels of recovery from autistic symptoms have been much less (Smith, Buch, & Gamby, 2000; Smith, Groen, & Wynn, 2000; Remington, et al., 2007). In some reports of early intervention where limited gains were found (Bibby, et al., 2002; Magiati, et al., 2007), the reported levels of supervision have been as low as only once every 3 months.

Smith and Wynn (2003) described the preliminary results of the long-term replication study of the Lovaas (1987) results. In describing the control group treatment of low intensity supervision workshops, “it appears that the percentage of children who achieve normal functioning (average levels of intelligence and satisfactory, unassisted performance in a class for typically developing children) is estimated at closer to

10% or 20% rather than the 47% reported for clinic-based treatment at UCLA (Lovaas, 1987). This lower rate may reflect such factors as high staff turnover, less frequent supervision than that which occurs in clinic-based treatment, and the use of aides with less academic background in learning-based theory and research than those provided by UCLA, LIFE, and replication sites."

Lovaas and Smith (2003) described the standard Lovaas multi-site replication protocol for supervision and training as a result of the above research: "In clinic-based services each member of the child's team, Student Therapists, Senior Therapist, Case Supervisor and Clinic Supervisor, has passed quality control. Each child is reviewed in weekly Clinic Meetings of one to two hour duration." "A Senior Therapist may not be able to effectively supervise the treatment of more than 2 children, each receiving a total of 40 hours of one-on-one treatment per week. A Case Supervisor supervises about 4 children providing no less than 4 hours supervision per child per week in cooperation with a child's Senior Therapist and helps train Student Therapists. It is our experience that a Clinic Director can provide effective supervision of no more than 14 children at any one time given that 14 children would be receiving 560 hours of treatment per week. Both Case and Clinic Supervisors are available to the child's parents to help answer questions about treatment, assist in staff training and participate in research. The intensity and close supervision of the treatment provide opportunities for identifying ineffective and harmful treatments and development and testing of effective ones."

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Section 5.0

Guidelines

Rehabilitation Guideline for May VBBS

Question: How should the rehabilitation guideline note be revised?

Question source: HERC staff

Issue: The current rehabilitation guideline was discussed at the March, 2014 VBBS meeting. The VBBS determined that the differential number of visits based on age should be replaced with a general number of visits per year. Additional visits might be considered in specific cases. Requirements for documented progress should be included in the new guideline. Other PT/OT guidelines from statewide commercial plans as well as Medicare were reviewed at this meeting.

HERC staff was charged with revising the guideline note to reflect the March VBBS discussion.

Current guideline:

GUIDELINE NOTE 6, REHABILITATIVE THERAPIES

Lines 37,50-52,64,74-76,78,80,85,89,90,94,95,98-101,108,109,115,116,122,129,139,141-143,145,146,158,161,167,179,184,185,189,190,192,194,195,201,202,208,209,216,226,237,239,270,271,273,274,279,288,289,293,297,302,304,307-309,318,336,342,349,350,363,367,369,375,376,378,382,384,385,387,400,406, 407,434,441,443,448,455,467,478,489,493,507,516,535,549,562,580,597,619,638

Physical, occupational and speech therapy, and cardiac and vascular rehabilitation, are covered for diagnoses paired with the respective CPT codes, depending on medical appropriateness, for up to 3 months immediately following stabilization from an acute event.

Following the 3 month stabilization after an acute event, or, in the absence of an acute event, the following number of combined physical and occupational therapy visits are allowed per year, depending on medical appropriateness:

- Age < 8: 24
- Age 8-12: 12
- Age > 12: 2

And the following number of speech therapy visits are allowed per year, depending on medical appropriateness (with the exception of swallowing disorders, for which limits do not apply):

- Age < 8: 24
- Age 8-12: 12
- Age > 12: 2

Whenever there is a change in status, regardless of age, such as surgery, botox injection, rapid growth, an acute exacerbation or for evaluation/training for an assistive communication device, the following additional visits are allowed:

- 6 visits of speech therapy and/or
- 6 visits of physical or occupational therapy

No limits apply while in a skilled nursing facility for the primary purpose of rehabilitation, an inpatient hospital or an inpatient
rehabilitation unit.

HERC staff recommendation:

1) Revise the Rehabilitative Therapies guideline as shown below

GUIDELINE NOTE 6, REHABILITATIVE THERAPIES
Lines 37,50-52,64,74-76,78,80,85,89,90,94,95,98-101, 108, 109, 115, 116, 122, 129, 139, 141-143,145,146,158,161,167,179,184,185,189, 190, 192, 194, 195, 201, 202, 208, 209,216,226,237,239,270,271,273,274,279,288,289,293,297,302,304,307-309, 318, 336,342,349, 350, 363, 367, 369, 375,376,378, 382,384,385,387, 400,406, 407, 434, 441,443,448,455,467,478,489,493,507,516,535,549,562, 580, 597,619,638

Up to 30 p~~P~~hysical, occupational and speech therapy, and cardiac and vascular rehabilitation, are covered per year for diagnoses paired with the respective CPT codes. Additional visits, not to exceed 30 visits per year, may be authorized in exceptional circumstances, such as in cases of rapid growth/development, surgery, or acute exacerbation of a condition. Therapy is only covered when the following criteria are met:~~, depending on medical appropriateness, for up to 3 months immediately following stabilization from an acute event~~.

~~Following the 3 month stabilization after an acute event, or, in the absence of an acute event,~~

1) therapy is provided by a licensed physical therapist, occupational therapist, speech language pathologist, physician, or other practitioner licensed to provide physical, occupational, or speech therapy,
2) there is objective, measurable documentation of progress toward the therapy plan of care goals and objectives,
3) the therapy plan of care requires the skills of a therapist, and
4) the client and/or caregiver cannot be taught to carry out the therapy regimen independently.

~~the number of combined physical and occupational therapy visits are allowed per year, depending on medical appropriateness~~

~~• Age < 8: 24~~
~~• Age 8-12: 12~~
~~• Age > 12: 2~~

~~And the following number of speech therapy visits are allowed per year, depending on medical appropriateness (with the exception of swallowing disorders, for which limits do not apply):~~

~~• Age < 8: 24~~
~~• Age 8-12: 12~~
~~• Age > 12: 2~~

~~Whenever there is a change in status, regardless of age, such as surgery, botox injection, rapid growth, an acute exacerbation or forevaluation/training for an assistive communication device, the following additional visits are allowed:~~

~~• 6 visits of speech therapy and/or~~
~~• 6 visits of physical or occupational therapy~~

No limits apply while in a skilled nursing facility for the primary purpose of rehabilitation, an inpatient hospital or an inpatient rehabilitation unit.

(New guideline without track changes)

GUIDELINE NOTE 6, REHABILITATIVE THERAPIES

Lines 37,50-52,64,74-76,78,80,85,89,90,94,95,98-101, 108, 109, 115, 116, 122, 129, 139, 141-143,145,146,158,161,167,179,184,185,189, 190, 192, 194, 195, 201, 202, 208, 209,216,226,237,239,270,271,273,274,279,288,289,293,297,302,304,307-309, 318, 336,342,349, 350, 363, 367, 369, 375,376,378, 382,384,385,387, 400,406, 407, 434, 441,443,448,455,467,478,489,493,507,516,535,549,562,580, 597,619,638

Up to 30 physical, occupational and speech therapy, and cardiac and vascular rehabilitation, are covered per year for diagnoses paired with the respective CPT codes. Additional visits, not to exceed 30 visits per year, may be authorized in exceptional circumstances, such as in cases of rapid growth/development, surgery, or acute exacerbation of a condition. Therapy is only covered when the following criteria are met:

1) therapy is provided by a licensed physical therapist, occupational therapist, speech language pathologist, physician, or other practitioner licensed to provide physical, occupational, or speech therapy,
2) there is objective, measurable documentation of progress toward the therapy plan of care goals and objectives,
3) the therapy plan of care requires the skills of a therapist, and
4) the client and/or caregiver cannot be taught to carry out the therapy regimen independently.

No limits apply while in a skilled nursing facility for the primary purpose of rehabilitation, an inpatient hospital or an inpatient rehabilitation unit.

Treatment of sleep apnea in adults - guideline revision

Question: Should the recently approved guideline on sleep apnea in adults be revised?

Question source: Christine Seals, MD, Tracy Muday, MD, and other Medical Directors from CCOs

Issue: On 1/9/14 HERC approved Prioritized List changes regarding the treatment of sleep apnea in adults, based on an approved Coverage Guidance. The CCO Medical Directors have had concerns with the proposed and approved language. They are most concerned with the allowance of coverage for an AHI from 5 to 14 in the face of limited evidence. They suggested adding language that would clarify the coverage of CPAP for this AHI range if sleep disturbance is not otherwise explainable or is important for functioning.

Additionally, Tracy Muday noted there are still some remaining surgical codes on the OSA line in the April 1 List, which may be in conflict with the new recommendation to not cover surgery. How the comorbidity rule may apply to this also needs clarification.

Current Prioritized List Status

Line: 210
Condition: SLEEP APNEA AND NARCOLEPSY (See Coding Specification Below) (See Guideline Notes 27,64,65,76,118)
Treatment: MEDICAL AND SURGICAL TREATMENT
ICD-9: 278.03,327.20-327.21,327.23-327.29,347.00-347.01,780.51,780.53,780.57
CPT: 21193-21235,30117,30140,30520,31600-31610,31820,31825,42140-42160,42820-42836,94660,96150-96154,98966-98969,99051,99060,99070,99078,99201-99239,99281-99360,99366,99374,99375,99379-99412,99429-99449,99471-99476,99487-99496,99605-99607
HCPCS: G0396,G0397,G0406-G0408,G0425-G0427,G0463

42299 Unlisted procedure, palate, uvula (use for laser assisted uvulopalatoplasty (LAUP), somnoplasty, palatal implants) does not pair on Line 210 with obstructive sleep apnea in adults.

GUIDELINE NOTE 118, OBSTRUCTIVE SLEEP APNEA DIAGNOSIS AND TREATMENT FOR CHILDREN

Line 210

Obstructive sleep apnea (OSA) in children (18 or younger) must be diagnosed by

1. nocturnal polysomnography with an AHI >5 episodes/h or AHI>1 episodes/h with history and exam consistent with OSA, OR
2. nocturnal pulse oximetry with 3 or more SpO2 drops <90% and 3 or more clusters of desaturation events, or alternatives desaturation (>3%) index >3.5 episodes/h, OR
3. use of a validated questionnaire (such as the Pediatric Sleep Questionnaire or OSA 18), OR
4. consultation with a sleep medicine specialist.

Polysomnography and/or consultation with a sleep medicine specialist to support the diagnosis of OSA and/or to identify perioperative risk is recommended for

1. high risk children (i.e. children with cranio-facial abnormalities, neuromuscular disorders, Down syndrome, etc.)
2. children with equivocal indications for adenotonsillectomy (such as discordance between tonsillar size on physical examination and the reported severity of sleep-disordered breathing),
3. children younger than three years of age

Adenotonsillectomy is an appropriate first line treatment for children with OSA. Weight loss is recommended in addition to other therapy in patients who are overweight or obese.

Intranasal corticosteroids are an option for children with mild OSA in whom adenotonsillectomy is contraindicated or for mild postoperative OSA.

CPAP is covered for a 3 month trial for children through age 18 who have

1. undergone surgery or are not candidates for surgery, AND
2. have documented residual sleep apnea symptoms (sleep disruption and/or significant desaturations) with residual daytime symptoms (daytime sleepiness or behavior problems)

CPAP will be covered for children through age 18 on an ongoing basis if:

1. There is documentation of improvement in sleep disruption and daytime sleepiness and behavior problems with CPAP use
2. Annual re-evaluation for CPAP demonstrates ongoing clinical benefit and compliance with use, defined as use of CPAP for at least four hours per night on 70% of the nights in a consecutive 30 day period.

Prioritized list changes approved by HERC 1/9/2014:

GUIDELINE NOTE 27, TREATMENT OF SLEEP APNEA IN ADULTS

Line 210

CPAP is covered initially when all of the following conditions are met:

- 12 week 'trial' period to determine benefit. This period is covered if apnea-hypopnea index (AHI) or respiratory disturbance index (RDI) is greater than or equal to 15 events per hour; or if between 5 and 14 events with additional symptoms including one or more of the following:
  - excessive daytime sleepiness (Epworth Sleepiness Scale score > 10), or
  - documented hypertension, or
  - ischemic heart disease, or
  - history of stroke;
- Providers must provide education to patients and caregivers prior to use of CPAP machine to ensure proper use; and
- Positive diagnosis through polysomnogram (PSG) or Home Sleep Test (HST).

CPAP coverage subsequent to the initial 12 weeks is based on documented patient tolerance, compliance, and clinical benefit. Compliance (adherence to therapy) is defined as use of CPAP for at least four hours per night on 70% of the nights during a consecutive 30 day period.

Mandibular advancement devices (oral appliances) are covered for those for whom CPAP fails or is contraindicated.

Surgery for sleep apnea in adults is not covered.

HERC Staff Recommendations:

1) Remove surgical codes from Line 210

Code	Description	Recommendation
21193	Reconstruction of mandibular rami, horizontal, vertical, C, or L osteotomy; without bone graft	**Remove from 210**. (Remains only on line 646)
21194	Reconstruction of mandibular rami, horizontal, vertical, C, or L osteotomy; with bone graft (includes obtaining graft)	**Remove from 210.** (Remains only on line 646)
21195	Reconstruction of mandibular rami and/or body, sagittal split; without internal rigid fixation	**Remove from 210.** (Remains only on line 646)
21196	Reconstruction of mandibular rami and/or body, sagittal split; with internal rigid fixation	**Remove from 210**. (Remains only on line 646)
21198	Osteotomy, mandible, segmental;	**Remove from 210.** (Remains only on line 646)
21199	Osteotomy, mandible, segmental; with genioglossus advancement	**Remove from 210. Place on Line 646 only.**
21206	Osteotomy, maxilla, segmental (eg, Wassmund or Schuchard)	**Remove from 210**. (Remains only on line 646)
21208	Osteoplasty, facial bones; augmentation (autograft, allograft, or prosthetic implant)	**Remove from 210.** (Remains only on line 646)
21209	Osteoplasty, facial bones; reduction	**Remove from 210.** (Remains only on line 646)
21210	Graft, bone; nasal, maxillary or malar areas (includes obtaining graft)	**Remove from 210.** (Remains on lines 242,612,673).
21215	Graft, bone; mandible (includes obtaining graft)	**Remove from 210.** (Remains on lines 242,612,673).
21230	Graft; rib cartilage, autogenous, to face, chin, nose or ear (includes obtaining graft)	**Remove from 210**. (Remains on line 673).
21235	Graft; ear cartilage, autogenous, to nose or ear (includes obtaining graft)	**Remove from 210**. (Remains on 405,673).
30117	Excision or destruction (eg, laser), intranasal lesion; internal approach	**Remove from 210**. (Remains on multiple other lines)
30140	Submucous resection inferior turbinate, partial or complete, any method	**Remove from 210.** (Remains on multiple other lines)
30520	Septoplasty or submucous resection, with or without cartilage scoring, contouring or replacement with graft	**Remove from 210.** (Remains on multiple other lines)
31600	Tracheostomy, planned (separate procedure);	No change. Rare, but occasionally necessary in cases of respiratory failure such as with neuromuscular disease.
31601	Tracheostomy, planned (separate procedure);	No change.

Code	Description	Recommendation
	younger than 2 years	
31603	Tracheostomy, emergency procedure; transtracheal	No change.
31605	Tracheostomy, emergency procedure; cricothyroid membrane	No change.
31610	Tracheostomy, fenestration procedure with skin flaps	No change.
31820	Surgical closure tracheostomy or fistula; without plastic repair	No change.
31825	Surgical closure tracheostomy or fistula; with plastic repair	No change.
42140	Uvulectomy, excision of uvula	**Remove from 210.** **Place on DMAP Excluded File**.
42145	Palatopharyngoplasty (eg, uvulopalatopharyngoplasty, uvulopharyngoplasty)	**Remove from 210.** Will remain on 71 and 325
42160	Destruction of lesion, palate or uvula (thermal, cryo or chemical)	**Remove from 210.** (Remains on 656).
42820	Tonsillectomy and adenoidectomy; younger than age 12	No change. Covered for children and adolescents per Guideline Note 118.
42821	Tonsillectomy and adenoidectomy; age 12 or over	No change. As per 42821.
42825	Tonsillectomy, primary or secondary; younger than age 12	No change. As per 42821.
42826	Tonsillectomy, primary or secondary; age 12 or over	No change. As per 42821.
42830	Adenoidectomy, primary; younger than age 12	No change. As per 42821.
42831	Adenoidectomy, primary; age 12 or over	No change. As per 42821.
42835	Adenoidectomy, secondary; younger than age 12	No change. As per 42821.
42836	Adenoidectomy, secondary; age 12 or over	No change. As per 42821.

2) Consider modifying Guideline Note 27 as follows:

GUIDELINE NOTE 27, TREATMENT OF SLEEP APNEA IN ADULTS

Line 210

CPAP is covered initially when all of the following conditions are met:

- 12 week 'trial' period to determine benefit. This period is covered if apnea-hypopnea index (AHI) or respiratory disturbance index (RDI) is greater than or equal to 15 events per hour; or if between 5 and 14 events with additional symptoms including one or more of the following:
    - excessive daytime sleepiness defined as either an Epworth Sleepiness Scale score>10 or daytime sleepiness interfering with ADLs, that is not attributable to another modifiable sedating condition (e.g. narcotic dependence), or

  - documented hypertension, or
  - ischemic heart disease, or
  - history of stroke;
- Providers must provide education to patients and caregivers prior to use of CPAP machine to ensure proper use; and
- Positive diagnosis through polysomnogram (PSG) or Home Sleep Test (HST).

CPAP coverage subsequent to the initial 12 weeks is based on documented patient tolerance, compliance, and clinical benefit. Compliance (adherence to therapy) is defined as use of CPAP for at least four hours per night on 70% of the nights during a consecutive 30 day period.

Mandibular advancement devices (oral appliances) are covered for those for whom CPAP fails or is contraindicated.

Surgery for sleep apnea in adults is not covered (due to lack of evidence of efficacy). Tonsillectomy and adenoidectomy codes are included on this line only for children who meet criteria according to Guideline Note 118 OBSTRUCTIVE SLEEP APNEA DIAGNOSIS AND TREATMENT IN CHILDREN.

Fluoride varnish guideline revision

Question: Fluoride varnish guideline revision

Question source: Deborah Loy, Capitol Dental Care

Issue:
Deborah Loy submitted a letter about fluoride varnish coverage in medical settings (see letter) expressing concerns about coverage of varnish in medical settings in adolescents up to age 18. There was concern about decreasing dental visits because this service was provided in medical offices, as well as inappropriate application in lower risk patients.

Prioritized List background
At the August 8, 2013 VBBS meeting, the D1206 code was added to Lines 3 and 4 (3 only on the ICD-10 List).

Code	Code Description	Current Lines
D1206	Topical application of fluoride varnish	57,3
D1208	Topical application of fluoride	57 PREVENTIVE DENTAL SERVICES

8/8/2013
The evidence reviewed included a MED 2009 report and the ADA 2006 guidelines on the efficacy of fluoride varnish.

1) **MED 2009**
    a. Evidence based review
    b. Good evidence of effectiveness of fluoride varnish twice per year through age 16
2) **American Dental Association 2006**
    a. Recommends fluoride varnish through age 18 for moderate and high risk children twice per year

The adopted guideline note was as follows:

> **GUIDELINE NOTE 17, PREVENTIVE DENTAL CARE**
> *Lines 3,4,58*
>
> Dental cleaning is limited to once per 12 months for adults and twice per 12 months for children up to age 19 (D1110, D1120). More frequent dental cleanings may be required for certain higher risk populations. Additionally, assessment (D0191) may be performed once per 12 months for adults and twice per 12 months for children up to age 19.
>
> Fluoride varnish (D1206) is included on Lines 3 and 4 for use with children 18 and younger during well child preventive care visits. Fluoride

treatments (D1206 and D1208) are included on line Line 58 PREVENTIVE DENTAL SERVICES for use with adults and children during dental visits. The total number of fluoride applications provided in all settings is not to exceed four per twelve months for a child at high risk for dental caries and two per twelve months for a child not at high risk. The number of fluoride treatments is limited to once per 12 months for average risk adults and up to four times per 12 months for high risk adults.

Evidence review on the application of fluoride varnish in medical settings

USPSTF, 2013 DRAFT Assessment of benefit

1. The USPSTF concludes with moderate certainty that there is a moderate net benefit to prescribing oral fluoride supplementation at recommended doses starting at age 6 months to children with inadequate fluoride in their water, and there is a moderate net benefit to applying fluoride varnish to the primary teeth of infants and children starting at the age of primary tooth eruption.
2. The USPSTF found adequate evidence that primary care clinicians can effectively identify dental caries in children age 5 years or younger; however, the USPSTF found inadequate evidence on the effectiveness of screening to improve outcomes and on the harms of screening or treatment. Therefore, the USPSTF concluded that the evidence on the benefits and harms of screening is lacking, and the balance of benefits and harms could not be determined.

USPSTF, 2013 DRAFT Recommendation statement

1. The U.S. Preventive Services Task Force (USPSTF) recommends that primary care clinicians prescribe oral fluoride supplementation starting at age 6 months for children whose water supply is deficient in fluoride, and apply fluoride varnish to the primary teeth of infants and children starting at the age of primary tooth eruption. **B recommendation.**
2. The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of routine screening for dental caries in children from birth to age 5 years by primary care clinicians. **I statement.**

Pahel, 2011

1. Claims review
2. Involved entire North Carolina Medicaid program, childrens aged 72 months or younger from 2000 through 2006.
3. Results: “Children enrolled in North Carolina Medicaid with ≥ 4 IMB visits experienced, on average, a 17% reduction in dental-caries-related treatments up to 6 years of age compared with children with no IMB visits. When we simulated data for initial IMB visits at 12 and 15 months of age,

there was a cumulative 49% reduction in caries-related treatments at 17 months of age. The cumulative effectiveness declined because of an increase in treatments from 24 to 36 months, an increase in referrals for dental caries occurred with increasing time since fluoride application, and emergence of teeth not initially treated with fluoride."

4. Conclusions:
    a. Reduced caries related treatments for children with ≥ 4 IMB visits. Multiple applications of fluoride at the time of primary tooth emergence seem to be most beneficial. Referrals to dentists for treatment of existing disease detected by physicians during IMB implementation limited the cumulative reductions in caries-related treatments, but also contributed to improved oral health.

Stearns, 2012

1. Cost effectiveness analysis
2. Into the Mouths of Babes – model in North Carolina involving screening, parental counseling, topical fluoride application, and referral to dentists, if needed
3. N = 209 285 children enrolled in Medicaid at age 6 months. Compared children with 4 or more vs 0 IMB visits
4. Results: "Into the Mouths of Babes is 32% likely to be cost-saving, with discounting of benefits and payments. On average, IMB visits cost $11 more than reduced dental treatment payments per person. The program almost breaks even if future benefits from prevention are not discounted, and it would be cost-saving with certainty if IMB services could be provided at $34 instead of $55 per visit. The program is cost-effective with 95% certainty if Medicaid is willing to pay $2331 per hospital episode avoided."

<u>Recommendations from others</u>

Health Resources and Services Administration (HRSA)

- One of HRSA's top strategic priorities and a goal of the 2010-2015 HHS Strategic Plan is the integration of oral health into primary care

AAPD, 2012

Guideline on Infant Oral Health Care

1. *Oral health risk assessment:* Every infant should receive an oral health risk assessment from his/her primary health care provider or qualified health care professional by six months of age.
2. *Establishment of a dental home:* Parents should establish a dental home for infants by 12 months of age.
3. Health care professionals and all other stakeholders in children's oral health should support the identification of a dental home for all infants by 12 months of age.

4. Professionally-applied topical fluoride, such as fluoride varnish, should be considered for children at risk for caries

Bright Futures Guideline Promoting Oral Health

1. Encourage establishment of dental home by age 1
2. Oral health risk assessment in primary care office by age 6 months (policy adopted 2003)
3. In the absence of a dental home program that is able to see the 1- to 4-year-old child, the primary care child health care professional should continue to perform oral health risk assessments in the 1- to 4-year-old child.
4. The AAPD also recommends that health care professionals use the Caries-Risk Assessment Tool (CAT) beginning at age 1 year (Table 1) as part of the oral risk assessment.
5. Some child health care professionals also may provide enhanced oral health counseling or apply fluoride varnish to help with caries prevention in high risk children

HERC staff assessment

The guideline enables coverage of varnish in medical offices for up to ages 18. This is based on evidence up to age 16 in moderate and high risk children and adolescents and the ADA professional guidelines support this, and extend the age up to 18. The 16 to 18 age gap is not supported by evidence, however, there is evidence of efficacy for under 16, the cost is relatively low, and harms are few and 18 is more consistent with other age cutoffs in the Prioritized List.

Medicaid eligibility (i.e. low socioeconomic status) is one of the qualifying definitions of moderate to high risk for which varnish is indicated. All patients under OHP would thus meet this definition of risk.

There is good data that varnish application in primary care settings is effective, and possibly cost-saving. Recommending establishment with a dental provider is part of the risk assessment and fluoride varnish treatment.

HERC Staff Recommendations:

1) Make no change to the current guideline

February 11, 2014

Oregon Health Policy & Research
Health Evidence Review Commission
1225 Ferry Street
Suite C
Salem, Oregon 97301

RE: Dental Procedure Codes D01206, D0145, and D0191

Dear Darren Coffman:

The Health Evidence Review Commission (HERC) has made some recent decisions regarding dental procedure coverage and line placement. I do not feel these decisions have necessarily included input from the Oral Health Advisory Panel (OHAP) and/or if they were discussed the subjects were not well vetted before HERC made a decision. There is a great deal of broad based oral health expertise on the advisory panel to not use it to full advantage.

A decision was made by the HERC to expand coverage in a medical setting of fluoride varnish D1206 up through age 18. As an oral health advisory panel member I do not dispute the evidence and value of fluoride varnish in a medical setting for younger children. It is questionable on its impact for older school age children. This HERC decision was made without input from the OHAP. Having a dental home is a key factor in a child's oral health. It is for this reason that the American Academy of Pediatrics 'Oral Health Risk Assessment Tool' lists 'existing dental home' first on its 'protective factors'. Oregon Health Plan (OHP) utilization shows low penetration rates for young children however, penetration numbers rise significantly for school aged children.

Families covered under OHP struggle with environmental barriers (i.e. transportation, time off from work/school, arranging child care for children not scheduled to be seen etc.). It is for these reasons that medical-dental collaboration surrounding the young child is seen as a best practice. Young children during the first years of life are seeing medical providers for well child checks and immunizations. Incorporating oral health assessment, anticipatory guidance and fluoride varnish during these visits makes good practical sense. It makes less sense to do so with older children and potential confuse parents or through the convenience of not having to seek services from yet one more provider (a dentist) negatively impact either an established dental home or motivation to acquire one. If I am a stressed out mom and my medical provider looks into my child's mouth, gives some hygiene instructions and applies fluoride varnish I am going to think why do I have to make that 'extra visit' to see the dentist.

A medical provider should need to do an oral health risk assessment in order to bill D01206. If a child has an existing dental home (at age?? to be determined in conjunction with input from the OHAP) the OHP member should be found low risk and fluoride varnish in a medical setting after that age would not be covered. If the child does not have an existing dental home vanish would be covered. However, in addition to applying varnish the medical provider would need to make a referral to the coordinated care organization (CCO) for a dental home to be established. One of the CCO metrics being proposed is dental service penetration. Services delivered by a medical provider are not per Medicaid counted as dental services they are oral health services. The CCO has a wonderful opportunity to coordinate care across delivery systems. The HERC's decision to cover fluoride varnish in a medical setting for the older age child seems counter intuitive to Triple Aim goals of better care, services and lower costs. Tearing down delivery system silos versus building new ones is a vision of transformation.

Another decision by the HERC was to place D0145 (oral evaluation for a patient under three years of age) on a medical line to cover this procedure being done by medical providers. I wholeheartedly disagree with this decision. With the Health Insurance Portability and Accountability Act (HIPPA) it not only included privacy rules but also mandated use of national coding standards. For dental that would be the American Dental Association (ADA) Current Dental Terminology (CDT) coding manual. In the CDT under the 'Diagnostic' section are found the clinical evaluation codes. The evaluation codes descriptors state 'the codes in this section recognize the cognitive skills necessary for **patient evaluation**. The collection and recording of some data and components of the dental examination may be delegated, however, the **evaluation, which includes diagnosis and treatment planning, is the responsibility of the dentist…**

The CDT is a copy-write manual. No other procedure code descriptors other than the evaluation codes so clearly calls out the dentist and him/her not delegating this diagnostic component. These evaluation codes are not simply an assessment and/or screening they encompasses the full breadth of dental diagnosing, and treatment planning including development of a preventive oral health regimen. Although I have the utmost respect for the cognitive skills of medical providers the ADA code descriptor requirements of D0145 cannot be met by a medical provider.

Under the OHP and any other Medicaid program requirements a provider must bill the '**most accurate code**' that describes the service delivered. ADA recognized the importance of non-dentists in conducting oral health pre-diagnostic services such as screening and/or assessment. Unlike the evaluation codes the new screening and assessment codes can be done by non-dentists (i.e. medical and/or mid-level dental providers). My recommendation is that HERC remove D0145 from a medical line and instead D0191 (assessment of a patient) described as 'a limited clinical inspection that is performed to identify possible signs of oral or systemic disease, malformation, or injury, and the potential need for referral for diagnosis and treatment should be added to a medical line in its place.

Although Oregon does allow physicians to do dental services it does not relieve a medical provider from being held to the cognitive skills and standard of care expected to do the service as described. It also does not relieve a provider from billing the most accurate code that describes the service. It makes dill or beans to me if some states are allowing medical providers to bill D0145. Many states made this well intentioned but ill resulted decision trying to fill a void of not having any other dental screening and/or assessment codes to choose from. That is not the case today with D0190 and D0191 added to the CDT coding manual. I feel medical providers should be paid in addition to a well child check for doing D0191.

In closing, many in dental have anxiously awaited risk assessment codes. The new risk assessment codes are D0601 (low), D0602 (moderate) and D0603 (high) risk come with a flurry of expectations. The risk assessment that will take place in a medical setting will look very different than those in a dental setting. The average medical encounter has a lot to squeeze in a limited duration of time. Dental will be working out what we hope to see done in utilizing risk assessment codes. Some of those decisions will need additional evidence and debate. Medical on the other hand has an acceptable tool in the oral health risk assessment proposed by the American Academy of Pediatrics. This is the same tool recommended by 'Smiles for Life' a training program with wide support from the medical community. I would recommend its use for medical providers.

I have recommended to the Division of Medical Assistance Programs that medical provider has oral health training available to them similar to what is done in other states. Oregon's 'First Tooth' program or 'Smiles for Life' could be the training curriculum for medical providers. A medical provider who wishes to receive higher reimbursement for oral prevention codes would in states like Washington and North Carolina be required to complete training. Ones who do not want to complete training still may bill the codes but will not be reimbursed at the higher level.

I sincerely hope the HERC reconsiders recent decisions and reconvenes the OHAP for further discussion and vetting.

Sincerely,

Deborah Loy
Capitol Dental Care

SPECIAL JADA INSERT

ADA

American Dental Association
www.ada.org

Professionally Applied Topical Fluoride
Executive Summary of Evidence-Based Clinical Recommendations

The ADA Council on Scientific Affairs

May 2006

These evidence-based clinical recommendations were developed by an expert panel established by the American Dental Association Council ou Scientific Affairs (CSA) that evaluated the collective body of scientific evidence on the effectiveness of professionally applied topical fluoride for caries prevention. The recommendations are intended to assist dentists in clinical decision-making. The dentist, knowing the patient's health history and vulnerability to oral disease, is in the best position to make treatment decisions in the interest of each patient. For this reason, evidence-based clinical recommendations are intended to provide guidance and are not a standard of care, requirements or regulations. These clinical recommendations must be balanced with the practitioner's professional expertise and the individual patient's preferences.

MedLine and the Cochrane Database of Systematic Reviews were searched for systematic reviews and clinical studies of professionally applied topical fluoride—including gel, foam and varnish forms—through October 2005. The American Dental Association Council on Scientific Affairs formed a panel of experts to evaluate the collective evidence and develop these clinical recommendations. Panelists were selected on the basis of their expertise in the relevant subject matter. They were required to sign a disclosure stating that neither they nor their spouse or dependent children had a significant financial interest that would reasonably appear to affect the development of these recommendations. The panel's recommendations are detailed in a document titled "Professionally Applied Topical Fluoride: Evidence-Based Clinical Recommendations," for which this is the executive summary. The document was submitted for review to scientists with expertise in fluoride and caries, ADA agencies and 46 organizations representing academia, professional organizations, industry and third-party payers. The clinical recommendations are approved by the ADA Council on Scientific Affairs.

GRADING THE EVIDENCE AND CLASSIFYING THE STRENGTH OF THE RECOMMENDATIONS

The scientific evidence was classified according to the following format:

GRADE	CATEGORY OF EVIDENCE
Ia	Evidence from systematic reviews of randomized controlled trials
Ib	Evidence from at least one randomized controlled trial
IIa	Evidence from at least one controlled study with out randomization
IIb	Evidence from at least one other type of quasi-experimental study
III	Evidence from non-experimental descriptive studies, such as comparative studies, correlation studies, and case-control studies
IV	Evidence from expert committee reports or opinions or clinical experience of respected authorities

The strength of the recommendations were classified according to the following format:

CLASSIFICATION	STRENGTH OF RECOMMENDATIONS
A	Directly based on category I evidence
B	Directly based on category II evidence or extrapolated recommendation from category I evidence
C	Directly based on category III evidence or extrapolated recommendation from category I or II evidence
D	Directly based on category IV evidence or extrapolated recommendation from category I, II, or III evidence

Amended with permission of BMJ Publishing Group from Shekelle PG, Woolf SH, Eccles M, Grimshaw J. Clinical guidelines: developing guidelines. Brit Med J 1999;318(7183):593-96.

PANEL CONCLUSIONS BASED ON THE EVIDENCE

The following evidence statements and corresponding classification of evidence (in parentheses) represent the conclusions of the expert panel.

1. Fluoride gel is effective in preventing caries in school-aged children (Ia).

2. Patients whose caries risk is low, as defined in this document, may not receive additional benefit from professional topical fluoride application (Ia).

3. There are considerable data on caries reduction for professionally applied topical fluoride gel treatments of 4 minutes or more (Ia). In contrast, there is laboratory, but no clinical equivalency data on the effectiveness of 1-minute fluoride gel applications (IV).

4. Fluoride varnish applied every six months is effective in preventing caries in the primary and permanent dentition of children and adolescents (Ia).

5. Two or more applications of fluoride varnish per year are effective in preventing caries in high-risk populations (Ia).

6. Fluoride varnish applications take less time, create less patient discomfort and achieve greater patient acceptability than does fluoride gel, especially in preschool-aged children (III).

7. Four-minute fluoride foam applications, every 6 months, are effective in caries prevention in the primary dentition and newly erupted permanent first molars (Ib).

8. There is insufficient evidence to address whether or not there is a difference in the efficacy of NaF versus APF gels (IV).

CARIES RISK CATEGORIES

The panel encourages dentists to employ caries risk assessment strategies in their practices. Appropriate preventive dental treatment (including topical fluoride therapy) can be planned after identification of caries risk status. It also is important to consider that risk of developing dental caries exists on a continuum and changes over time as risk factors change. Therefore, caries risk status should be re-evaluated periodically.

The panel understands that there is no single system for caries risk assessment that has been shown to be valid and reliable. However, there is evidence that dentists can use simple clinical indicators to classify caries risk status that is predictive of future caries experience. The panel offers the system outlined below, which is modified from systems that were tested in a clinical setting to classify patients with either low, moderate or high caries risk. This system is offered for guidance and, as stated above, must be balanced with the practitioner's professional expertise. Other resources for assessing caries risk exist and are referenced in the full document.

Low caries risk

All age groups
No incipient or cavitated primary or secondary carious lesions during the last three years and no factors that may increase caries risk*

Moderate caries risk

Younger than 6 years
No incipient or cavitated primary or secondary carious lesions during the last three years but presence of at least one factor that may increase caries risk*

Older than 6 years (any of the following)
One or two incipient or cavitated primary or secondary carious lesions in the last three years
No incipient or cavitated primary or secondary carious lesions in the last three years but presence of at least one factor that may increase caries risk*

High caries risk

Younger than 6 years (any of the following)
Any incipient or cavitated primary or secondary carious lesion during the last three years
Presence of multiple factors that may increase caries risk*
Low socioeconomic status†
Suboptimal fluoride exposure
Xerostomia‡

Older than 6 years (any of the following)
Three or more incipient or cavitated primary or secondary carious lesions in the last three years
Presence of multiple factors that may increase caries risk*
Suboptimal fluoride exposure
Xerostomia‡

*Factors increasing risk of developing caries also may include, but are not limited to
- high titers of cariogenic bacteria;
- poor oral hygiene;
- prolonged nursing (bottle or breast);
- poor family dental health;
- developmental or acquired enamel defects;
- genetic abnormality of teeth;
- many multisurface restorations;
- chemotherapy or radiation therapy;
- eating disorders;
- drug or alcohol abuse;
- irregular dental care;
- cariogenic diet;
- active orthodontic treatment;
- presence of exposed root surfaces;
- restoration overhangs and open margins;
- physical or mental disability with inability or unavailability of performing proper oral health care.

† On the basis of findings from population studies, groups with low socioeconomic status have been found to have an increased risk of developing caries. In children too young for their risk to be based on caries history, low socioeconomic status should be considered as a caries risk factor.

‡ Medication-, radiation- or disease-induced xerostomia.

When reviewing the systematic reviews and clinical trials, the panel considered the caries risk status of the individuals who participated in the studies.

EVIDENCE-BASED CLINICAL RECOMMENDATIONS FOR PROFESSIONALLY APPLIED TOPICAL FLUORIDE

The following table summarizes the evidence-based clinical recommendations for the use of professionally applied topical fluoride. The clinical recommendations are a resource for dentists to use. These clinical recommendations must be balanced with the practitioner's professional judgment and the individual patient's preferences.

It is recommended that all age and risk groups use an appropriate amount of fluoride toothpaste when brushing twice a day, and that the amount of toothpaste used for children under 6 years of age not exceed the size of a pea. For patients at moderate and high risk of caries, additional preventative interventions should be considered, including use of additional fluoride products at home, pit-and-fissure sealants and antibacterial therapy.

RISK CATEGORY	AGE CATEGORY FOR RECALL PATIENTS								
	< 6 Years			6 To 18 Years			18 + Years		
	Recommendation	Grade of Evidence	Strength of Recommendation	Recommendation	Grade of Evidence	Strength of Recommendation	Recommendation	Grade of Evidence	Strength of Recommendation
Low	May not receive additional benefit from professional topical fluoride application*	Ia	B	May not receive additional benefit from professional topical fluoride application*	Ia	B	May not receive additional benefit from professional topical fluoride application*	IV	D
Moderate	Varnish application at 6-month intervals	Ia	A	Varnish application at 6-month intervals OR Fluoride gel application at 6-month intervals	Ia Ia	A A	Varnish application at 6-month intervals OR Fluoride gel application at 6-month intervals	IV IV	D§ D‡
High	Varnish application at 6-month intervals OR Varnish application at 3-month intervals	Ia Ia	A D†	Varnish application at 6-month intervals OR Varnish application at 3-month intervals OR Fluoride gel application at 6-month intervals OR Fluoride gel application at 3-month intervals	Ia Ia Ia IV	A A† A D‡	Varnish application at 6-month intervals OR Varnish application at 3-month intervals OR Fluoride gel application at 6-month intervals OR Fluoride gel application at 3-month intervals	IV IV IV IV	D§ D§ D‡ D‡

* Fluoridated water and fluoride toothpastes may provide adequate caries prevention in this risk category. Whether or not to apply topical fluoride in such cases is a decision that should balance this consideration with the practitioner's professional judgment and the individual patient's preferences.

† Emerging evidence indicates that applications more frequent than twice per year may be more effective in preventing caries.

‡ Although there are no clinical trials, there is reason to believe that fluoride gels would work similarly in this age group.

§ Although there are no clinical trials, there is reason to believe that fluoride varnish would work similarly in this age group.

Laboratory data demonstrate foam's equivalence to gels in terms of fluoride release; however, only two clinical trials have been published evaluating its effectiveness. Because of this, the recommendations for use of fluoride varnish and gel have not been extrapolated to foams.

Because there is insufficient evidence to address whether or not there is a difference in the efficacy of NaF versus APF gels, the clinical recommendations do not specify between these two formulations of fluoride gels. Application time for fluoride gel and foam should be 4 minutes. A 1-minute fluoride application is not endorsed.

ACKNOWLEDGMENTS

American Dental Association
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The complete document, "Professionally Applied Topical Fluoride: Evidence-Based Clinical Recommendations," is available online at "www.ada.org/goto/ebd" or by calling the ADA's toll-free number, Ext. 2878.

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Effectiveness of Preventive Dental Treatments by Physicians for Young Medicaid Enrollees

Bhavna T. Pahel, R. Gary Rozier, Sally C. Stearns and Rocio B. Quiñonez

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DOI: 10.1542/peds.2010-1457

Effectiveness of Preventive Dental Treatments by Physicians for Young Medicaid Enrollees

WHAT'S KNOWN ON THIS SUBJECT: Mixed evidence exists regarding the effectiveness of preventive dental services in medical settings. Physicians and nurses are willing to provide preventive dental services, parents are satisfied with the services their children receive, and programs that encourage physician participation increase access.

WHAT THIS STUDY ADDS: Despite declines in effectiveness since fluoride treatment and referrals to dentists to treat existing disease, this study reports that oral health services by non-dental health care providers for Medicaid preschool-aged children lead to reductions in caries-related treatments.

abstract

OBJECTIVE: To estimate the effectiveness of a medical office–based preventive dental program (Into the Mouths of Babes [IMB]), which included fluoride varnish application, in reducing treatments related to dental caries.

METHODS: We used longitudinal claims and enrollment data for all children aged 72 months or younger enrolled in North Carolina Medicaid from 2000 through 2006. Regression analyses compared subgroups of children who received up to 6 IMB visits at ages 6 to 35 months with children who received no IMB visits. Analyses were adjusted for child and area characteristics.

RESULTS: Children enrolled in North Carolina Medicaid with ≥4 IMB visits experienced, on average, a 17% reduction in dental-caries–related treatments up to 6 years of age compared with children with no IMB visits.When we simulated data for initial IMB visits at 12 and 15 months of age, there was a cumulative 49% reduction in caries-related treatments at 17 months of age. The cumulative effectiveness declined because of an increase in treatments from 24 to 36 months, an increase in referrals for dental caries occurred with increasing time since fluoride application, and emergence of teeth not initially treated with fluoride.

CONCLUSIONS: North Carolina's IMB program was effective in reducing caries-related treatments for children with ≥4 IMB visits. Multiple applications of fluoride at the time of primary tooth emergence seem to be most beneficial. Referrals to dentists for treatment of existing disease detected by physicians during IMB implementation limited the cumulative reductions in caries-related treatments, but also contributed to improved oral health. *Pediatrics* 2011;127:e682–e689

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KEY WORDS

dental caries, Medicaid, fluoride varnish, dental treatment, preschool children, physicians

ABBREVIATIONS

ECC—early childhood caries
IMB—Into the Mouths of Babes

The content of this article is solely the responsibility of the authors and does not necessarily represent the official views of the National Institute of Dental and Craniofacial Research or the National Institutes of Health.

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ARTICLE

COMPARATIVE EFFECTIVENESS RESEARCH

Cost-effectiveness of Preventive Oral Health Care in Medical Offices for Young Medicaid Enrollees

Sally C. Stearns, PhD; R. Gary Rozier, DDS, MPH; Ashley M. Kranz, BA; Bhavna T. Pahel, BDS, MPH, PhD; Rocio B. Quiñonez, DMD, MS, MPH

Objective: To estimate the cost-effectiveness of a medical office–based preventive oral health program in North Carolina called Into the Mouths of Babes (IMB).

Design: Observational study using Medicaid claims data (2000-2006).

Setting: Medical staff delivered IMB services in medical offices, and dentists provided dental services in offices or hospitals.

Participants: A total of 209 285 children enrolled in Medicaid at age 6 months.

Interventions: Into the Mouths of Babes visits included screening, parental counseling, topical fluoride application, and referral to dentists, if needed. The cost-effectiveness analysis used the Medicaid program perspective and a propensity score–matched sample with regression analysis to compare children with 4 or more vs 0 IMB visits.

Main Outcome Measures: Dental treatments and Medicaid payments for children up to age 6 years enabled assessment of the likelihood of whether IMB was cost-saving and, if not, the additional payments per hospital episode avoided.

Results: Into the Mouths of Babes is 32% likely to be cost-saving, with discounting of benefits and payments. On average, IMB visits cost $11 more than reduced dental treatment payments per person. The program almost breaks even if future benefits from prevention are not discounted, and it would be cost-saving with certainty if IMB services could be provided at $34 instead of $55 per visit. The program is cost-effective with 95% certainty if Medicaid is willing to pay $2331 per hospital episode avoided.

Conclusions: Into the Mouths of Babes improves dental health for additional payments that can be weighed against unmeasured hospitalization costs.

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doi:10.1001/archpediatrics.2012.797

VARIOUS STUDIES HAVE documented high and increasing rates of dental caries among children younger than 5 years of age[1,2] as well as related negative health consequences.[3,4] Most children with dental caries are in low-income families and use dental care infrequently, despite eligibility for services through public insurance.[2] The limited dentist supply and dentists' low rate of participation in Medicaid further preclude access, motivating many communities to examine alternate approaches to this pressing public health problem.[5]

For editorial comment see page 965

The pediatric primary care setting provides an alternative site to deliver preventive oral health interventions for preschool-aged children before they develop poor oral health.[6,7] Although very young children are unlikely to visit dentist offices, they frequently make well-child visits to primary care physicians.[8] Preventive oral health care programs in medical offices include screening and risk assessment, parental counseling, topical fluoride application, and referral to dentists for further assessment or treatment, if needed.[7] Topical fluoride varnish is viewed as a cost-effective component of oral health care for low-income children, with recommendations for use every 3 to 6 months in high-risk children younger than 6 years of age.[9-11] Studies have shown that intervention in preschool-aged children with fluoride varnish improves dental health and defrays costs but is not cost-saving.[12,13]

Evidence of the effectiveness of oral health care in medical settings is limited.[14] A program called Into the Mouths of Babes (IMB) was initiated in North Carolina (NC) in 2000 in which physicians are reimbursed by Medicaid to conduct dental screenings of children 3 years of age or younger, apply fluoride varnish, and counsel parents. Into the Mouths of Babes im-

Author Affiliations: Department of Health Policy and Management (Drs Stearns and Rozier, and Ms Kranz), School of Dentistry (Dr Pahel), and Departments of Pediatric Dentistry and Pediatrics (Dr Quiñonez), The University of North Carolina at Chapel Hill.

Guideline on Infant Oral Health Care

Originating Committee
Clinical Affairs Committee – Infant Oral Health Subcommittee

Review Council
Council on Clinical Affairs

Adopted
1986

Revised
1989, 1994, 2001, 2004, 2009, 2011, 2012

Purpose
The American Academy of Pediatric Dentistry (**AAPD**) recognizes that infant oral health is one of the foundations upon which preventive education and dental care must be built to enhance the opportunity for a lifetime free from preventable oral disease. The AAPD proposes recommendations for preventive strategies, oral health risk assessment, anticipatory guidance, and therapeutic interventions to be followed by dental, medical, nursing, and allied health professional programs.

Methods
This guideline is an update of the previous Guideline on Infant Oral Health Care, revised in 2009. This revision included a hand search of literature as well as a new search of the MEDLINE/PubMed® electronic database using the following parameters: Terms: "infant oral health", "infant oral health care", and "early childhood caries"; Fields: all; Limits: within the last 10 years, humans, English, and clinical trials. Papers for review were chosen from the resultant list of 449 articles and from references within selected articles. When data did not appear sufficient or were inconclusive, recommendations were based upon expert and/or consensus opinion by experienced researchers and clinicians.

Background
The Centers for Disease Control and Prevention reports that caries is the most prevalent infectious disease in our nation's children.[1] More than 40 percent of children have caries by the time they reach kindergarten.[2] In contrast to declining prevalence of dental caries among children in older age groups, the prevalence of caries in poor US children under the age of five is increasing.[3] Early childhood caries (**ECC**) and the more severe form of ECC (**S-ECC**) can be particularly virulent forms of caries, beginning soon after tooth eruption, developing on smooth surfaces, progressing rapidly, and having a lasting detrimental impact onthe dentition.[4-9] This disease affects the general population but is 32 times more likely to occur in infants who are of low socioeconomic status, who consume a diet high in sugar, and whose mothers have a low education level.[10,11] Caries in primary teeth can affect children's growth, result in significant pain and potentially life-threatening infection, and diminish overall quality of life.[12-21] Since medical health care professionals are far more likely to see new mothers and infants than are dentists, it is essential that they be aware of the infectious etiology and associated risk factors of ECC, make appropriate decisions regarding timely and effective intervention, and facilitate the establishment of the dental home.[4,22-25]

Dental caries
Dental caries is a common chronic infectious transmissible disease resulting from tooth-adherent specific bacteria, primarily mutans streptococci (**MS**), that metabolize sugars to produce acid which, over time, demineralizes tooth structure.[26] MS generally is considered to be the principal group of bacterial organisms responsible for the initiation of dental caries.[27] MS colonization of an infant may occur from the time of birth.[28-34] Significant colonization occurs after dental eruption as teeth provide non-shedding surfaces for adherence. Other surfaces also may harbor MS.[32,35,36] For example, the furrows of the tongue appear to be an important ecological niche in harboring the bacteria in predentate infants.[33,35]

Vertical transmission of MS from mother to infant is well documented.[37-39] Genotypes of MS in infants appear identical to those present in mothers in 17 reports, ranging from 24 to 100 percent.[39] The higher the levels of maternal salivary MS, the greater the risk of the infant being colonized.[40,41] Along with salivary levels of MS, mother's oral hygiene, periodontal disease, snack frequency, and socioeconomic status also are associated with infant colonization.[36] Reports indicate that horizontal transmission (ie, transmission between members of a group such as siblings of a similar age or children in a daycare center) also may be of concern.[42-45] Dental caries is a disease that generally is preventable. Early risk assessment allows for identification of parent-infant groups who are at risk for ECC and would benefit from early preventive intervention. The ultimate goal of early assessment is the timely delivery of educational information to populations at high risk for developing caries in order to prevent the need for later surgical intervention.

Anticipatory guidance

Caries-risk assessment for infants allows for the institution of appropriate strategies as the primary dentition begins to erupt. Even the most judiciously designed and implemented caries-risk assessment, however, can fail to identify all infants at risk for developing ECC. In these cases, the mother may not be the colonization source of the infant's oral flora, the dietary intake of simple carbohydrates may be extremely high, or other uncontrollable factors may combine to place the infant at risk for developing dental caries. Therefore, screening for risk of caries in the parent and infant, coupled with oral health counseling, is not a substitute for the early establishment of the dental home.[41] The early establishment of a dental home, including ECC prevention and management, is the ideal approach to infant oral health care.[25,37] The inclusion of education regarding the infectious and transmissible nature of bacteria that cause ECC, as well as methods of oral health risk assessment, anticipatory guidance, and early intervention, into the curriculum of medical, nursing, and allied health professional programs has shown to be effective in increasing the establishment of a dental home.[47,48] Recent studies, noting that a majority of pediatricians and general dentists were not advising patients to see a dentist by one year of age, point to the need for increased infant oral health care education in the medical and dental communities.[49,50]

Recommendations

Recommendations for parental oral health[51]

Oral health education: All primary health care professionals who serve parents and infants should provide education on the etiology and prevention of ECC. Educating the parent on avoiding saliva-sharing behaviors (eg, sharing spoons and other utensils, sharing cups, cleaning a dropped pacifier or toy with their mouth) can help prevent early colonization of MS in infants.

Comprehensive oral examination: Referral for a comprehensive oral examination and treatment during pregnancy is especially important for the mother.

Professional oral health care: Routine professional dental care for the parent can help optimize oral health. Removal of active caries, with subsequent restoration of remaining tooth structure, in the parents suppresses the MS reservoir and minimizes the transfer of MS to the infant, thereby decreasing the infant's risk of developing ECC.[52]

Oral hygiene: Brushing with fluoridated toothpaste and flossing by the parent are important to help dislodge food and reduce bacterial plaque levels.

Diet: Dietary education for the parents includes the cariogenicity of certain foods and beverages, role of frequency of consumption of these substances, and the demineralization/remineralization process.

Fluoride: Using a fluoridated toothpaste and rinsing with an alcohol-free, over-the-counter mouth rinse containing 0.05 percent sodium fluoride once a day or 0.02 percent sodium fluoride rinse twice a day have been suggested to help reduce plaque levels and promote enamel remineralization.[22]

Xylitol chewing gum: Evidence suggests that the use of xylitol chewing gum (at least two to three times a day by the mother) has a significant impact on mother-child transmission of MS and decreasing the child's caries rate.[53-55]

Recommendations for the infant's oral health

Oral health risk assessment: Every infant should receive an oral health risk assessment from his/her primary health care provider or qualified health care professional by six months of age. This initial assessment should evaluate the patient's risk of developing oral diseases of soft and hard tissues, including caries-risk assessment, provide education on infant oral health, and evaluate and optimize fluoride exposure.

Establishment of a dental home: Parents should establish a dental home for infants by 12 months of age.[56] The initial visit should include thorough medical (infant) and dental (parent and infant) histories, a thorough oral examination, performance of an age-appropriate tooth brushing demonstration, and prophylaxis and fluoride varnish treatment if indicated. In addition, assessing the infant's risk of developing caries and determining a prevention plan and interval for periodic re-evaluation should be done. Infants should be referred to the appropriate health professional if specialized intervention is necessary. Providing anticipatory guidance regarding dental and oral development, fluoride status, non-nutritive sucking habits, teething, injury prevention, oral hygiene instruction, and the effects of diet on the dentition are also important components of the initial visit.

Teething: Teething can lead to intermittent localized discomfort in the area of erupting primary teeth, irritability, and excessive salivation; however, many children have no apparent difficulties. Treatment of symptoms includes oral analgesics and chilled rings for the child to "gum".[57] Use of topical anesthetics, including over-the-counter teething gels, to relieve discomfort are discouraged due to potential toxicity of these products in infants.[58-60]

Oral hygiene: Oral hygiene measures should be implemented no later than the time of eruption of the first primary tooth. Cleansing the infant's teeth as soon as they erupt with a soft toothbrush will help reduce bacterial colonization. Toothbrushing should be performed for children by a parent twice daily, using a soft toothbrush of age-appropriate size. Flossing should be initiated when adjacent tooth surfaces can not be cleansed with a toothbrush.[40]

Diet: Epidemiological research shows that human milk and breast-feeding of infants provide general health, nutritional, developmental, psychological, social, economic, and environmental advantages while significantly decreasing risk for a large number of acute and chronic diseases.[61] Human breast milk is uniquely superior in providing the best possible nutrition to infants and has not been epidemiologically associated with caries.[62-64] Frequent night time bottle feeding with milk is associated with, but not consistently implicated in, ECC.[63] Breastfeeding greater than seven times daily after 12 months of age is associated with increased risk for ECC.[66] Night time bottle feeding with juice, repeated use of a sippy or no-spill cup, and frequent in between meal consumption of sugar-containing

snacks or drinks (eg, juice, formula, soda) increase the risk of caries.[67-68] High-sugar dietary practices appear to be established early, by 12 months of age, and are maintained throughout early childhood.[69,70] The American Academy of Pediatrics has recommended children one through six years of age consume no more than four to six ounces of fruit juice per day, from a cup (ie, not a bottle or covered cup) and as part of a meal or snack.[71]

Fluoride: Optimal exposure to fluoride is important to all dentate infants and children.[72] Decisions concerning the administration of fluoride are based on the unique needs of each patient.[73-75] The use of fluoride for the prevention and control of caries is documented to be both safe and effective.[76-80] When determining the risk-benefit of fluoride, the key issue is mild fluorosis versus preventing devastating dental disease. In children considered at moderate or high caries risk under the age of two, a 'smear' of fluoridated toothpaste should be used. In all children ages two to five, a 'pea-size' amount should be used.[81-83] Professionally-applied topical fluoride, such as fluoride varnish, should be considered for children at risk for caries.[76,79,80,84,85] Systemically-administered fluoride should be considered for all children at caries risk who drink fluoride deficient water (less than 0.6 ppm) after determining all other dietary sources of fluoride exposure.[86] Careful monitoring of fluoride is indicated in the use of fluoride-containing products. Fluor-osis has been associated with cumulative fluoride intake during enamel development.

Injury prevention: Practitioners should provide age-appropriate injury prevention counseling for orofacial trauma. Initially, discussions would include play objects, pacifiers, car seats, and electric cords.[56]

Non-nutritive habits: Non-nutritive oral habits (eg, digit or paci-fier sucking, bruxism, abnormal tongue thrust) may apply forces to teeth and dentoalveolar structures. It is important to discuss the need for early sucking and the need to wean infants from these habits before malocclusion or skeletal dysplasias occur.[56]

Additional recommendations

Health care professionals and all other stakeholders in children's oral health should support the identification of a dental home for all infants by 12 months of age. Legislators, policy makers, and third party payors should be educated regarding the importance of early interventions to prevent ECC.

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Promoting Oral Health

Theme 7

Introduction

Oral health is critically important to the overall health and well-being of children and adolescents. It covers a range of health promotion and disease prevention concerns, including dental caries (tooth decay); periodontal health; proper development and alignment of facial bones, jaws, and teeth; oral diseases and conditions; and trauma or injury to the mouth and teeth. Oral health is an important and continuing health supervision issue for the health care professional.

Childhood caries (tooth decay) is a preventable and transmissible infectious disease, caused by bacteria (eg, *Streptococcus mutans or Streptococcus sobrinus*) that form plaque on the surface of teeth. The bacteria interact with sugar in foods and beverages, turning it into acids that dissolve tooth enamel, causing caries.

Caries is the most common chronic disease in children—5 times more common than asthma.[1] Left untreated, pain and infection caused by tooth decay can lead to problems in eating, speaking, and learning.[1] Forty percent of children have caries by the time they reach kindergarten,[2] and many school hours are lost each year due to dental problems related to caries.[1-3]

Several population groups are particularly vulnerable to caries. For example, children and youth with special health care needs are at increased risk. National surveys also have demonstrated that children in low-income and moderate-income households are more likely to have caries and more decayed or filled teeth than children who are from more affluent households. Even within income levels, children of color are more likely to have caries than white children.[4] Thus, sociodemographic status should be viewed as an initial indicator of risk that can be offset by the absence of other risk indicators.

Health care professionals can teach children, adolescents, and their families about oral hygiene, healthy diet and feeding practices, optimal exposure to fluoride, and timely referral to a dentist. Health care professionals also often make the initial response for oral trauma. They should keep in mind that the differential diagnosis for oral trauma includes intentional injury.[5]

Bright Futures in Practice: Oral Health Pocket Guide (2004) provides a structured and comprehensive approach to this anticipatory guidance for the health care professional.[6] The Health Resources and Services Administration's (HRSA's) National Maternal and Child Oral Health Resource Center (www.mchoralhealth.org) also provides many valuable tools and resources for health care professionals.[7] Additional information is available at the American Academy of Pediatrics (AAP) Web site (www.aap.org).

The Importance of a Dental Home

The dental home is the "ongoing relationship between the dentist and the patient, inclusive of all aspects of oral health delivered in a comprehensive, continuously accessible coordinated and family-centered way."[8]

Box 1 describes the services that should be provided within a dental home.

The dental community (the American Dental Association, the Academy of General Dentistry, and the American Academy of Pediatric Dentistry [AAPD]) is united in encouraging families to establish a dental home by the time their child is 1 year old.[9] Having a dental home is the ideal deterrence to the development of caries, from infancy through adolescence. Early preventive dental

The dental community (the American Dental Association, the Academy of General Dentistry, and the American Academy of Pediatric Dentistry) is united in encouraging families to establish a dental home by the time their child is 1 year old.

BOX 1
Dental Home

According to the American Academy of Pediatric Dentistry (AAPD), the dental home should provide the following:

- Comprehensive oral health care, including acute care and preventive services, in accordance with AAPD periodicity schedules.
- Comprehensive assessment for oral diseases and conditions.
- An individualized preventive dental health program based on a caries risk assessment and a periodontal disease risk assessment.
- Anticipatory guidance about growth and development issues (ie, teething, thumb or finger or pacifier habits).
- A plan for acute dental trauma.
- Information about proper care of the child's teeth and gingivae. This would include prevention, diagnosis, and treatment of disease of the supporting and surrounding tissues and the maintenance of health, function, and esthetics of those structures and tissues.
- Dietary counseling.
- Referrals to specialists when care cannot directly be provided within the dental home.
- Education regarding future referral to a dentist knowledgeable and comfortable with adult oral health issues for continuing oral health care; referral at an age determined by patient, parent, and pediatric dentist.

Adopted from: American Academy of Pediatric Dentistry. *Policy on the Dental Home*. American Academy of Pediatric Dentistry; revised 2004.[9]

visits have been shown to reduce dental disease and reduce costs. For example, Savage et al[10] showed that dental costs for Medicaid-eligible children who began dental visits between the ages of 1 and 2 years were approximately 60% of the cost for children who began dental visits between the ages of 4 and 5 years.

As children and adolescents mature into adulthood, a dental home also can ensure that they receive oral health education/counseling, preventive and early intervention measures, and treatment, including treatment for periodontal care, orthodontic services, trauma, and other conditions.

Efforts to establish a dental home offer an opportunity for partnerships and foster a connection with the community. A partnership among health care professionals in primary care, dental health, public health, child care, and school settings can help ensure access to a dental home for each child during the early childhood, middle childhood, and adolescent years. (For more information on this topic, see the Promoting Community Relationships and Resources theme.)

Supplemental Fluoride

Fluoride plays a key role in preventing and controlling caries. Fluoride helps reduce loss of minerals from tooth enamel (demineralization) and promotes replacement of minerals (remineralization) in dental enamel that has been damaged by acids produced by bacteria in plaque. Regular and frequent exposure to small amounts of fluoride is the best way to protect the teeth against caries. This exposure can be readily accomplished through drinking water that has been optimally fluoridated and brushing with fluoride toothpaste twice daily.[11]

Fluoride supplementation typically is not needed in the first 6 months of life. Beginning at the age of 6 months, children should drink fluoridated community drinking water or take prescribed supplements (ie, drops or chewable tablets).[11-13] As an alternative to fluoride supplements, parents can purchase bottled water that contains fluoride.

Additional types of fluoride may be used as a primary preventive measure and, generally, are recommended for infants, children, and adolescents who are deemed to be at high risk of caries. Research has shown that the primary caries prevention effects of fluoride result from its topical contact with enamel and through its antibacterial actions. Therefore, topical agents (eg, concentrated fluoride gels, foams, and varnishes) may be used as a strategy for children who are deemed to be at elevated risk of tooth decay.[11,14]

Even if indicated, additional fluoride should be used judiciously in children 6 years and younger to minimize the risk of fluorosis (ie, overexposure to fluoride).[11] Fluorosis can come from using too much toothpaste that contains fluoride, drinking water with higher than recommended fluoride levels, and taking fluoride supplements when other sources of fluoride are available.[15] To prevent fluorosis, the primary water source(s) must be tested before parents are advised to supplement with fluoride.[16]

For adolescents, optimal fluoride levels in drinking water, combined with fluoride-containing preparations, such as toothpastes, gels, varnishes, and rinses, have significantly reduced dental decay, but caries risk remains high during this age period.[17,18] Adolescents at high risk of caries should be evaluated for topical fluoride beyond that provided by water supply and a fluoridated toothpaste.

Fluoride helps reduce loss of minerals from tooth enamel (demineralization) and promotes replacement of minerals (remineralization) in dental enamel that has been damaged by acids produced by bacteria in plaque.

Children and Youth With Special Health Care Needs

Children with special health care needs (eg, infants at risk of enamel demineralization and hypoplasia because of poor mineralization or osteopenia, nutritional deficiencies, or medication usage) present a unique set of concerns for oral health because they are

particularly prone to the development of caries. Because dental care for these children is often difficult and sometimes risky, the health care professional should refer the child to a dentist as early as possible for vigilant preventive dental care, which may alleviate the need for future surgical intervention.

Oral diseases also may have a direct and devastating impact on the general health of children with certain systemic or developmental problems or conditions. Children with compromised immunity or certain cardiac, kidney, or liver conditions may be especially vulnerable to the effects of oral diseases. Children with cognitive disabilities or developmental or neuromuscular conditions who do not have the ability to understand and assume responsibility for, or cooperate with, preventive oral health practices may be at higher risk for complications or systemic infections from oral diseases.[19]

The child with special needs should begin dental care in the first year and visit the dentist every 6 months or more frequently as needed.

Children and youth with special health care needs may require more help with their oral self-care routines (ie, brushing and flossing) than other children. Health care professionals should advise parents or caregivers to supervise and intervene as needed to help their children with brushing and flossing if their special needs prevent them from doing a thorough job. The child with special needs should begin dental care in the first year and visit the dentist every 6 months or more frequently as needed.

Adolescents with special health care needs may face difficulties because of their physical condition, malformations, medicines, or nutrition. They should receive regular dental care and be encouraged to take as much responsibility as possible for their own oral hygiene.

Promoting Oral Health: Infancy—Birth to 11 Months

Even though a child's teeth do not begin to appear until the middle of this developmental period, oral health is still a concern because of the potential that caries can develop during the first year of life.

Oral Hygiene and Feeding Practices That Promote Oral Health

Even before the baby's birth, parents and other caregivers should make sure their own mouths are as healthy as possible to reduce transmission of caries-causing harmful bacteria from their saliva to the newborn baby's mouth. Health care professionals should educate family members or caregivers in the following ways to prevent transmission of these bacteria from themselves to the infant:

- Practice good oral hygiene and seek dental care.
- Do not share utensils, cups, spoons, or toothbrushes with the infant.
- Do not clean a pacifier in their own mouths before giving it to the infant.
- Consult with an oral health professional about the use of xylitol gum (if the adult's oral health is a concern). This gum can have a positive impact on oral health by decreasing the bacterial load in an adult's mouth.[20]

The primary teeth begin to erupt at different ages during the first year of life. An infant is susceptible to tooth decay as soon as her first teeth erupt if she has a sufficient bacterial load already present in her mouth and prolonged exposure to carbohydrates. Chalky white areas on the teeth are the first sign of dental decay. Both inadequate oral hygiene and inappropriate feeding practices that expose teeth to natural or refined sugars for prolonged periods contribute to the development of early childhood caries. Health care professionals should educate parents in the

following ways to keep teeth clean and remove plaque:

- Minimize exposure to natural or refined sugars in the infant's mouth.
  - Avoid frequent exposure to foods that can lead to early childhood caries.
  - Hold the infant while feeding. Never prop a bottle (ie, use pillows or any other object to hold a bottle in the infant's mouth).
  - Do not allow the infant to fall asleep with a bottle that contains milk, formula, juice, or other sweetened liquid.
  - Avoid dipping pacifiers in any sweetened liquid, sugars, or syrups.[16]
- Use a toothbrush twice daily as soon as teeth erupt. In children younger than 2 years, the teeth should be brushed with plain water twice a day (after breakfast and before bed),[6] unless advised by a dentist to use fluoridated toothpaste based on a child's elevated dental caries risk.

To help prevent early childhood caries, parents also should take advantage of this developmental stage to establish lifelong nutritious eating patterns for the family that emphasize consumption of fruits, vegetables, whole grains, lean meats, and dairy products, and that minimize consumptions of foods and liquids high in sugars. (For more information on this topic, see the Promoting Healthy Nutrition theme.)

Oral Health Risk Assessment

In 2003, the AAP developed a policy statement, Oral Health Risk Assessment Timing and Establishment of the Dental Home, that recommended that primary care child health care professionals conduct an oral health risk assessment when a child is 6 months of age (Box 2).[21] This assessment consists of asking parents about their, and the child's, oral hygiene and looking at the child's mouth to assess the risk of caries.

The AAP recognizes that, even today, some children live in communities that lack pediatric dentists or general dentists who are able to see infants and young children. Therefore, primary care child health care professionals who care for these children may have to continue to perform periodic oral health risk assessments even after the first 6 to 12 months of age. These assessments allow health care professionals to identify children at the highest risk of oral health problems so that they can be referred to whatever limited resources are available. Some child health care professionals also may provide enhanced oral health counseling or apply fluoride varnish to help with caries prevention in

BOX 2
Pediatric Oral Health Risk Assessment

Adopted from the AAP policy statement that states that all children should undergo an oral health risk assessment beginning at 6 months of age by a qualified pediatric health care professional:

"If an infant is assessed to be in one of the following risk groups, the care requirements could be significant and surgically invasive. Therefore, these infants should be referred to a dentist as early as 6 months of age and no later than 6 months after the first tooth erupts or 12 months of age (whichever comes first) for establishment of a dental home:

- Children with special health care needs
- Children of mothers with a high caries rates
- Children with demonstrable caries, plaque, demineralization, and/or staining
- Children who sleep with a bottle or breastfeed throughout the night
- Children in families of low socioeconomic status"

In 2003, the American Academy of Pediatrics… recommended that primary care child health care professionals conduct an oral health risk assessment when a child is 6 months of age.

high-risk children.[22,23] In addition, public health professionals often assist health care professionals and families to link to a dental home.

Promoting Oral Health: Early Childhood—1 to 4 Years

The key oral health priorities of this developmental stage are the same as those of infancy, namely preventing caries and developing healthy oral hygiene habits. Early childhood also is a good time for parents, caregivers, and health care professionals to build positive dietary habits as they introduce new foods and the child establishes taste preferences. Parents may have questions during this period about pacifiers and thumb-sucking and finger-sucking behaviors that are related to teeth and jaw alignment.

Oral Hygiene, Fluoride, and Feeding Practices That Promote Oral Health

Parents and caregivers can do much to prevent the development of caries and promote overall oral health during this period. As noted earlier, caries is an infectious disease, and parents should make sure their oral hygiene and diet meet the standards outlined here. Health care professionals should educate the family and caregivers in the following ways to reduce transmission of bacteria from themselves to the child:

- Practice good oral hygiene and seek dental care.
- Do not share utensils, cups, spoons, or toothbrushes with the child.
- Do not put the child's pacifiers in their own mouths. Clean pacifiers with mild soap and water.
- Consult with their oral health care professional about the use of gum containing xylitol (if the adult's oral health is a concern).

Health care professionals also should educate parents about ways to keep their child's teeth clean and ensure sufficient fluoride intake.

- Brush the child's teeth twice daily as soon as teeth erupt. Because young children do not have the manual dexterity to properly clean their own teeth, an adult usually must brush the teeth of preschool-aged children. When parents feel their child is doing a thorough job, they should allow the child more independence and freedom.
  - For children younger than 2 years, brush the teeth with plain water twice a day (after breakfast and before bed) unless advised by a dentist to use fluoridated toothpaste based on a child's elevated dental caries risk.
  - For children 2 years and older, brush the teeth with no more than a pea-sized amount (small smear) of fluoride toothpaste twice a day (after breakfast and before bed). The child should spit out the toothpaste after brushing, but not rinse his mouth with water. The small amount of toothpaste that remains in his mouth helps prevent tooth decay.[6] Children can be taught to floss if recommended by the dental professional.
- Make sure the child drinks fluoridated water or takes prescribed fluoride supplements.

Early childhood is a time in which children are exposed to new tastes, textures, and eating experiences. It is an important opportunity for parents and caregivers to firmly establish healthful eating patterns for the child and her family. These patterns should emphasize consumption of fruits, vegetables, whole grains, lean meats, and dairy products, and minimize consumptions of foods and liquids high in sugars. (For more information on this topic, see the Promoting Healthy Nutrition theme.)

Early childhood is a time in which children are exposed to new tastes, textures, and eating experiences. It is an important opportunity for parents and caregivers to firmly establish healthful eating patterns for the child and her family.

Oral Health Risk Assessment

The AAPD recommends that, after 12 months of age, a child should be seen by a dentist every 6 months or according to a schedule recommended by the dentist, based on the child's individual needs and susceptibility to disease.[24] The AAP notes that, in the absence of a dental home program that is able to see the 1- to 4-year-old child, the primary care child health care professional should continue to perform oral health risk assessments in the 1- to 4-year-old child.

The AAPD also recommends that health care professionals use the Caries-Risk Assessment Tool (CAT) beginning at age 1 year (Table 1) as part of the oral risk assessment.[25]

Other Oral Health Issues

The health care professional should be prepared to discuss the use of pacifiers and finger sucking or thumb sucking. Finger sucking often fills an emotional need, but it can lead to malocclusion, including anterior open bite (top teeth do not overlap the bottom teeth) and excess overjet (top teeth protrude relative to the bottom teeth). The intensity, duration, and nature of the sucking habit can be used to predict the amount of harm that can occur. Positive reinforcement, including a reward system or reminder system, is the most effective way to discourage finger sucking.

Promoting Oral Health: Middle Childhood—5 to 10 Years

During the early part of middle childhood, a child loses his first tooth and the first permanent teeth (maxillary and mandibular incisors and first molars) start to erupt. By the end of middle childhood, most of the permanent teeth have erupted. For the child, these are exciting signs of getting older. Middle childhood also is a good time for parents and caregivers to reinforce oral hygiene, optimal fluoride exposure, and positive diet habits they pursued in early childhood.

The history and physical examination performed by the health care professional should include oral health. The child also should see the dentist every 6 months or according to a schedule recommended by the dentist, based on the child's individual needs and susceptibility to disease. When the permanent molars erupt, the child's dentist should evaluate his teeth to determine the need for sealants that protect the teeth from caries.

The key oral health issues for this developmental stage are preventing caries and gingivitis, and ensuring proper development of the mouth and jaw. Reducing the risk of injury or trauma to the mouth and teeth and avoiding risk behaviors that negatively affect oral health also are important.

Oral Hygiene, Fluoride, and Nutrition Practices That Promote Oral Health

Health care professionals should educate parents in the following ways to help their child keep his teeth clean and remove plaque:

- Helping with, and supervising, the brushing of their child's teeth at least twice a day and flossing if recommended by the dental professional.
- Using only a pea-sized amount of fluoridated toothpaste to clean the child's teeth. The child should spit out the toothpaste after brushing, but not rinse his mouth with water. The small amount

The American Academy of Pediatric Dentistry recommends that, after 12 months of age, a child should be seen by a dentist every 6 months or according to a schedule recommended by the dentist, based on the child's individual needs and susceptibility to disease.

TABLE 1

American Academy of Pediatric Dentistry Caries-Risk Assessment Tool (CAT)

Risk Factors to Consider	**Risk Indicators**		
(For each item below, circle the most accurate response found to the right under "Risk Indicators")	High	Moderate	Low
Part 1 – History (determined by interviewing the parent/primary caregiver)			
Child has special health care needs, especially any that impact motor coordination or cooperation[A]	Yes		No
Child has condition that impairs saliva (dry mouth)[B]	Yes		No
Child's use of dental home (frequency of routine dental visits)	None	Irregular	Regular
Child has decay	Yes		No
Time lapsed since child's last cavity	<12 months	12 to 24 months	>24 months
Child wears braces or orthodontic/oral appliances[C]	Yes		No
Child's parent and/or sibling(s) have decay	Yes		No
Socioeconomic status of child's parents[D]	Low	Mid-level	High
Daily between-meal exposures to sugars/cavity producing foods (includes on demand use of bottle/sippy cup containing liquid other than water; consumption of juice, carbonated beverages, or sports drinks; use of sweetened medications)[E]	>3	1 to 2	Mealtime only
Child's exposure to fluoride[F,G]	Does not use fluoridated toothpaste; drinking water is not fluoridated and is not taking fluoride supplements	Uses fluoridated toothpaste; usually does not drink fluoridated water and does not take fluoride supplements	Uses fluoridated toothpaste; drinks fluoridated water or takes fluoride supplements
Times per day that child's teeth/gums are brushed	<1	1	2-3
Part 2 – Clinical evaluation (determined by examining the child's mouth)			
Visible plaque (white, sticky buildup)	Present		Absent
Gingivitis (red, puffy gums)[H]	Present		Absent
Areas of enamel demineralization (chalky white-spots on teeth)	More than 1	1	None
Enamel defects, deep pits/fissures[I]	Present		Absent
Part 3 – Supplemental professional assessment (Optional)[J]			
Radiographic enamel caries	Present		Absent
Levels of mutans streptococci or lactobacilli	High	Moderate	Low

Each child's overall assessed risk for developing decay is based on the highest level of risk indicator circled above (ie, single risk indicator in any area of the "high risk" category classifies a child as being "high risk").

A Children with special health care needs are those who have a physical, developmental, mental, sensory, behavioral, cognitive, or emotional impairment or limiting condition that requires medical management, health care intervention, and/or use of specialized services. The condition may be developmental or acquired and may cause limitations in performing daily self-maintenance activities or substantial limitations in a major life activity. Health care for special needs patients is beyond that considered routine and requires specialized knowledge, increased awareness and attention, and accommodation.

B Alteration in salivary flow can be the result of congenital or acquired conditions, surgery, radiation, medication, or age-related changes in salivary function. Any condition, treatment, or process known or reported to alter saliva flow should be considered an indication of risk unless proven otherwise.

C Orthodontic appliances include both fixed and removable appliances, space maintainers, and other devices that remain in the mouth continuously or for prolonged time intervals and which may trap food and plaque, prevent oral hygiene, compromise access of tooth surfaces to fluoride, or otherwise create an environment supporting caries initiation.

D National surveys have demonstrated that children in low-income and moderate-income households are more likely to have caries and more decayed or filled primary teeth than children from more affluent households. Also, within income levels, minority children are more likely to have caries. Thus, socioeconomic status should be viewed as an initial indicator of risk that may be offset by the absence of other risk indicators.

E Examples of sources of simple sugars include carbonated beverages, cookies, cake, candy, cereal, potato chips, French fries, corn chips, pretzels, breads, juices, and fruits. Clinicians using caries-risk assessment should investigate individual exposures to sugars known to be involved in caries initiation.

F Optimal systemic and topical fluoride exposure is based on use of a fluoride dentifrice and American Dental Association/American Academy of Pediatrics guidelines for exposure from fluoride drinking water and/or supplementation.

G Unsupervised use of toothpaste and at-home topical fluoride products are not recommended for children unable to expectorate predictably.

H Although microbial organisms responsible for gingivitis may be different than those primarily implicated in caries, the presence of gingivitis is an indicator of poor or infrequent oral hygiene practices and has been associated with caries progression.

I Tooth anatomy and hypoplastic defects (eg, poorly formed enamel, developmental pits) may predispose a child to develop caries.

J Advanced technologies such as radiographic assessment and microbiologic testing are not essential for using this tool.

of toothpaste that remains in his mouth helps prevent tooth decay.[6]

- Make sure the child drinks fluoridated water or takes prescribed fluoride supplements.

As children begin school and expand their horizons beyond the immediate circle of home and family, they are increasingly exposed to eating habits and foods that put them at increased risk of caries. Media, especially television, likely play a role in this increasing risk. Studies of the content of television programming show that advertisements directed at children are heavily weighted toward foods that are high in sugar, such as sweetened breakfast cereals, soft drinks, snacks, and candy.[26-28]

Parents continue to have the most influence on their children's eating behaviors and attitudes toward food. To the extent possible, parents should make sure that nutritious foods are available to their children, and they should continue to emphasize the healthful eating patterns and limitations of snacks that were established in infancy and early childhood. (For more information on this topic, see the Promoting Healthy Nutrition theme.)

Other Oral Health Issues

Finger or other sucking habits sometimes continue into middle childhood. These habits should be stopped when the permanent teeth begin to erupt. As the child begins to grow, the mouth grows, and the child should be evaluated by a dentist if malocclusion is seen.

Some children begin using tobacco during middle childhood. Therefore, the child should be encouraged not to smoke or use smokeless tobacco because it increases the risk of periodontal disease and oral cancer and poses substantial risks to overall health.

As children mature and begin to play with increased strength and vigor, both in free play

As children begin school and expand their horizons beyond the immediate circle of home and family, they are increasingly exposed to eating habits and foods that put them at increased risk of caries.

and organized sports, the risk of injury to the mouth increases. The child and parent or caregiver should know what to do in the event of an emergency, especially if a tooth is visibly broken (chipped or fractured), displaced (luxated), or knocked completely out of the socket (avulsed). In these cases, the patient should be referred to a dentist immediately. An avulsed permanent tooth needs to be reimplanted as quickly as possible, but an avulsed primary tooth should not be reimplanted, because it likely would cause damage to developing permanent teeth.

Mouth guards worn during sports and other athletics greatly reduce the severity of accidental trauma to individual teeth by distributing the forces of impact to all of the teeth and jaws. Custom adaptations range from softening a generic plastic mouth guard in boiling water and biting into it to register a custom bite, to fabricating a guard on a custom mold. Both types work well to prevent oral trauma and differ only in cost and comfort. The protection afforded by any type of guard mandates use in both organized and leisure-time sports activity.

Mouth guards worn during sports and other athletics greatly reduce the severity of accidental trauma to individual teeth by distributing the forces of impact to all of the teeth and jaws.

Promoting Oral Health: Adolescence—11 to 21 Years

Adolescence is characterized by the loss of the remaining primary teeth and complete eruption of all the permanent teeth, including the third molars or wisdom teeth in late adolescence. Growth spurts of the facial bones occur early and then taper off as adolescence progresses. The end result is a fully established bite.

Several oral health issues from earlier developmental stages continue to be important in adolescence. For example, vigilant oral hygiene and positive dietary habits can strengthen a sound foundation for adult oral health by preventing destructive periodontal disease and dental decay. Avoiding traumatic injury to the mouth is another continuing priority. Other issues are new. For example, adolescence brings increased susceptibility to irreversible periodontal or gum disease that may be related to hormonal and immunologic changes. A comprehensive oral hygiene regimen of brushing and flossing, combined with regular professional care, can manage this response.

Oral Hygiene, Fluoride, and Nutrition Practices That Promote Oral Health

The adolescent should be responsible for her own preventive oral health care and should have an established dental home. She should see the dentist every 6 months or according to a schedule recommended by the dentist, based on individual needs and susceptibility to disease. The dental professional also may consider diet analysis, topical fluoride applications, antimicrobial regimens, and dental sealants for high-risk patients or those with significant dental disease.

Although preventive therapy has resulted in increased numbers of adolescents with healthy teeth, caries is still common in teens and growing evidence suggests that a small percentage of adolescents account for the most severe caries.[4,17,18]

Adolescents' risk of caries may be increased by the following:

- Susceptible tooth surfaces as a result of immature enamel in newly erupted permanent teeth.
- Indifference to oral hygiene, which allows plaque to accumulate and mature.
- Frequent and unregulated exposure to high quantities of natural and refined sugars, a feature of many adolescent diets, which provides the perfect medium for caries to develop.[29,30]
- Eating disorders, such as bulimia, which can result in a characteristic erosion of the dental enamel by repeated exposure of the teeth to gastric acids.

- Use of certain drugs, specifically methamphetamine, which has a detrimental effect on oral health. Methamphetamine abuse is associated with rampant decay that is attributed to some combination of the acidic nature of the drug, decreased saliva, tooth grinding and clenching, poor oral hygiene, and cravings for high-calorie beverages.[31]
- Frequent consumption of acidic drinks, which can directly erode the enamel.[32]

Health care professionals should educate adolescents to keep their teeth clean and remove plaque by following a comprehensive, daily home care regimen, including a minimum of twice-daily brushing with fluoride toothpaste and once-daily flossing. It is recommended that the adolescent spit out the toothpaste but not rinse with water. This regimen should be customized to each patient based on risk factors. Adolescents also should follow nutritious eating patterns that include only modest consumption of high-sugar foods (for more information on this topic, see the Promoting Healthy Nutrition theme) and should drink fluoridated water. If necessary, prescribed fluoride supplements until the age of 16 years are appropriate.[33]

Other Oral Health Issues

Adolescence is a period of experimentation and making choices. Added freedom and extension of boundaries are characteristic of appropriate supervision, but certain behaviors can lead to oral health problems. Substance use, including tobacco and drugs, can affect soft and hard tissues of the oral cavity and is linked to oral cancer.[34] Oral piercing can cause local and systemic infection, tooth fracture, and hemorrhage. Sexual behaviors can lead to infectious and traumatic consequences to the mouth. The health care professional should continue to counsel the adolescent about these nondietary behavioral factors that affect oral health.

Substance use, including tobacco and drugs, can affect soft and hard tissues of the oral cavity and is linked to oral cancer.

PERIODONTAL CONDITIONS

Evidence suggests that irreversible tissue damage from periodontal disease begins in late adolescence and early adulthood. Early diagnosis, prevention, and minor treatment can, in most cases, prevent irreversible damage to the periodontal structures in adulthood.[33,35] Preventing this damage obviates the need for dental restorations, which require lifelong care and monitoring.

TRAUMATIC INJURY TO THE MOUTH

Adolescents' risk of traumatic injury to the mouth may be increased by the following:

- High-risk behaviors that may involve trauma to the head and neck
- Driving crashes
- Injuries that occur as a result of participating in organized and leisure-time sports
- Unrecognized psychiatric and behavioral problems, such as bulimia or substance use
- Family or peer violence

Health care professionals should make sure that parents and adolescents know what to do and who to call if an injury occurs and a tooth is fractured or avulsed.

ORTHODONTIA

Genetically related abnormal development, premature primary tooth loss or extraction, or thumb sucking or finger sucking all can result in significant crowding and malalignment of the teeth, which can adversely affect oral health, function, and esthetics. Most orthodontic problems are not debilitating and can be resolved with appropriate treatment.[36] Preventing premature tooth loss early in life has a significant impact on minimizing space loss and the resultant crowding in adolescence.

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Oral Health Risk Assessment Tool

The American Academy of Pediatrics (AAP) has developed this tool to aid in the implementation of oral health risk assessment during health supervision visits.

Instructions for Use

This tool is intended for documenting caries risk of the child, however, two risk factors are based on the mother or primary caregiver's oral health. All other factors and findings should be documented based on the child.

The child is at an absolute high risk for caries if any risk factors or clinical findings, marked with a ⚠ sign, are documented yes. In the absence of ⚠ risk factors or clinical findings, the clinician may determine the child is at high risk of caries based on one or more positive responses to other risk factors or clinical findings. Answering yes to protective factors should be taken into account with risk factors/clinical findings in determining low versus high risk.

Visit: ☐ 6 month, ☐ 9 month, ☐ 12 month, ☐ 15 month, ☐ 18 month, ☐ 24 month, ☐ 30 month, ☐ 3 years, ☐ 4 years, ☐ 5 years, ☐ 6 years, ☐ other_____

RISK FACTORS	PROTECTIVE FACTORS	CLINICAL FINDINGS
⚠ Mother or primary caregiver had active decay in the past 12 months Yes ☐ No ☐	• Existing dental home Yes ☐ No ☐	⚠ White spots or visible decalcifications in the past 12 months Yes ☐ No ☐
• Mother or primary caregiver does not have a dentist Yes ☐ No ☐	• Drinks fluoridated water or takes fluoride supplements Yes ☐ No ☐	⚠ Obvious decay Yes ☐ No ☐
• Continual bottle/sippy cup use with fluid other than water Yes ☐ No ☐	• Fluoride varnish in the last 6 months Yes ☐ No ☐	⚠ Restorations (fillings) present Yes ☐ No ☐
• Frequent snacking Yes ☐ No ☐	• Has teeth brushed daily Yes ☐ No ☐	• Visible plaque accumulation Yes ☐ No ☐
• Special health care needs Yes ☐ No ☐		• Gingivitis (swollen/bleeding gums) Yes ☐ No ☐
• Medicaid eligible Yes ☐ No ☐		• Teeth present Yes ☐ No ☐
		• Healthy teeth Yes ☐ No ☐

Caries Risk: ☐ Low ☐ High

Completed: ☐ Anticipatory Guidance ☐ Fluoride Varnish ☐ Dental Referral

Treatment of High Risk Children

If appropriate, high-risk children should receive professionally applied fluoride varnish and have their teeth brushed daily with an age-appropriate amount of fluoridated toothpaste. Referral to a pediatric dentist or a dentist comfortable caring for children should be made with follow-up to ensure that the child is being cared for in the dental home.

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Adapted from Ramos-Gomez FJ, Crystal YO, Ng MW, Crall JJ, Featherstone JD. Pediatric dental care: prevention and management protocols based on caries risk assessment. *J Calif Dent Assoc.* 2010;38(10):746–761; American Academy of Pediatrics Section on Pediatric Dentistry and Oral Health. Preventive oral health intervention for pediatricians. *Pediatrics.* 2003; 122(6):1387–1394; and American Academy of Pediatrics Section of Pediatric Dentistry. Oral health risk assessment timing and establishment of the dental home. *Pediatrics.* 2003;111(5):1113–1116.

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Section 6.0

New Discussion Items

Computer-aided mammography

Question: Should computer-aided mammography be used for breast cancer screening?

Question source: HERC Staff

Issue: Initially, this topic was considered for a Coverage Guidance. However, due to a lack of a specific predefined trusted source systematic review, this topic was felt to be more appropriate for a VbBS review and a potential Prioritized List modification alone.

Background: The goal of mammography screening is to increase breast cancer detection rates while minimizing false positives and unnecessary recalls. European standards involve two radiologists reviewing mammograms which is uncommon in the US. Computer-aided mammography is designed to alert the reading radiologist to potential areas of breast tissue abnormality and is commonly practiced in the US.

Current Prioritized List Status

Code	Code Description	Current Placement
77051	Computer-aided detection (computer algorithm analysis of digital image data for lesion detection) with further review for interpretation, with or without digitization of film radiographic images; **diagnostic mammography** (List separately in addition to code for primary procedure)	DMAP Diagnostic Procedure File
77052	Computer-aided detection (computer algorithm analysis of digital image data for lesion detection) with further review for interpretation, with or without digitization of film radiographic images; **screening mammography** (List separately in addition to code for primary procedure)	DMAP Diagnostic Procedure File

Evidence Review

Taylor, 2008

1. Systematic review of CAD mammography screening compared to single reading
2. Included 10 studies, all conducted in the US, total of 441,547 individuals.
3. Results:
    a. Cancer detection rate? No statistically significant increase, OR 1.04 (95% CI 0.96 to 1.13, p = 0.35).
    b. Recall rate? Significant increase in the recall rate with CAD, with an overall pooled estimate for an OR of 1.10 (955 CI 1.09 to 1.12, p< 0.001).
4. Conclusions: Double reading with arbitration is superior to double reading without arbitration and is superior to single reading with CAD. Single reading with CAD is effective at increasing recall rates.

Swedish Council on HTA, 2011 report

1. Only 1 study included (Gilbert, 2008)
2. Included 28,204 individuals, and compared single reading plus CAD with double reading in conjunction with mammography screening.
3. Results:
    a. Cancer cases detected? 87.7% with dual reading compared to 87.2% for CAD)
    b. Recall rate? Statistically significantly higher for single reading plus CAD (3.9 percent compared to 3.4 percent for double reading, p<0.001).
4. Generalizability reduced due to all of the breast radiologists participating in the study had extensive experience in mammography screening and comparison not relevant in US practice
5. Conclusions: there were deficiencies in study quality and generalizability, therefore the evidence is insufficient.

Azavedo 2012

1. Systematic review, included 4 RCTs, only one of which was of sufficient quality (moderate, based primarily on QUADAS[1] criteria) to draw conclusions from.
    a. Prospective multicentre study based on the UK national screening program and including 28,204 women aged 50–70 years.
    b. Results:
        i. Single reading + CAD and double reading for cancer detection rate similar (7.02/1000 and 7.06/1000).
        ii. Overall agreement between the two strategies was 74.9% (170/227). However, single reading with CAD gave a significantly higher recall rate (3.9% versus 3.4%; p = 0.001). Compared to double reading, single reading with CAD gave lower sensitivity (87.2% versus 87.7%) and lower specificity (96.9% versus 97.4%) but the differences were not statistically significant. Due to incomplete follow-up, sensitivity was likely to be overestimated. Overall, there was no statistically significant difference between the two strategies as regards pathological characteristics of the 57 detected cancers."
    c. Conclusions: insufficient evidence to determine if single reading + CAD is equivalent to double reading.

<u>Summary</u>

Mammography screening with CAD does not increase the cancer detection rate compared to either single or double reading without CAD, but does increase the recall rate.

[1] Quality Assessment Tool for Diagnostic Accuracy Studies

HERC Staff Recommendations:

1) Recommend to DMAP to remove 77052 from the Diagnostic File and place in the Excluded File
2) Add a Diagnostic Guideline
    A. DIAGNOSTIC GUIDELINE DXX COMPUTER-AIDED MAMMOGRAPHY
    Computer-aided mammography for breast cancer screening (CPT code 77052) is not a covered service.

EUROPEAN JOURNAL OF CANCER 44 (2008) 798–807

available at www.sciencedirect.com

journal homepage: www.ejconline.com

Review

Computer aids and human second reading as interventions in screening mammography: Two systematic reviews to compare effects on cancer detection and recall rate

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Diagnosis, computer-assisted
Image interpretation, computer-assisted
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ABSTRACT

Background: There are two competing methods for improving the accuracy of a radiologist interpreting screening mammograms: computer aids (CAD) or independent second reading.
Methods: Bibliographic databases were searched for clinical trials. Meta-analyses estimated impacts of CAD and double reading on odds ratios for cancer detection and recall rates. Subgroup analyses considered double reading with arbitration.
Results: Ten studies compared single reading with CAD to single reading. Seventeen compared double to single reading. Double reading increases cancer detection and recall rates. Double reading with arbitration increases detection rate (confidence interval (CI): 1.02, 1.15) and decreases recall rate (CI: 0.92, 0.96). CAD does not have a significant effect on cancer detection rate (CI: 0.96, 1.13) and increases recall rate (95% CI: 1.09, 1.12). However, there is considerable heterogeneity in the impact on recall rate in both sets of studies.
Conclusion: The evidence that double reading with arbitration enhances screening is stronger than that for single reading with CAD.

1. Introduction

In many countries, including the UK, it is standard practice for each screening mammogram to be viewed independently by two readers who either confer on discordant cases or refer them for arbitration. It is sometimes argued that this 'double reading' is too expensive or too demanding of radiologists' time.[1] An alternative is to use computer programs that process digitised mammograms and alert readers to possible abnormalities. A systematic review identified six studies comparing computer aids (CAD) to double reading but concluded that they were methodologically flawed and the evidence was limited.[2] This paper takes a different approach: two sets of studies are reviewed:

- studies comparing single reading with CAD to single reading without CAD;
- studies comparing double reading to single reading.

We assess the impact of both interventions on cancer detection and recall rate since an improvement in cancer detection rate at the cost of an increased recall rate may not present an enhancement of the screening test.

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Computer-Aided Detection (CAD) in Mammography Screening

SBU ALERT REPORT NO 2011-05 • 2011-05-18 • WWW.SBU.SE/ALERT

Summary and conclusions

In Sweden, all women aged 50 through 69 years are offered mammography at regular intervals. Most county councils even offer this type of examination to women aged 40 through 49 years and 70 through 74 years. Swedish and European guidelines recommend that two specially trained radiologists (breast radiologists) review the breast images. Computer-aided detection (CAD) is a computerised method for analysing images from e.g. mammography screening. Although the method has existed for approximately 10 years, its clinical use in Sweden is limited.

SBU's appraisal of the evidence

- ❑ The scientific evidence is insufficient to determine whether CAD plus single reading by one breast radiologist would yield results that are at least equivalent to those obtained in standard practice, i.e. double reading where two breast radiologists independently read the x-ray images.
- ❑ Since the medical consequences are uncertain, it is not possible to determine the cost-effectiveness or the socioeconomic consequences of replacing one of the readings with CAD in the context of mammography screening.
- ❑ Since this literature review, CAD technology has advanced further by virtue of improved features in computer software and digitalisation of images. Additional studies are essential to understand the specific benefits, risks, and costs of the method.

Technology and target group

The method under investigation is computer-aided detection (CAD) in breast cancer screening. The target group includes women aged 40 through 74 years who receive mammography within the framework of population-based screening.

The program used in CAD identifies and marks areas that the software identifies as abnormal breast tissue. The CAD program is not intended as the only method to be used when analysing mammography images. Rather, it is designed to alert the radiologist about possibly suspicious areas. Hence, interpretation of the image by a breast radiologist must accompany CAD.

It has been suggested that CAD in conjunction with mammography screening could replace one of the two independent readings that are done in accordance with European and Swedish guidelines. A prerequisite would be that the diagnostic accuracy and patient benefit are as good when the images are read by one breast radiologist plus CAD as when they are read by two breast radiologists. Another important prerequisite is that not too many women need to be called back for further diagnostic work-up (recall). In Europe, the highest recommended recall rate is 5 percent.

High average age among practicing breast radiologists, and poor replacement rate in this group of specialists, has increased the interest for computerised analysis of mammography images.

In this report we have studied whether diagnostic accuracy is at least as good, while recall rates are not higher, when CAD plus single reading by one breast radiologist is used in conjunction with mammography screening instead of independent readings by two breast radiologists.

Primary questions

Is the reading of mammographic images by a single breast radiologist plus CAD at least as accurate as readings by two breast radiologists (current practice) in terms of:

- sensitivity (probability that a person with the disease has a positive test result)?
- specificity (probability that a healthy person has a negative test result)?
- cancer detection rate (number of cancer cases detected per 1 000 women examined)?
- recall rate (women called back for further investigation)?
- cost-effectiveness?

Inclusion criteria

The report includes population-based screening studies only. The studies should include at least 5 000 women and the study settings should be comparable to Swedish conditions. Furthermore, the studies should compare mammography readings by one breast radiologist plus CAD against readings by two breast radiologists. Since prospective studies based on digital mammography could not be identified, scanned analogue images were accepted.

Patient benefit

Recall increases short-term anxiety among the women affected and also increases cost. Therefore, the requirement for using single reading plus CAD is that the method must detect at least as many cancers as double reading, without increasing the recall rate, i.e. the method's specificity must be at least as high as that in double reading.

Only one study of sufficient quality met the inclusion criteria. It compared single reading plus CAD with double reading in conjunction with mammography screening, and reported no difference in the percentage of cancer cases detected. The recall rate, however, was statistically significantly higher for single reading plus CAD (3.9 percent compared to 3.4 percent for double reading). The generalisability of the study is reduced since all of the breast radiologists participating in the study had extensive experience in mammography screening. Therefore, this single study, having deficiencies in study quality and generalisability, cannot be used to draw conclusions (insufficient scientific evidence ⊕○○○).

SBU's assessment shows that the scientific evidence is insufficient to comment on single mammographic reading by one breast radiologist plus CAD in comparison to current practice of double reading involving two breast radiologists.

Economic aspects

Since the medical consequences are uncertain, it is not possible to determine the cost-effectiveness and/or the socioeconomic consequences of replacing one of the readings with CAD in the context of mammography screening.

Four levels are used in grading the strength of the scientific evidence on which conclusions are based:

Strong scientific evidence (⊕⊕⊕⊕). Based on high or medium quality studies with no factors that weaken the overall assessment.

Moderately strong scientific evidence (⊕⊕⊕○). Based on high or medium quality studies with isolated factors that weaken the overall assessment.

Limited scientific evidence (⊕⊕○○). Based on high or medium quality studies having factors that weaken the overall assessment.

Insufficient scientific evidence (⊕○○○). Scientific evidence is deemed insufficient when scientific findings are absent, the quality of available studies is low, or studies of similar quality present conflicting findings.

Project group

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SBU evaluates healthcare technology
The Swedish Council on Health Technology Assessment (SBU) is a national governmental agency that assesses healthcare technologies. SBU analyses the benefits, risks, and costs of different methods and compares the scientific facts to prevailing practices in Sweden. SBU's goal is to provide stronger evidence for everyone engaged in shaping the delivery of health services.

The SBU Alert reports are produced in collaboration with experts from the respective subject areas, the National Board of Health and Welfare, the Medical Products Agency, the Swedish Association of Local Authorities and Regions, and a special advisory panel (the Alert Advisory Board).

This assessment was published in 2011. Findings based on strong scientific evidence usually continue to apply well into the future. However, findings based on insufficient, limited, or contradictory evidence might have already been replaced by more recent findings.

The complete report is available in Swedish.

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ORIGINAL ARTICLE

Single Reading with Computer-Aided Detection for Screening Mammography

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ABSTRACT

BACKGROUND

The sensitivity of screening mammography for the detection of small breast cancers is higher when the mammogram is read by two readers rather than by a single reader. We conducted a trial to determine whether the performance of a single reader using a computer-aided detection system would match the performance achieved by two readers.

METHODS

The trial was designed as an equivalence trial, with matched-pair comparisons between the cancer-detection rates achieved by single reading with computer-aided detection and those achieved by double reading. We randomly assigned 31,057 women undergoing routine screening by film mammography at three centers in England to double reading, single reading with computer-aided detection, or both double reading and single reading with computer-aided detection, at a ratio of 1:1:28. The primary outcome measures were the proportion of cancers detected according to regimen and the recall rates within the group receiving both reading regimens.

RESULTS

The proportion of cancers detected was 199 of 227 (87.7%) for double reading and 198 of 227 (87.2%) for single reading with computer-aided detection ($P=0.89$). The overall recall rates were 3.4% for double reading and 3.9% for single reading with computer-aided detection; the difference between the rates was small but significant ($P<0.001$). The estimated sensitivity, specificity, and positive predictive value for single reading with computer-aided detection were 87.2%, 96.9%, and 18.0%, respectively. The corresponding values for double reading were 87.7%, 97.4%, and 21.1%. There were no significant differences between the pathological attributes of tumors detected by single reading with computer-aided detection alone and those of tumors detected by double reading alone.

CONCLUSIONS

Single reading with computer-aided detection could be an alternative to double reading and could improve the rate of detection of cancer from screening mammograms read by a single reader. (ClinicalTrials.gov number, NCT00450359.)

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*The members of the Computer-Aided Detection Evaluation Trial II (CADET II) group are listed in the Appendix.

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BMC Medical Imaging

RESEARCH ARTICLE Open Access

Is single reading with computer-aided detection (CAD) as good as double reading in mammography screening? A systematic review

Edward Azavedo[1,4], Sophia Zackrisson[2*], Ingegerd Mejàre[3] and Marianne Heibert Arnlind[3,4]

Abstract

Background: In accordance with European guidelines, mammography screening comprises independent readings by two breast radiologists (double reading). CAD (computer-aided detection) has been suggested to complement or replace one of the two readers (single reading + CAD).
The *aim* of this systematic review is to address the following question: Is the reading of mammographic x-ray images by a single breast radiologist together with CAD at least as accurate as double reading?

Methods: The electronic literature search included the databases Pub Med, EMBASE and The Cochrane Library. Two independent reviewers assessed abstracts and full-text articles.

Results: 1049 abstracts were identified, of which 996 were excluded with reference to inclusion and exclusion criteria; 53 full-text articles were assessed for eligibility. Finally, four articles were included in the qualitative analysis, and one in a GRADE synthesis.

Conclusions: The scientific evidence is insufficient to determine whether the accuracy of *single reading + CAD* is at least equivalent to that obtained in standard practice, i.e. *double reading* where two breast radiologists independently read the mammographic images.

Keywords : CAD, Mammography, Screening, Breast, Cancer, Single reading, Double reading

Background

Following reports from Swedish randomized trials [1-4], breast cancer screening programs with mammography have been established in recent decades in many countries [5]. The age range of women invited to screening varies between countries. The Swedish National Board of Health and Welfare recommends mammography screening at regular intervals to all women between 40 and 74 years. The initial results from the randomized trials, showing a reduction in mortality in breast cancer, have been confirmed by long-term follow-up [6,7] Similar results have been obtained in established population-based service screening programs [8,9]. However, the pros and cons of mammography screening and how the results should be interpreted [10] are still matters for debate.

Besides the primary aim of detecting breast cancers in screening programs, it is important that recall rates are kept as low as possible without impairing detection rates. In this respect, the recommended recall rate in Sweden and in the rest of Europe should not exceed five per cent [11]. The reasons for recall are several, such as suspicious findings suggesting malignancy, indeterminate findings that need further work-up, and occasionally for technical reasons or if the woman reports clinical symptoms at the time of the screening examination.

As the radiological image of breast tissue is complex, mammograms need to be interpreted by highly specialized radiologists. Figure 1 shows an example of mammography images.

Factors that affect the ability to detect a breast cancer (sensitivity) are e.g. the prevalence of breast cancer in the target population, dense breast tissue, the frequency

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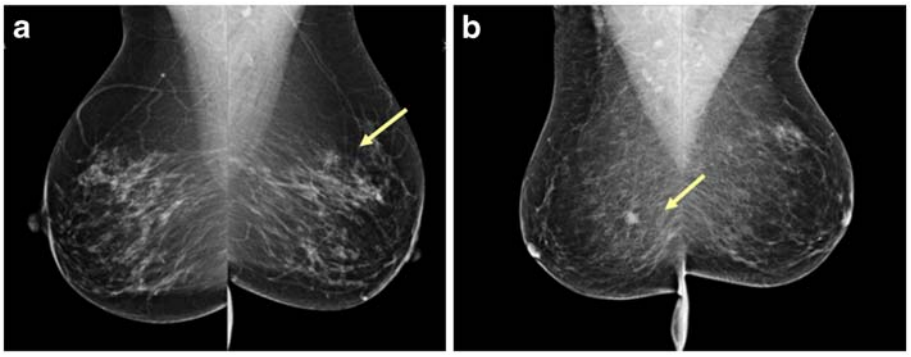

Figure 1 Figure 1a shows a rather hard to detect breast cancer in the left breast (arrow); the right breast is normal. Figure 1b shows an easily detected cancer in the right breast (arrow); the left breast is normal.

of tumours with subtle mammographic signs, and suboptimal technical quality. These factors, combined with high daily volumes (each Swedish screening centre usually screens more than 20,000 women annually), makes accurate screening a challenging task. Sensitivity levels of 70–85% and specificity levels of 82–98% at mammography screening have been reported [5]. In order to maintain high sensitivity and specificity, resulting in high cancer detection rates and low false-positive rates, Swedish and European guidelines recommend double reading, i.e. that the breast images are reviewed by two specially trained radiologists (breast radiologists). Double reading has been shown to increase cancer detection rates by 5–17% [12].

Computer-aided detection (CAD) is a computerized method for analysing images in mammography screening. Although the method has existed for approximately 10 years, its contribution to routine screening is still debatable [13-15]. The program used in CAD identifies and marks areas which the software identifies as abnormal breast tissue. The CAD program is not intended to be the sole method for analysing mammography images. Rather, it is designed to alert the radiologist to possibly suspicious areas. Hence, a radiologist must interpret and make a decision to act upon (accept or dismiss) each CAD mark. On average, each screening examination generates two false positive marks; CAD gives 400 false positive marks for each true positive mark [16].

Lack of an adequate number of trained breast radiologists has led to a growing interest in computerized analysis of mammography images. There has been a discussion as to whether CAD in conjunction with mammography screening could replace one of the breast radiologists. A prerequisite would be that diagnostic accuracy and patient benefit are at least equivalent to what is achieved when the mammographic images are read by two breast radiologists. Another important prerequisite is that not too many women need to be recalled for further diagnostic work-up.

The value of CAD in mammography screening has been questioned in earlier reviews [17,18]. The literature is scarce on studies performed in authentic screening situations. As the performance of CAD systems has improved considerably, it was considered appropriate to reassess the performance of CAD in population-based screening programs.

This review is part of a comprehensive systematic review, published in Swedish by SBU (Swedish Council on Health Technology Assessment), of computer-aided detection (CAD) as a diagnostic method in mammography screening [19]. SBU is an independent government agency for the critical evaluation of methods for preventing, diagnosing and treating health problems.

The objective of the present is systematic review is to address the following question: Is the reading of mammographic images by a single breast radiologist plus CAD at least as accurate as readings by two breast radiologists (current practice) in terms of:

- sensitivity (probability that a person with the disease has a positive test result);
- specificity (probability that a healthy person has a negative test result);
- cancer detection rate (number of cancer cases detected per 1,000 women examined);
- recall rate (proportion of women who are recalled for further investigation); and
- cost-effectiveness?

Methods

CAD (Computer-aided detection)

CAD research has been developed over the past two decades. CAD was first applied to digitized (scanned) screen-film mammograms (SFM). The introduction of full-field digital mammography (FFDM) has led to intensified efforts to optimise the method. CAD makes a computerized analysis of mammograms and identifies areas that need to be reviewed. The precise algorithms

used by different CAD suppliers are still a commercial secret and are not further reviewed here. Two types of marks are generally used: one for microcalcifications and the other for other mammographic features such as density, mass and distortion. The systems can be adjusted to yield very high sensitivity but at the cost of specificity, generating a high rate of false positive marks.

According to a recent review, the sensitivity of CAD for microcalcifications representing malignancies is 98–99% [16]. However, only 15–20% of detected cancers present as microcalcifications on screening mammograms [20]. The same review reports that the sensitivity of CAD for other mammographic features representing malignancies ranges from 89 to 75%, in some cases down to 50%.

It has been assumed that CAD will be used increasingly with the transition from analogue to digital mammography. The reproducibility of CAD prompts in FFDM is expected to be more consistent than with scanned mammograms. The primary inclusion criterion in this review was CAD on FFDMs. However, when prospective studies based on FFDM could not be found, scanned analogue images were accepted.

Literature search and selection of articles

The electronic literature search included the databases PubMed, EMBASE, and The Cochrane Library from 1950 to November 2011. All Western European languages were accepted. The Mesh terms were: Breast neoplasms, Breast, Mammography, Breast (TW), Mammography (TW) AND Computer aided detection (TW) AND Computer aided diagnosis (TW) AND Cad (TW), and Economic aspects. The complete search strategy can be provided on request.

The electronic searches yielded 1049 abstracts (Figure 2). Two reviewers (EA and SZ) read the abstracts independently. An article was read in full text if at least one of the two reviewers considered an abstract to be potentially relevant. Hand search and grey literature did not result in any additional articles. The

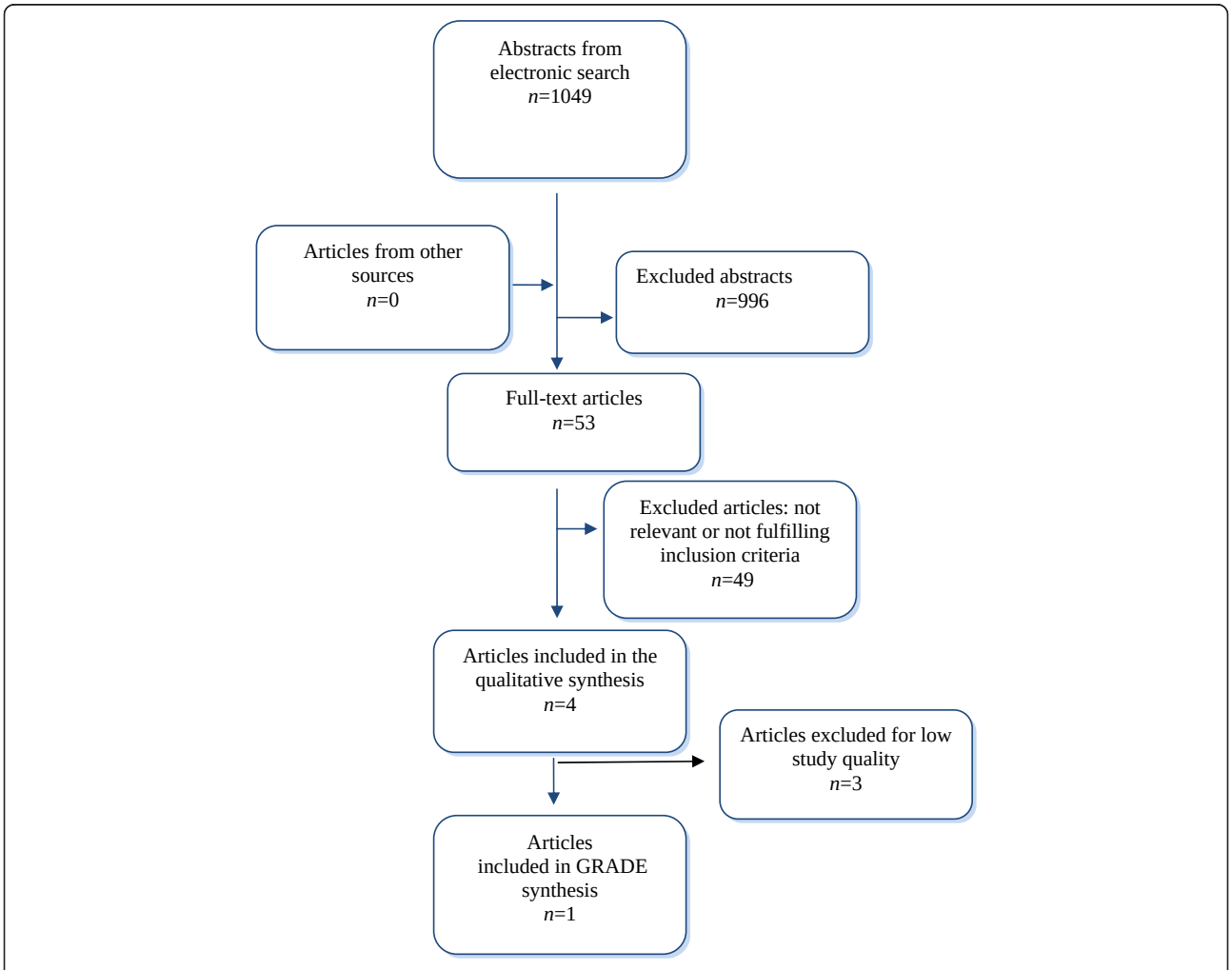

Figure 2 Flow chart of the search strategy.

pre-specified inclusion/exclusion criteria are given below. Altogether, 53 articles were read in full text and assessed independently by the same two reviewers using the QUADAS tool [21]. Of the 53 articles, 49 did not fulfil the inclusion criteria and were excluded from further analysis. A list of excluded articles with the main reason for exclusion is available on request.

PICO elements were used to describe the population, index test, reference test and outcome:

P – Population: women, 40–74 years old, participating in mammography screening
I – Intervention (index test): CAD + one breast radiologist (single reading)
C – Control (reference test): reading by two independent radiologists (double reading)
O – Outcome: sensitivity, specificity, cancer detection rate and recall rate

The inclusion criteria were:

- population-based screening
- ≥5,000 women included
- study setting corresponding to Swedish conditions
- follow-up time ≥ 12 months
- mammography readings with one breast radiologist + CAD compared with readings by two breast radiologists.

Assessment of diagnostic accuracy

The diagnostic accuracy (validity) of a test (index test) requires a reference standard (reference test) for comparison. Two index tests were used here: 1) CAD + single reading, and 2) double reading. The reference standard should reflect the reality as closely as possible and the ideal gold standard is histopathological verification. However, biopsying all individuals is not feasible when screening an asymptomatic population. The reference standard in this review was biopsy of suspected cases or follow-up. The ultimate outcome was survival. Because no randomized controlled trials have been performed to document changes in survival following the use of double reading compared to single reading with CAD, surrogate outcomes such as cancer detection rate and recall rate are used. The main outcome measures are sensitivity and specificity. Sensitivity is the number of true positive tests divided by the total number of true cancer cases. Specificity is the number of true negative tests divided by the total number of healthy breast cases. In addition, cost-effectiveness has been considered.

Rating quality of individual studies

The quality of each included study was rated high, moderate or low according to pre-specified criteria given in Table 1.

Rating evidence across studies

The quality of the evidence of each method's/test's diagnostic accuracy was rated in four levels according to GRADE [22] [23]:

- High (⊕⊕⊕⊕). Based on high or moderate quality studies containing no factors that weaken the overall judgement.
- Moderate (⊕⊕⊕O). Based on high or moderate quality studies containing isolated factors that weaken the overall judgement.
- Limited (⊕⊕OO). Based on high or moderate quality studies containing factors that weaken the overall judgement.
- Insufficient (⊕OOO). The evidence base is insufficient when scientific evidence is lacking, the quality of available studies is low or studies of similar quality are contradictory.

Table 1 Criteria of high, moderate and low study quality, mainly according to QUADAS [21]

High: small risk of bias	Prospective study design. Particular emphasis on the following: ● adequately described patients constituting a representative and clinically relevant sample (QUADAS items 1, 2). ● the index test should not form part of the reference standard (item 7). ● evaluators should be masked to results of index test and reference test (items 10, 11) ● the tests should be described in sufficient detail to permit replication (items 8, 9). ● sample size ≥ 5000. ● diagnostic accuracy presented as sensitivity and specificity.
Moderate: moderate risk of bias	Prospective study design Since no prospective studies based on digital mammography could be identified, scanned analogue images were accepted. Otherwise the same criteria as for high quality were required.
Low: high risk of selection and/or verification bias	Retrospective study design. Selected or enriched samples

Table 2 Main characteristics, results and quality rating of four studies on mammography screening

Author, Year (ref)	Study design, Study period, Population, Readers	Index test (I)	Reference test	Results CI= confidence interval Se= sensitivity Sp=specificity	Study quality, Comments
Gilbert et al., 2008 [71]	Prospective, multicentre 2006-2007	I.1: single reading + CAD, n=28,204	Biopsy of suspected cases or follow-up (not all, though; number not reported)	*Cancer detection rate:*	Moderate
				Single reading + CAD: 7.02 /1000.	
	Population:			Double reading: 7.06/1000.	Restricted generalisability since results were based on single reading +CAD by experienced radiologists.
	Initially invited: 68,060 women.	I.2: double reading, n=28,204.		Difference not statistically significant (NS).	
	Investigated: 28,204.			*Recall rate:*	Incomplete follow-up, particularly affecting the estimates of sensitivity.
	Aged 50-70 years (1 % > 70 years).			Single reading + CAD: 3.9 %.	
				Double reading: 3.4 %.	Scanned analogue mammograms.
	Readers: radiologists (n=17), specially trained staff (n=10).			Difference 0.5 % (95 % CI: 0.3;0.8).	
				Accuracy:	
				Single reading + CAD:	
				Se= 87.2 %	
				Sp= 96.9 %	
	All readers had at least 6 years' experience and >5000 readings/year			Double reading:	
				Se= 87.7 %	
				Sp= 97.4 %	
				Difference in sensitivity:	
				0.5 % (95 % CI:	
				-7.4;6.6), (NS).	
				Difference in specificity 0,5% (CI not specified but reported NS).	
Gromet et al., 2008 [69]	Retrospective	I.1: Single reading + CAD	Biopsy and follow-up	*Cancer detection rate:*	Low
	Population:			Single reading + CAD: 4.2/1000.	Retrospective study (controlled for age and time since last screening).
	231 221 women			Double reading: 4.46/1000 (NS).	
	2001-05	n=118,808.			Follow-up time unclear.
	Readers:	I.2: Double reading			Screening situation not applicable to European conditions
	Single reading + CAD: specialists in mammography.	n=112,413.		*Recall rate:*	
				Single reading + CAD: 10.6 %.	

Table 2 Main characteristics, results and quality rating of four studies on mammography screening *(Continued)*

	Double reading: Specialists in mammography + radiology.			Double reading:11.9%. Difference statistically significant (p=0.001). *Accuracy:* Single reading + CAD: Se= 90.4 % Double reading: Se=88.0 %. Difference statistically significant. Percent of recalled with cancer: Single reading + CAD: 3.9%. Double reading: 3.7%(NS).	(i.e. recall rate higher than accepted in Europe). Invitation procedure and blinded readings unclear. Scanned analogue mammograms.
Georgian-Smith et al., 2007 [68]	Prospective *Study period:* 2001-03 *Population:* 6381 consecutive screening examinations *Readers:* Experienced breast radiologists Single reading + CAD. Double reading: Not independent reading.	I.1: Single reading + CAD n=6381. I.2: Double reading n=6381.	Biopsy and at least 12 months´ follow-up to detect false negatives.	*Cancer detection rate:* Single reading +CAD: 2.0/1000. Double reading: 2.4/1000 (NS). *Recall rate:* Single reading +CAD: 7.87%. Double reading: 7.93% (NS). *Accuracy:* Sensitivity and specificity not reported.	Low Screening situation not applicable to European conditions. Invitation procedure not described. Population, selection criteria, withdrawals unclear. Not independent double reading but blinded to CAD Number of recalls based on all readings. Scanned analogue radiographs.
Khoo et al., 2005 [70]	Prospective *Study period:* not reported. *Population:* 6,111 women (45-94 years), screening every 3rd year	I.1: Single reading +CAD n= 6111. I.2: Double reading n= 6111.	Biopsy Not reported No follow-up	*Cancer detection rate:* Total for double reading + single reading + symptomatic patients:10/1000. Not reported individually for the groups. *Recall rate:* Single reading + CAD: 6.1%. Double reading: 5.0 %.	Low A so-called relative sensitivity used since 3-year follow-up not yet achieved. Relatively high screening age and long screening intervals. Unclear whether the readings were blinded. Incomplete follow-up.

Table 2 Main characteristics, results and quality rating of four studies on mammography screening *(Continued)*

	Readers: Radiologists (n=7) and specially trained staff (n=5). Double reading not always performed by two radiologists.	Difference statistically significant *Accuracy:* (relative sensitivity)* Single reading + CAD: Se= 91.5%. Double reading: Se= 98.4% (NS).	Scanned analogue radiographs.

* Relative sensitivity= number of detected cancer cases per reader divided by all detected cancer cases (due to lack of follow-up).

Table 3 Quality of evidence of the difference between single reading (radiologist plus CAD) and double reading (two radiologists) related to cancer detection rate and recall rate in mammography screening (GRADE). Data from Gilbert et al. [71]

Outcome	Sample size (no. of studies)	True positive: Single reading + CAD (95% CI)	True positive: Double reading (95% CI)	Absolute difference (95%CI)	Quality of evidence	Rating based on study design/quality, indirectness, consistency, precision and publication bias**
Cancer detection rate	28,204 (1)	0.702%	0.706%	0.004%	(⊕OOO)	Study quality –1
		(0.6–0.8)	(0.6–0.8)	(NS*)	Insufficient	Indirectness–1
Recall rate	28,204 (1)	3,9%	3,4%	0,5%	(⊕OOO)	Study quality –1
		(3,7–4,1)	(3,2–3,6)	(0,3–0,8)	Insufficient	Indirectness -1 One study –1

*NS = no statistically significant difference.
** Study quality = Risk of bias, that is, sensitivity probably overestimated due to incomplete follow-up of women with negative test results.
Indirectness = Only breast radiologists with long clinical experience took part in the study.
Lack of precision = The difference in sensitivity between double reading and single reading + CAD has wide confidence intervals.

Applying GRADE serves to obtain answers to the following questions. How much confidence can one have in a particular estimate of effect? Is the result sustainable, or is it likely that new research findings will change the evidence in the foreseeable future? The rating starts at high, but confidence in the evidence may be reduced for several reasons, including limitations in the study design and/or quality, inconsistency or indirectness of results, imprecise estimates and probability of publication bias. Any disagreements on inclusion/exclusion criteria, rating quality of individual studies or quality of evidence of test methods were solved by consensus.

- Sensitivity = probability that a person with a disease has a positive test result.
- Specificity = probability that a healthy person has a negative test result.
- Relative sensitivity = number of detected cancer cases per reader divided by the total number of detected cancer cases.
- Population based mammography screening = all women in certain age groups receive a personal mailed invitation to get a mammogram at regular intervals (1.5 – 3 years)
- Cancer detection rate = the number of cancer cases detected per 1000 women examined.
- Recall rate = the number of women per 1000 woman recalled for further investigation.
- Interval cancer = cancer cases detected between two screening occasions.

Results

The results of the literature search and the outcome of the selection procedures are shown in a flow chart (Figure 2).

Fifty-three articles were reviewed in full text. Nine of them were review articles [12,16-18,24-28]. Many studies had not been performed in screening settings or had selected or enriched populations, sometimes without comparison between single reading + CAD and double reading [14,29-57]. Nine studies had large populations, but compared only single reading + CAD with single reading [58-66]. One study that only described different cancer types was excluded [67].

Four studies were included in the summary results, Table 2 (see Additional file 1). Three of them had methodological shortcomings and were judged to be of low quality [68-70]. Only one study, of moderate quality, was included in the GRADE synthesis, Table 3 [71]. This was a prospective multicentre study based on the UK national screening program and including 28,204 women aged 50–70 years. No statistically significant difference was found between single reading + CAD and double reading for cancer detection rate (7.02/1000 and 7.06/1000). The overall agreement between the two strategies was 74.9% (170/227). However, single reading with CAD gave a significantly higher recall rate (3.9% versus 3.4%; $p = 0.001$). Compared to double reading, single reading with CAD gave lower sensitivity (87.2% versus 87.7%) and lower specificity (96.9% versus 97.4%) but the differences were not statistically significant. Due to incomplete follow-up, sensitivity was likely to be overestimated. Overall, there was no statistically significant difference between the two strategies as regards pathological characteristics of the 57 detected cancers. Study results are reported in Tables 2 and 3.

Because of their shortcomings, the remaining three studies were not considered in our conclusions. However they deserve to be described. Two were conducted in the U.S.A. [68,69], where population-based screening programs are not used. The populations are less well described and it is not clear whether the women received a personal invitation or had sought to get for mammography on their own. Moreover, recall rates were 8–12%, notably higher than recommended in Sweden and Europe (<5%). The larger of these two studies was retrospective and included 231,221 women who underwent mammography screening [69]. The other study was prospective with 6381 consecutive screening examinations [68]. Their results showed no statistically significant difference in cancer detection rate and the recall rates were inconsistent.

The third study was conducted within the framework of the United Kingdom National Health Service Screening Programme [70]. It was prospective and included 6111 screening examinations with a relatively high total cancer detection rate; 10/1000 including those detected by double reading and single reading with CAD and because of symptoms. Even women over 64 years of age (the upper limit for screening in the UK) were included, which may partly explain the relatively high prevalence of cancer cases. Another explanation may be that the interval between screening sessions was three years (usually 1.5-2 years in Europe). Due to lack of follow-up, the authors calculated a so-called relative sensitivity, where single reading + CAD gave a lower but not statistically significantly different sensitivity of 91.5% compared to 98.4% with double reading. Single reading + CAD had a significantly higher recall rate (6.1%) compared to double reading (5.0%).

To conclude, these three studies show partly conflicting results and it is difficult to draw any conclusions. According to Gilbert et al. [71], the two reading methods resulted in equal numbers of cancer cases. However, this was achieved at the expense of a statistically significantly higher recall rate, implying unnecessary additional examinations. Recall rates in the two studies from the USA [68,69] were two to three times higher than in

Sweden (average 3% [20,72]) and not in accordance with European guidelines (<5% [11]).

Economic aspects

The results of the literature search on economic aspects show that out of 44 abstracts, only one led to the inclusion of the full-text article [14]. The medical scientific evidence was insufficient to study cost-effectiveness and the quality of the study was judged to be low.

Discussion

The results of this systematic review indicate that the scientific evidence is insufficient to determine whether single mammographic reading by one breast radiologist + CAD is as accurate as the current practice of double reading involving two breast radiologists.

CAD has been developed to act as a second reader for two main reasons: to enhance the diagnostic sensitivity of mammography screening and to compensate for the lack of trained breast radiologists. Most of the literature on CAD for mammography comprises studies concerning technical aspects, such as improvements to software, analysis of subtypes of breast cancer, e.g. microcalcifications only, densities only, distortions or combinations of these. The majority of the clinical studies was performed on selected materials enriched with cancer cases, and thus did not represent a true screening situation. Furthermore, comparison with double reading was not a standard procedure in many of the studies. Since the aim of this review was to critically evaluate the scientific evidence of CAD's performance in large population-based screening programs, only four studies met our strict inclusion criteria [68-71]. Of these, only one was considered to have sufficient relevance and quality [71].

Two major shortcomings in study design apply to all four included studies. One is survival rate, which is the most important outcome in mammography screening. None of these studies compared the survival rates with the two strategies, and therefore the present outcome measures (cancer detection rate and recall rate) can be regarded as surrogate outcomes. The other shortcoming is incomplete follow-up. As pointed out in the study by Gilbert et al. [71], sensitivity will be overestimated because of this shortcoming.

Although the study by Gilbert et al. [71] comprised a large population and had an elaborate study set-up, its generalisability is limited since all participating breast radiologists had extensive experience of mammography screening. This is not always the case in an authentic setting. The impact of CAD performance on scanned analogue radiographs as compared to digital mammography is also a matter of concern.

Initially, all CAD studies were performed on scanned analogue mammograms that were analysed with CAD. Over time there has been a transition from analogue to digital mammography and this process is still ongoing in many parts of the world. The reliability of CAD analysis of scanned films has been questioned [73]. This aspect, together with the fact that modern mammography is performed in a digital environment, implies that new studies are required to fully understand CAD's performance and outcomes in large population-based screening programmes using digital mammography.

Lack of trained radiologists remains a problem even when CAD is used. Using CAD as a first/second reader due to unavailability of a trained breast radiologist could be unsustainable, for instance due to retirement. In any case, new generations of breast radiologists must be secured. Besides, being able to discuss uncertain cases with an experienced colleague is absolutely essential, both for educational purposes and in order to avoid too many false positives/false negatives. When working with CAD, a single radiologist will always have to make the final decision to recall or not to recall a woman for further work-up. This decision may depend on a single CAD mark in an area where the radiologist did not react initially. In our opinion, the single radiologist using CAD needs to be highly experienced, particularly when deciding not to recall a woman for further work-up when a potential cancer might be missed. In conclusion, education and training of new generations of breast radiologists have to be done irrespective of the use of CAD, although it has been suggested that CAD could be used in the training of radiologists [74].

As pointed out earlier, screening policies vary between countries and this review has been performed from a European perspective. However, all screening settings have some features in common, be they population-based, centrally-organized or non-organized ("wild" or "opportunistic" screening) mammographies on asymptomatic women. High throughput is one of these factors that place high demands on smooth screening workflows. Integrating CAD into the workflow would mean that the radiologist would have actively to consider all CAD prompts, which in turn increases the total reading time.

High recall rates imply that more women have to return for additional investigation, involving new mammographic images and often also ultrasound examination. In addition, some have to undergo biopsy and in some cases even surgery. This also means more visits to doctors/hospitals for these women. Overall, additional resources are required and women are worried unnecessarily. Since the medical consequences are not convincingly positive, it is not possible to determine either the cost-effectiveness and/or the socioeconomic consequences of replacing one of the readers with CAD in the context of mammography screening.

Conclusions

The conclusions from this systematic review are:

- The scientific evidence is insufficient to determine whether CAD + *single reading* by one breast radiologist would yield results that are at least equivalent to those obtained in standard practice, i.e. *double reading* where two breast radiologists independently read the mammographic images.
- Since the medical consequences are uncertain, it is not possible to determine the cost-effectiveness or the socioeconomic consequences of replacing one of the readings with CAD in the context of mammography screening.
- Since this literature review, CAD technology has advanced further, thanks to improvements in computer software and digitalization.
- Additional prospective and preferably randomized population-based studies are essential to understand the method's specific benefits, consequences, and costs.

Competing interest

The authors declare that they have no competing interest.

Authors' contributions

EA: Study concept, analysis, interpretation of data and drafting the manuscript. SZ: Study concept, analysis, interpretation of data and drafting the manuscript. IM: Study concept, analysis, interpretation of data and drafting the manuscript. MHA: Study concept, analysis, interpretation of data and drafting the manuscript. All four authors are responsible for the content and writing of the paper and approved the final manuscript.

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Electric Tumor Treatment Field

Question: should electronic tumor treatment fields (TTF) be added to the Prioritized List for treatment of recurrent glioblastoma?

Question source: Dr. Don Thieman, OHP medical director

Issue: two new HCPCS codes were added for 2014 for TTF. These codes were not reviewed with the 2014 HCPCS codes as they are DME codes, which are normally on the Ancillary List. TTF involves a portable device which delivers low-intensity, intermediate frequency electric fields via non-invasive, transducer arrays. It is thought to physically interfere with tumor cell division.

A4555	Electrode/transducer for use with electrical stimulation device used for cancer treatment, replacement only
E0766	Electrical stimulation device used for cancer treatment, includes all accessories, any type

ICD-9 191.9 (Malignant neoplasm of brain, unspecified) on line 320 CANCER OF BRAIN AND NERVOUS SYSTEM

From Dr. Thieman

> We have a request…for electric tumor treatment field, or alternating electric field, of supratentorial post-treatment recurrence of glioblastoma. The primary, and covered, treatment is Avastin. Results on slowing tumor growth with no proven survival benefits between ETTF and Avastin in the large manufacturer-sponsored trial were about equal, with less side effects and somewhat better quality of life during treatment for the ETTF device (NovoTTF-100A.)
>
> The $19,500 monthly cost for device rental and disposable electrodes is huge, so I'm hoping you are giving this some scrutiny for whether it should be covered or specifically excluded for OHP Plus, given the limited marginal benefit and high cost.

Evidence

1) **NCCN 2013**
    a. Treatment recommendation for recurrent glioblastoma
        i. Consider alternating electric field therapy (category 2B)
        ii. FDA approved in 2011 for treatment of recurrent glioblastoma. Approval was based on results of a clinical trial that randomized 237 patients to TTF or chemotherapy. Similar survival was observed in the two arms, and TTF

therapy was associated with lower toxicity and improved quality of life.

2) **Omura 2013**, review of treatment of glioblastoma
    a. Recently, the use of low-intensity alternating electric fields applied to the brain through a portable device (NovoTTF-100A; Novocure) has received FDA approval for recurrent glioblastoma. Approval was based on a phase 3 trial showing equivalent efficacy and a superior toxicity profile in the device group relative to a control group consisting of the treating physician's choice of chemotherapy. However, the device's efficacy was modest, and a noninferiority design, required for this type of comparison, was not used; the role of NovoTTF-100A in glioblastoma remains unclear (class IIb, level B).
3) **Stupp 2012**, phase 3 trial of TTF
    a. Chemotherapy vs TTF for recurrent glioblastoma
    b. N=237 (120 TTF, 117 chemotherapy)
    c. Median survival was 6.6 versus 6.0 months (hazard ratio 0.86 [95% CI 0.66–1.12]; p = 0.27), 1-year survival rate was 20% and 20%, progression-free survival rate at 6 months was 21.4% and 15.1% (p = 0.13), respectively in TTF and active control patients. Responses were more common in the TTF arm (14% versus 9.6%, p = 0.19). The TTF-related adverse events were mild (14%) to moderate (2%) skin rash beneath the transducer arrays. Severe adverse events occurred in 6% and 16% (p = 0.022) of patients treated with TTF and chemotherapy, respectively. Quality of life analyses favoured TTF therapy in most domains.
    d. Conclusions: This is the first controlled trial evaluating an entirely novel cancer treatment modality delivering electric fields rather than chemotherapy. No improvement in overall survival was demonstrated, however efficacy and activity with this chemotherapy-free treatment device appears comparable to chemotherapy regimens that are commonly used for recurrent glioblastoma. Toxicity and quality of life clearly favoured TTF.
    e. Note: multiple authors with conflicts of interest

Other policies

1) Anthem BCBS 2014
    a. **Investigational and Not Medically Necessary:** The use of devices to generate electric tumor treating fields (TTF) as a treatment for malignant tumors is considered **investigational and not medically necessary**

2) Aetna 2013
    a. Aetna considers devices to generate electric tumor treatment fields (ETTF) medically necessary as monotherapy for persons with

histologically confirmed glioblastoma (World Health Organization grade IV astrocytoma), after histologically or radiologically confirmed recurrence in the supratentorial region of the brain after receiving chemotherapy.

Cost information

Per CareOregon:

ETTF would cost approximately $19,500/month (actual cost depends on the cancer center contract, local DME vendor price, etc.).

Cost for Avastin (bevacizumab) is weight-based: 70 kg = $9,000 per month, 100 kg = $13,000 per month.

HERC Staff Recommendations:

1) Create a new category for technology/procedures reviewed but not placed on the Prioritized List
    a. Reviewed technology will no longer be on the "Excluded List"
    b. Most easily searchable for partner organizations
2) Place review of A4555 and E0766 (electronic tumor treatment fields) in this new section
    a. Equal effectiveness to conventional chemotherapy with higher cost.

HERC Reviews of Health Technology for Items Not Placed on the Prioritized List

ELECTRONIC TUMOR TREATMENT FIELDS

Most recent review date: 5/8/2014

Electronic tumor treatment field therapy (ETTF; HCPCS A4555 and E0766) has been found to be equally effective to conventional chemotherapy for treatment of recurrent glioblastoma, but significantly higher cost. HERC recommends that ETTF be second line treatment for recurrent glioblastoma. No evidence was found for the use of ETTF for indications other than recurrent glioblastoma. See VBBS/HERC minutes from 5/8/14 for details [link].

Review

Glioblastoma and Other Malignant Gliomas
A Clinical Review

Antonio Omuro, MD; Lisa M. DeAngelis, MD

IMPORTANCE Glioblastomas and malignant gliomas are the most common primary malignant brain tumors, with an annual incidence of 5.26 per 100 000 population or 17 000 new diagnoses per year. These tumors are typically associated with a dismal prognosis and poor quality of life.

OBJECTIVE To review the clinical management of malignant gliomas, including genetic and environmental risk factors such as cell phones, diagnostic pitfalls, symptom management, specific antitumor therapy, and common complications.

EVIDENCE REVIEW Search of PubMed references from January 2000 to May 2013 using the terms *glioblastoma*, *glioma*, *malignant glioma*, *anaplastic astrocytoma*, *anaplastic oligodendroglioma*, *anaplastic oligoastrocytoma*, and *brain neoplasm*. Articles were also identified through searches of the authors' own files. Evidence was graded using the American Heart Association classification system.

FINDINGS Only radiation exposure and certain genetic syndromes are well-defined risk factors for malignant glioma. The treatment of newly diagnosed glioblastoma is based on radiotherapy combined with temozolomide. This approach doubles the 2-year survival rate to 27%, but overall prognosis remains poor. Bevacizumab is an emerging treatment alternative that deserves further study. Grade III tumors have been less well studied, and clinical trials to establish standards of care are ongoing. Patients with malignant gliomas experience frequent clinical complications, including thromboembolic events, seizures, fluctuations in neurologic symptoms, and adverse effects from corticosteroids and chemotherapies that require proper management and prophylaxis.

CONCLUSIONS AND RELEVANCE Glioblastoma remains a difficult cancer to treat, although therapeutic options have been improving. Optimal management requires a multidisciplinary approach and knowledge of potential complications from both the disease and its treatment.

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CME Quiz at jamanetworkcme.com and **CME Questions** 1853

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Section Editor: Mary McGrae McDermott, MD, Senior Editor.

Malignant brain tumors are among the most feared types of cancer, not only for their poor prognosis, but also because of the direct repercussions on quality of life and cognitive function. Prevalence studies estimate that 138 054 patients had a diagnosis of a primary malignant brain tumor in the United States in 2010.[1] Malignant gliomas are the most common type of primary malignant brain tumor, accounting for 80% of patients and an annual incidence of 5.26 per 100 000 population, or 17 000 new cases diagnosed per year.[2] This disease is most common in the sixth through eighth decades of life[2]; the number of patients is expected to increase with the aging of the population.

Internists, family practitioners, and emergency physicians are likely to be the first to encounter patients with a primary brain tumor and will typically remain involved in their care throughout the entire disease course (**Box 1**). This review focuses on the practical aspects involved in the clinical management of malignant gliomas that such professionals may encounter.

Methods

References were identified through PubMed searches from 2000 to 2013, using the terms *glioblastoma*, *glioma*, *malignant glioma*, *anaplastic astrocytoma*, *anaplastic oligodendroglioma*, *anaplastic oligoastrocytoma*, and *brain neoplasm*. Articles were also identified through searches of the authors' own files. The American Heart Association classification of recommendations and levels of evidence was used to grade the quality of evidence.[3]

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NovoTTF-100A versus physician's choice chemotherapy in recurrent glioblastoma: A randomised phase III trial of a novel treatment modality

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KEYWORDS
Glioblastoma
Brain tumour
Chemotherapy
Randomised trial

Abstract ***Purpose:*** NovoTTF-100A is a portable device delivering low-intensity, intermediate frequency electric fields via non-invasive, transducer arrays. Tumour Treatment Fields (TTF), a completely new therapeutic modality in cancer treatment, physically interfere with cell division.
Methods: Phase III trial of chemotherapy-free treatment of NovoTTF (20–24 h/day) versus active chemotherapy in the treatment of patients with recurrent glioblastoma. Primary endpoint was improvement of overall survival.
Results: Patients (median age 54 years (range 23–80), Karnofsky performance status 80% (range 50–100) were randomised to TTF alone ($n = 120$) or active chemotherapy control ($n = 117$). Number of prior treatments was two (range 1–6). Median survival was 6.6 versus 6.0 months (hazard ratio 0.86 [95% CI 0.66–1.12]; $p = 0.27$), 1-year survival rate was 20% and 20%, progression-free survival rate at 6 months was 21.4% and 15.1% ($p = 0.13$), respectively in TTF and active control patients. Responses were more common in the TTF arm (14% versus 9.6%, $p = 0.19$). The TTF-related adverse events were mild (14%) to moderate (2%) skin rash beneath the transducer arrays. Severe adverse events occurred in 6% and 16% ($p = 0.022$) of patients treated with TTF and chemotherapy, respectively. Quality of life analyses favoured TTF therapy in most domains.
Conclusions: This is the first controlled trial evaluating an entirely novel cancer treatment modality delivering electric fields rather than chemotherapy. No improvement in overall survival was demonstrated, however efficacy and activity with this chemotherapy-free treatment device appears comparable to chemotherapy regimens that are commonly used for recurrent glioblastoma. Toxicity and quality of life clearly favoured TTF.

1. Background

Glioblastoma is the most prevalent primary malignant brain tumour in adults. Median survival with optimal therapy is only 15 months from diagnosis, and most tumours recur within 9 months of initial treatment.[1] At the time of disease recurrence, treatment options for glioblastoma patients are limited. Repeat surgery may be considered in approximately 20% of patients,[2–4] and re-irradiation is possible in rare circumstances. For most patients chemotherapy is indicated at disease recurrence, with the choice of drug varying greatly. In the United States, bevacizumab has been provisionally approved for recurrent glioblastoma, while the European Medicines Agency (EMEA) rejected the application in the absence of a controlled trial.[5,6] Cytotoxic agents most frequently used are alkylating agents like nitrosoureas (e.g. lomustine [CCNU] or carmustine [BCNU],[7] procarbazine[8] or re-treatment with temozolomide.[9,10] Response rates are below 10%, progression-free survival rates at 6 months <20%.[7,8] In the absence of an established and satisfactory standard treatment, bevacizumab alone and in combination with irinotecan and experimental treatments are commonly used.[11–13]

Overall survival (OS) from recurrence is commonly short and without effective therapy rarely exceeds 3–5 months.[14–19] In a randomised trial of repeat surgery with implantation of carmustine wafers versus placebo median survival was 6.5 versus 4.7 months.[20] With active therapy, a median survival of 7 months (range 5–9.2 months)[7–10,12,13,21–24] has been reported. A recent randomised comparison of enzastaurin versus lomustine at first recurrence demonstrated a median survival of 7.1 months, with 19% of patients alive and progression-free at 6 months when treated with lomustine.[7] Based on these results active chemotherapy as salvage treatment for patients with recurrent glioma is recommended, which strives to improve survival and quality of life despite inherent chemotherapy-related toxicity.

The NovoTTF-100A system (Novocure Ltd., Haifa, Israel) is a portable device delivering low intensity, intermediate frequency, alternating electric fields (Tumour Treating Fields; TTF) using non-invasive, disposable transducer arrays (Fig. 1A). These fields physically

Medical Policy

Subject:	Electric Tumor Treatment Field (TTF)		
Policy #:	DME.00035	**Current Effective Date:**	01/01/2014
Status:	Reviewed	**Last Review Date:**	11/14/2013

Description/Scope

Electrical fields known as "tumor treatment fields (TTF)" are created by low-intensity, intermediate frequency (100 – 200 kilohertz [kHz]) electric currents delivered to the malignant tumor site by insulated electrodes placed on the skin surface. TTF is felt to cause tumor cell death (apoptosis) by disrupting the assembly of microtubules during later stages of cell division.

Position Statement

Investigational and Not Medically Necessary:

The use of devices to generate electric tumor treating fields (TTF) as a treatment for malignant tumors is considered **investigational and not medically necessary.**

Rationale

The use of electric fields and the corresponding effects upon living tissue has been studied in the laboratory and clinical settings. Alternating electric fields at very low frequencies (below 1 kHz) stimulate excitable tissue resulting from membrane depolarization (Kirson 2004, 2007, 2009; Salzberg, 2008). Electric fields in the tens of kHz to megahertz (intermediate-frequency) alternate too fast to stimulate tissue and results in minute heating. Kirson and colleagues (2004) demonstrated targeted inhibitory effects on dividing cells with the application of alternating electric fields of very low-intensity (less than 2 V/centimeter [cm]) and intermediate-frequency, called TTF. Utilizing time-lapse microphotography of mouse melanoma cell cultures, unique cellular processes as a result of TTF exposure were identified. Prolongation of mitosis in TTF-treated cells was statistically significant, and one quarter of the treated cells was destroyed. Cellular destruction was observed only in mitotic cells, and cells at rest (quiescent) remained intact, both functionally and morphologically. Nuclear rotation was also observed in TTF treated cell cultures. Microtubules, in the form of spatially organized mitotic spindles in dividing cells, have very large electric dipole moments that may be disoriented by TTF forces. In the control cell cultures, 95% of the mitotic spindles were intact and exhibited normal features in cells undergoing mitosis compared to 50% of abnormal cell activity in TTF-treated cultures. The use of TTF was then applied in vivo, to two animal tumor models (adenocarcinoma and malignant melanoma cells). TTF-treated tumors were significantly smaller compared to the control tumor size, and the surrounding normal tissue was spared from injury. The encouraging preclinical data led to studies of electric TTF treatment in humans based on the principle that TTF results in disruption of the cell membrane and programmed cell death of cancer cells.

Glioblastoma Multiforme (GBM)

In an industry-sponsored study, Kirson and colleagues (2007) reported results of TTF treatment on various tumor cell lines and animal tumor models and noted "Optimal frequencies differed between cancer cell types." Additionally, the effects of a total of 280 weeks of TTF treatment on 10 individuals with recurrent GBM were reported in the pilot study. TTF treatment resulted in a median time to progression (TTP) of 26.1 weeks (range 3 – 124 weeks) and the progression free survival at 6 months (PFS6) of 50% (23 -77% confidence interval [CI]). The median overall survival (OS) was 62.2 weeks (range 20.3 - 124.0 weeks). One individual achieved a complete response (CR) and is free from tumor ten months after stopping treatment, and one participant achieved and continues to maintain a partial response (PR) seven months after stopping treatment. The authors concluded TTF treatment is encouraging when compared to historical average PFS6 of 15.3 ± 3.8% and average historical TTP of 9.5 ± 1.6 weeks and an average OS 29.3 ± 6 weeks. Mild to moderate contact dermatitis was reported in nine out of ten participants.

The U.S. Food and Drug Administration (FDA) approved the premarket approval application (PMA) for NovoTTF™-100A System (NovoCure™ Ltd., Portsmouth, NH; Haifa, Israel) in 2011. The approved indication for NovoTTF is as a treatment for adults with histologically-confirmed, recurrent GBM in the supratentorial region of the brain after receiving chemotherapy. The label (2011) states "The device is intended to be used as monotherapy, and is intended as an alternative to standard medical therapy for GBM after surgical and radiation options have been exhausted."

The PMA was based on data presented to the committee from a phase III, multinational, randomized, controlled pivotal clinical trial. Between September 2006 and May 2009, 28 clinical centers enrolled 237 adult participants with relapsed or progressive GBM despite conventional therapy (e.g., surgery and chemo-radiotherapy followed by chemotherapy) (Stupp, 2012). One hundred twenty participants were randomized in a 1:1 ratio to receive monotherapy with NovoTTF treatment and 117 participants were randomized to the group treated with available best standard care (BSC) chemotherapies as practiced at each of the participating clinical centers. Chemotherapy agents considered as BSC during the trial included platinum-based chemotherapy (i.e., carboplatin); nitrosureas (BCNU); procarbazine; combination of procarbazine, lomustine and vincristine (PCV); temozolomide; and bevacizumab. A period of twenty-eight-days of treatment with NovoTTF was considered one full treatment course. Participants treated with NovoTTF were allowed to take breaks from treatment up to an hour, twice per day for personal needs such as showers. The primary endpoint of the study was OS. Secondary endpoints included PFS6, TTP, 1-year survival rate, quality of life (QOL), and radiological response. Participants were seen in clinic monthly, and magnetic resonance imaging (MRI) was performed after 2, 4 and 6 months from initiation of treatment and subsequent MRIs were done according to local practice until disease progression. Medical follow-up continued for 2 months after disease progression. Monthly telephone interviews with the participants' caregivers were used to assess participant mortality rates.

Of the 237 enrollees, 8 participants (4 in each group) did not receive the assigned therapy. Ninety-seven percent (116) of 120 enrollees in the NovoTTF group started treatment and 93 participants (78%) completed one cycle (4 weeks) of therapy. Discontinuation of TTF occurred in 27 participants due to noncompliance or the inability to handle the device. For each TTF treatment month, the median compliance was 86% (range 41-98%), which equaled a mean use of 20.6 hours per day. In the BSC (active control) group, 113 (97%) of the 117 assigned participants received chemotherapy and all completed one full treatment course with the exception of one individual. In the BSC cohort, 21 participants did not return to the site and details on disease progression and toxicity were not available. Stupp and colleagues (2012) noted the median survival of 6.6 months in the TTF group was marginally higher than 6 months in the BSC group (hazard ratio 0.86 [95%

CI 0.66 – 1.12]; p=0.27). For both groups, one-year survival was 20%. The survival rates for 2- and 3-years were 8% (95% CI 4, 13) and 4% (95% CI 1, 8) versus 5% (95% CI 3, 10) and 1% (95% CI 0, 3) for the TTF cohort compared to the BSC cohort, respectively. With a median follow-up of 39 months, 93% (220 participants) had died. Objective radiological responses (partial and complete response) were noted in 14 participants in the TTF group and 7 in the BSC group, with a calculated response rate of 14.0% (95% CI 7.9- 22.4%) compared to 9.6% (95% CI 3.9 – 18.8%), respectively. Sixteen percent of the TTF participants had grade 1 and 2 contact dermatitis on the scalp, which resolved with topical steroids. BSC participants experienced grade 2-4 events by organ system related to the pharmacologic activity of chemotherapy agents utilized. Quality of life data were available in 63 participants (27%). Based on the QLQ C-30 and BN-20 questionnaires, 5 out of 6 general scales and 7 of 9 symptom scales including nausea, vomiting, diarrhea, constipation and pain, quality of life was consistently higher in NovoTTF than in the control group. There were no meaningful differences observed between the domains of global health and social functioning. The BSC cohort had a larger decrease in the negative effects of seizures than the TTF cohort. The self-reporting of QOL indicators may be influenced by bias for the treatment group (FDA Label, 2011; Stupp, 2012).

Results from an industry sponsored pilot study of TTF alone and TTF in combination with chemotherapy for individuals with diagnosed GBM were reported (Kirson, 2009b). In this single arm study, the first group included 10 individuals with recurrent GBM after failure of maintenance temozolomide and 10 individuals with newly diagnosed GBM treated with TTF combined with temozolomide were in the second cohort. All 20 individuals were treated for an average of 1 year (range 2.5 – 24 months) continuously. The first group was compared to a matched group of 18 concurrent controls who received salvage chemotherapy for relapsed/recurrent GBM. The TTF-chemotherapy group was compared to a matched group of 32 concurrent controls who received temozolomide alone. In addition, OS for both cohorts was compared to matched historical control data. Data for the first group were reported in 2007 (Kirson). For the group of 10 individuals with newly diagnosed GBM, PFS was significantly different (P=0.0002, HR 3.32 [95% CI 1.9 – 5.9]) between the TTF-chemotherapy group compared to the matched concurrent and historical controls. The difference in OS was also significant (P=0.0018). The authors concluded TTF may also be an effective sensitizer when used concurrently with chemotherapeutic agents. However, the results were compared to historical data and need to be confirmed in prospective trials.

Although the NovoTTF-100A device has received FDA approval, the pivotal trial did not achieve the primary endpoint of the study, which was improved survival with NovoTTF treatment in comparison to chemotherapy. In addition, the long-term safety and efficacy as a treatment for recurrent GBM has not been demonstrated. The expedited premarket approval (PMA) included a requirement for a post-market non-randomized, unblinded, concurrent control study of NovoTTF-100A in individuals with recurrent GBM. The primary question to be addressed by the study (FDA Label, 2011): "Is the overall survival of patients treated with NovoTTF-100A non-inferior to the survival of patients treated with the best standard of care (chemotherapy)." There are currently ongoing clinical trials investigating the safety and effectiveness of the novel TTF device. In addition, there are ongoing investigations to determine the optimal TTF dosing for specific tumor types; the use of TTF alone and in combination with chemotherapy agents; and its place in therapy. Currently, most of the published articles include animal studies, in vitro studies and small case series.

Treatment recommendations published by the National Comprehensive Cancer Network® (NCCN, 2013) and the National Cancer Institute (NCI, 2013) include surgical resection, radiation therapy

and/or chemotherapy as treatment options. In January 2013, the NCCN clinical practice guideline for CNS Tumors was updated to include a consideration for alternating electric field therapy for individuals with recurrent, diffuse or multiple GBM as a category 2B level of evidence. The NCI Adult Brain Tumors Treatment (PDQ®) (2013) does not include TTF treatment for recurrent GBM.

Currently, there are phase II and III trials recruiting participants with GBM to treatment with NovoTTF-100A and other agents to evaluate the effect on progression-free survival, objective response rate and overall survival. Similarly, a phase II trial is studying the effect of NovoTTF-100A after stereotactic radio-surgery (SRS) to treat individuals with brain metastases from non-small cell lung cancer. The studies are expected to be completed in 2015.

Other Solid Tumors

In addition to TTF treatment for brain tumors, this novel therapy has been studied in other types of malignancies. A pilot study (Salzberg, 2008) included six participants with locally advanced or metastatic malignant tumors (3 cases - skin metastasis from primary breast cancer; 1 case each: GBM, malignant melanoma, mesothelioma). Participants had no concomitant anti-tumor therapy and had no additional standard therapy available. All six participants had a total of 128 full days of TTF treatment with individual exposure of 13 – 46 days. Compliance was greater than 80%. Three out of six participants had grade 1 skin irritation which was reversible with electrode repositioning and application of topical steroid ointments. A partial response in skin metastasis from primary breast cancer was observed in one participant. Tumor growth was arrested in three participants and one participant had progressive disease. The participant with mesothelioma had stabilization of a portion of the tumor while another part of the tumor had progressive disease. The individual with GBM did not respond to 4 weeks of treatment. The mixed results and minimal toxicities from TTF warranted "further investigation in larger clinical trials."

A phase I/II trial investigating the use of NovoTTF-100L device in combination with pemetrexed as a treatment for individuals with advanced non-small cell lung cancer (NSCLC) has been completed. However, a future phase III trial has been planned to confirm the results of the initial studies and to further investigate the application of electric TTF as a treatment for progressive NSCLC.

The NCCN clinical practice guideline for NSCLC (2013) and the 2013 NCI NSCLC Treatment PDQ do not include the use of electric TTF treatment.

Background/Overview

The NovoTTF-100A System was approved by the U.S. Food and Drug Administration in April 2011, as a novel device to treat adults with glioblastoma multiforme (GBM) that recurs or progresses after receiving chemotherapy and radiation therapy. TTF technology is also being studied as a treatment for other solid tumors such as non-small cell lung cancer and melanoma. There are published data from TTF use to treat tumors in pre-clinical trials and from small case series. However, there is a paucity of published evidence from randomized controlled trials comparing the long term safety and efficacy of TTF as a treatment of tumors.

According to the National Cancer Institute (2013), glioblastoma (World Health Organization grade IV) is also known as glioblastoma multiforme (GBM). The peak incidence for GBM occurs between the ages of 45 and 70 years. Glioblastoma is highly invasive and is the most frequently occurring brain tumor accounting for approximately 12% to 15% of all brain tumors and 50% to

60% of all astrocytic tumors. Giant cell glioblastoma and gliosarcoma are two histologic variants of glioblastoma multiforme. According to the NCCN (2013) GBM is the "deadliest brain tumor with only a third of patients surviving for one year and less than 5% living beyond 5 years." Anaplastic astrocytomas have a 5-year survival rate of 27%.

Definitions

Cytokinesis: The cytoplasmic changes accompanying mitosis. The cleavage of the cytoplasm into daughter cells following nuclear division.

Glioblastoma multiforme: Stage IV glioblastoma, which includes World Health Organization [WHO] recognized variants, giant cell glioblastoma and gliosarcoma.

Mitosis: The process by which a single parent cell divides to make two new daughter cells. Each daughter cell receives a complete set of chromosomes from the parent cell, allowing the body to grow and replace cells.

Progressive disease: Disease that is growing, spreading or getting worse.

Recurrent disease: Disease that has recurred (come back), usually after a period of time during which the disease could not be detected. In the case of cancer, the disease may come back to the same place as the original (primary) tumor or to another place in the body. Also called recurrence.

Coding

The following codes for treatments and procedures applicable to this document are included below for informational purposes. Inclusion or exclusion of a procedure, diagnosis or device code(s) does not constitute or imply member coverage or provider reimbursement policy. Please refer to the member's contract benefits in effect at the time of service to determine coverage or non-coverage of these services as it applies to an individual member.

When services are Investigational and Not Medically Necessary:

When the code describes a procedure indicated in the Position Statement section as investigational and not medically necessary.

HCPCS

A4555	Electrode/transducer for use with electrical stimulation device used for cancer treatment, replacement only
E0766	Electrical stimulation device used for cancer treatment, includes all accessories, any type

ICD-9 Diagnosis ***[For dates of service prior to 10/01/2014]***
All diagnoses

ICD-10 Diagnosis ***[For dates of service on or after 10/01/2014]***
All diagnoses

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Government Agency, Medical Society, and Other Authoritative Publications:

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    - Pancreatic Adenocarcinoma (V.1.2013). April 9, 2013.
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Web Sites for Additional Information

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2. National Cancer Institute (NCI). Available at: http://www.cancer.gov/. Accessed on August 12, 2013.
3. National Institutes of Health. ClinicalTrials.gov. Available at: http://clinicaltrials.gov/. Accessed on August 12, 2013.

Index

The use of specific product names is illustrative only. It is not intended to be a recommendation of one product over another, and is not intended to represent a complete listing of all products available.

Document History

Status	Date	Action
Reviewed	11/14/2013	Medical Policy & Technology Assessment Committee (MPTAC) review.
Reviewed	11/13/2013	Hematology/Oncology Subcommittee review. Updated Rationale, Referer and Websites. Updated Coding section with 01/01/2014 HCPCS changes.
Reviewed	11/08/2012	MPTAC review.
Reviewed	11/07/2012	Hematology/Oncology Subcommittee review. Updated Rationale, Referer and Websites.
Reviewed	11/17/2011	MPTAC review.
Reviewed	11/16/2011	Hematology/Oncology Subcommittee review. Updated References and Websites.
New	08/18/2011	MPTAC review. Initial document development.

Clinical Policy Bulletin:
Electric Tumor Treatment Fields
Number: 0827

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Policy

Aetna considers devices to generate electric tumor treatment fields (ETTF) medically necessary as monotherapy for persons with histologically confirmed glioblastoma (World Health Organization grade IV astrocytoma), after histologically or radiologically confirmed recurrence in the supratentorial region of the brain after receiving chemotherapy.

Aetna considers devices to generate ETTF experimental and investigational for the treatment of other malignant tumors (e.g., breast, lung, melanoma, ovarian cancer, pancreatic cancer, and solid tumor brain metastases; not an all-inclusive list) and all other indications because their effectiveness has not been established.

Background

Alternating electric fields, generated by insulated electrodes, have been reported to exhibit inhibitory effect on the growth rate of a variety of human and rodent tumor cell lines as well as malignant tumors in animals. This non-thermal effect selectively affects dividing cells while quiescent cells are left intact. There are 2 modes of action for these anti-tumoric effects: (i) arrest of cell proliferation, and (ii) destruction of cells while undergoing division. Both effects were observed when such fields were applied for 24 hours to cells undergoing mitosis that is oriented along the field direction. The 1st mode of action is manifested by interference with the proper formation of the mitotic spindle, while the 2nd mode of action results in rapid disintegration of the dividing cells. Both effects are consistent with the computed directional forces exerted by these specific fields on charges and dipoles within the dividing cells. In-vivo treatment of tumors in C57BL/6 and BALB/c mice resulted in significant slowing of tumor growth and extensive destruction of tumor cells within 3 to 6 days. These findings showed the potential applicability of alternating electric fields as a novel therapeutic modality for malignant tumors (Kirson et al, 2004).

Electric tumor treating fields (ETTF), also known as alternating electrical field therapy, are low-intensity (1 to 2 V/cm), intermediate-frequency (100 to 200 kHz), alternating electric fields employed for the treatment of malignant tumors. This novel treatment modality has shown promise in pilot clinical trials in patients with advanced stage solid tumors including glioblastoma (GBM). Current published evidence is primarily from a single investigator group.

Kirson et al (2007) reported the findings of a pilot clinical trial examining the effects of ETTF in 10 patients with recurrent GBM. Median time to progression (TTP) in these patients was 26.1 weeks and median overall survival (OS) was 62.2 weeks. The authors noted that these TTP and OS values were more than double the reported medians of historical control patients. No device-related serious adverse events (AEs) were seen after more than 70 months of cumulative treatment in all of the patients. The only device-related AE observed was a mild-to-moderate contact dermatitis beneath the field delivering electrodes. The authors concluded that ETTF are a safe and effective new treatment modality that effectively slows down tumor growth in-vitro, in-vivo, as well as in human cancer patients.

In a pilot study, Salzberg and colleagues (2008) evaluated the safety, tolerability, and effectiveness of ETTF treatment in patients with locally advanced or metastatic solid tumors using the NovoTTF-100A device. A total of 6 patients were heavily pre-treated with several lines of therapy; no additional standard treatment option was available to them. Electric tumor treating fields treatment using continuous NovoTTF-100A lasted a minimum of 14 days and was well-tolerated. No related serious AEs occurred. Outcomes showed 1 partial response of a treated skin metastasis from a primary breast cancer, 3 cases where tumor growth was arrested during treatment, and 1 case of disease progression. One mesothelioma patient experienced lesion regression near ETTF with simultaneous tumor stability or progression in distal areas. The authors concluded that although the number of patients in this study was small, the lack of therapy toxicity and the effectiveness observed in data gathered to date indicate the potential of ETTF as a new treatment modality for solid tumors, thus, warranting further investigation.

Kirson et al (2009) reported the findings of 20 GBM patients who were treated with ETTF for a median duration of 1 year. No ETTF-related systemic toxicity was observed in any of these patients, nor was an increase in temozolomide toxicity seen in patients receiving combined treatment. In newly diagnosed GBM patients, combining ETTF with temozolomide treatment led to a progression-free survival of 155 weeks and OS of 39+ months. The authors concluded that these results suggest that combining ETTF with chemotherapeutic cancer treatment may increase chemotherapeutic efficacy and sensitivity without increasing treatment related toxicity.

Recent reviews indicated the ETTF is a promising approach for the treatment of GBM and non-small cell lung cancer. Stupp and Weller (2010) noted that novel treatment approaches in recurrent GBM include anti-angiogenic agents (e.g., bevacizumab and cilengitide) as well as ETTF (NovoTTF). Furthermore, Pless and Weinberg (2011) reviewed in-vitro and in-vivo pre-clinical studies, showing the activity of ETTF both as a monotherapy as well as in combination with several cytotoxic agents. They also summarized the clinical experience with ETTF, mainly in 2 indications: (i) recurrent GBM: in a prospective randomized phase III trial, ETTF was compared with best standard care (BSC, including chemotherapy): ETTF significantly improved median OS compared

with standard therapy (7.8 versus 6.1 months) for the patients treated per protocol (Stupp et al, 2010; published as an abstract). Importantly, quality-of-life was also better in the ETTF group (Ram et al, 2010); (ii) a phase II study of second-line treatment of non-small cell lung cancer, where ETTF was administered concomitantly with pemetrexed. This combination resulted in an excellent median OS of 13.8 months (Pless et al, 2010; published as an abstract). Interestingly, the progression-free survival (PFS) within the area of the ETTF was 28 weeks; however, outside the ETTF the PFS was only 22 weeks. This is an important finding because it can be assumed that in the same patient the higher tumor control within the TTFields area was a specific effect of TTFields. Median OS was 13.8 months and 1-year survival was 57 %; 6 patients (14.6 %) had a radiological partial remission and 16 patients had stable disease (39 %). The authors stated that these results are promising and compare well with matched historical controls treated with pemetrexed alone in second--line treatment. The authors stated that the proof of concept of ETTF has been demonstrated in the pre-clinical setting, and the clinical data seem promising in various tumor types. The side effects of ETTF were minimal and in general consisted of skin reaction to the electrodes. The authors said that there are are a number of ways in which ETTF could be further evaluated, for example, in combination with chemotherapy, as a maintenance treatment, or as a salvage therapy if radiotherapy or surgery is not possible. The authors concluded that while more clinical data are clearly needed, ETTF is an emerging and promising novel treatment concept (Pless and Weinberg, 2011).

On April 15, 2011, the Food and Drug Administration (FDA) approved the NovoTTF-100A System (Novocure, Portsmouth, NH) for the treatment of adults with GBM that recurs or progresses after receiving chemotherapy and radiation therapy. The NovoTTF-100A System is not intended to be used in combination with other cancer treatment. It should only be used after other treatments have failed. The FDA-approved indication for use is: "The NovoTTF-100A System is intended as treatment for adult patients (22 years of age or older) with histologically confirmed glioblastoma multiforme (GBM), following histologically or radiologically confired recurrence in the supra-tentorial region of the brain after receiving chemotherapy. The device is intended to be used as a monotherapy, and is intended as an alternative to standard medical therapy for GBM after surgical and radiation options have been exhausted."

The approval was based on data presented to the FDA from a multi-national, randomized, controlled study. The expedited pre-market approval (PMA) includes a requirement for a post-market non-randomized, unblinded, concurrent control study of NovoTTF-100A in patients with recurrent GBM. The primary question to be addressed by the study (FDA, 2011): "Is the overall survival of patients treated with NovoTTF-100A non-inferior to the survival of patients treated with the best standard of care (chemotherapy)"?

The first randomized clinical study of electric tumor treatment fields did not reach its primary end-point of improved survival compared to active chemotherapy (Stupp, et al., 2012; Novocure, 2012). This study was funded and sponsored by the device manufacturer, Novocure, Ltd. Subjects for this study were age 18 years or older with histologically confirmed glioblastoma (World Health Organization grade IV astrocytoma) with radiologically confirmed disease progression. Patients had a Karnofsky performance status greater than or equal to 70 percent, and adequate hematologic, renal and hepatic function (absolute neutrophil count greater than or equal to 1000/mm3, hemoglobin greater than or equal to 100g/L, platelet count greater than or equal to

100,000/mm3, serum creatinine level less than or equal to 1.7 mg/dL, total serum bilirubin less than or equal to the upper limit of normal, and liver function values less than three times the upper limit of normal. Prior therapy must have included radiotherapy (with and without concomitant and/or adjuvant temozolomide). Patients with infra-tentorial tumor location were excluded, as were patients with implanted electronic medical devices (e.g. pacemaker, programmable ventriculo-peritoneal shunt). Patients were randomized in a 1:1 ratio to receive either NovoTTF-100A without chemotherapy or the physician's choice of active chemotherapy (active control). Chemotherapy agents considered as best standard of care (BSC) during the study included platinum-based chemotherapy (i.e., carboplatin); nitrosureas; procarbazine; combination of procarbazine, lomustine and vincristine; temozolomide; and bevacizumab. For patients assigned to Novo-TTF, uninterrupted treatment was recommended, although patients were allowed to take treatment breaks of up to an hour, twice per day, for personal needs (e.g. shower). In addition, patients assigned to Novo-TTF were allowed to take 2–3 days off treatement at the end of each of 4 week (which is the minimal required treatment duration for TTF therapy to reverse tumor growth) . A period of 28 days of treatment with ETTF was considered 1 full treatment course. The primary end point of the study was overall survival. Secondary end points included progression free survival rates at 6-months; median time to progression (TTP), 1-year survival rate; quality-of-life; and radiological response. Subjects were seen in clinic monthly, and magnetic resonance imaging (MRI) was performed after 2, 4 and 6 months from initiation of treatment and subsequent MRIs were done according to local practice until disease progression. Medical follow-up continued for 2 months after disease progression. Monthly telephone interviews with the subjects' caregivers were used to evaluate subject mortality rates.

A total of 28 clinical centers enrolled 237 adult subjects with 120 subjects randomized to the NovoTTF treatment group and 117 subjects randomized to the BSC group (Stupp, et al., 2012; Novocure, 2012). A total of 30 subjects never started on trial (4 in the treatment group and 26 in the BSC group); 207 subjects started on trial, with 79 % discontinuation rate (n = 47 deaths; n = 49 deterioration of condition; and n = 68 study requirements of 2 additional clinic visits after disease progression were completed). Consent was withdrawn before completing 2 months of post-progression follow-up in 20 subjects. Adverse events led to 20 additional subject withdrawals. Non-compliance with follow-up was attributed to 3 subjects. The proportions were similar between the NovoTTF-100A group and the BSC group of subjects who did not complete the protocol-defined follow-up due to withdrawal of consent, non-compliance, or AEs. An average of 4.2 months of TTF treatment per subject was completed for the 116 subjects in the active treatment cohort. Complete vital statistics were known for 93 % (221 subjects) at the end of the study. There were 202 known deaths and 19 subjects (ETTF = 9; BSC = 10) were still alive 6 months after the last subject was randomized. Sixteen (7 %) subjects were lost to follow-up.

The trial did not reach its primary end-point of improved survival compared to active chemotherapy (Stupp, et al., 20112; Novocure, 2012). In addition, differences in response rates, progression-free survival at 6 months, and reduction in risk of death were not statistically significant. Quality of life analyses favored ETTF therapy in most domains. The differences in median overall survival between patients in the NovoTTF-100A group and the BSC group were not statistically significant. According to the FDA, the median OS is 6.3 months (95 % confidence interval [CI]: 5.6 to 7.8) in the NovoTTF-100A group

and 6.4 months (95 % CI: 5.2 to 7.4) in the BSC group (log rank p = 0.98; Wilcoxon p = 0.72). The hazard ratio is 1.0 (95 % CI: 0.76 to 1.32) (test for proportional hazards p = 0.45). In the active chemotherapy control arm of the trial, survival was not significantly affected by the choice of chemotherapy. The Kaplan-Meier survival curve for the two treatment groups appeared to be very similar during the first 12 months of followup. Between 12 and 24 months, the survival curves separated slightly in favor or the BSC control group. There were no statistically significant differences in secondary endpoints of one-year survival, progression-free survival, radiologic response rates, and median time to tumor progression (TTP). Mild to moderate (grade 1 and 2) contact dermatitis on the scalp beneath the transducer arrays occurred in 16% of ETTF patients. Patients receiving active control chemotherapy experienced toxicity related to pharmacologic mechanism of the agents used: gastrointestinal (30% vs. 8%), hematological (19% vs. 4%) and infectious (12% vs. 4%). Longitudinal Quality of Life (QOL) was available in only 27 percent of subjects (63 patients) who remained on study therapy for three months and for whom QOL data were available. In the domains of global health and social functioning, no meaningful differences between chemotherapy and ETTF were observed. However, cognitive, emotional, and role functioning favored ETTF, whereas physical functioning favored chemotherapy. Symptom scale analysis is in accordance to treatment-associated toxicity; appetite loss, diarrhea, constipation, nausea and vomiting were directly related to the chemotherapy administration. Increased pain and fatigue was reported in the chemotherapy-treated patients and not in the ETTF treatment group.

Commenting on the trial by Stupp, et al., Debonis, et al. (2012) stated that the study was designed for superiority; although well conducted, it might not have shown it for a limited compliance in the ETTF group. Debonis, et al. (2012) stated that, even with this limitation, the trial by Stupp, et al. has shown at least equivalence of ETTF to chemotherapy, with a decreased toxicity and increased quality of life favoring ETTF.

The manufacturer has initiated a subsequent randomized clinical trial enrolling newly diagnosed glioblastoma patients after completion of standard radiochemotherpy, parallel to starting the adjuvant or maintenance temozolomide chemotherapy (Stupp, et. al., 2012). Patients randomized to the experimental arm will receive ETTF in addition to maintenance temozolomide.

The National Comprehensive Cancer Network (NCCN, 2013) has a Category 2B recommendation to consider the use of ETTF for persons with local, diffuse or multiple recurrences of glioblastoma.

Electric tumor treating fields technology is also being studied as a treatment for other solid tumors (e.g., melanoma and non-small cell lung cancer). However, there is a paucity of published evidence from randomized controlled trials examining the long-term safety and effectiveness of ETTF as a treatment of tumors.

Davis et al (2013) stated that the anti-mitotic effect of tumor treating fields (TTFields) therapy has been demonstrated in multiple cell lines when the appropriate frequency was utilized. A phase III trial of TTFields monotherapy compared to active chemotherapy in recurrent glioblastoma patients established that TTFields therapy is associated with minimal toxicity, better quality of life, and comparable efficacy to chemotherapy. Ongoing and future trials will evaluate TTFields in newly diagnosed glioblastoma, solid tumor brain metastases, non-small cell lung cancer, and ovarian and pancreatic cancers.

CPT Codes / HCPCS Codes / ICD-9 Codes

ICD-9 codes covered if selection criteria are met:

191.0 - 191.9	Malignant neoplasm of brain [World Health Organization grade IV astrocytomas]

No specific code for ETTF :

ICD-9 codes not covered for indications listed in the CPB:

147.0 - 147.9	Malignant neoplasm of nasopharynx
150.0 - 150.9	Malignant neoplasm of esophagus
151.0 - 151.9	Malignant neoplasm of stomach
153.0 - 153.9	Malignant neoplasm of colon
154.0 - 154.8	Malignant neoplasm of rectum, rectosigmoid junction, and anus
155.1	Malignant neoplasm of intrahepatic bile duct
156.0 - 156.9	Malignant neoplasm of gall bladder and extrahepatic bile duct
157.0 - 157.9	Malignant neoplasm of pancreas
160.2 - 160.9	Malignant neoplasm of accessory sinuses (paranasal)
162.0 - 162.9	Malignant neoplasm trachea, bronchus, and lung
164.0	Malignant neoplasm of thymus
171.0 - 171.9	Malignant neoplasm of connective and other soft tissue
172.0 - 172.9	Malignant neoplasm of skin
174.0 - 174.9	Malignant neoplasm of female breast
175.0 - 175.9	Malignant neoplasm of male breast
176.1	Kaposi's sarcoma, soft tissue
180.0 - 180.9	Malignant neoplasm of cervix uteri
182.0 - 182.8	Malignant neoplasm of body of uterus
183.0	Malignant neoplasm of ovary
183.2	Malignant neoplasm of fallopian tube
185	Malignant neoplasm of prostate
189.0 - 189.9	Malignant neoplasm of kidney and other and unspecified urinary organs
193	Malignant neoplasm of thyroid gland
198.3	Secondary malignant neoplasm of brain and spinal cord
230.0 - 234.9	Carcinoma in situ

The above policy is based on the following references:

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7. Ram Z, Gutin PH, Stupp R. Subgroup and quality of life analyses of the phase III clinical trial of NovoTTFields-100A versus best standard chemotherapy for recurrent glioblastoma. Neuro Oncol. 2010;12(Suppl 4):iv36-iv57.
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9. Pless M, Weinberg U. Tumor treating fields: Concept, evidence and future. Expert Opin Investig Drugs. 2011;20(8):1099-106.
10. U.S. Food and Drug Administration (FDA). Tumor treatment fields. NovoTTF-10A System. Summary of safety and effectiveness data (SSED). Premarket Approval Application (PMA) No. P100034. Premarket Notification Database. Rockville, MD: FDA; April 8, 2011. Available at: http://www.accessdata.fda.gov/cdrh_docs/pdf10/P100034b.pdf. Accessed November 18, 2011.
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12. National Cancer Institute (NCI). Adult brain tumors treatment (PDQ). Health Professional Version. Bethesda, MD: NCI; updated July 9, 2012.
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16. Novocure (USA) Inc. NovoTTF-100A System. Instructions for Use. Document number QSD-QR-330. P/N 4CG-113281 REV04. Portsmouth, NH: Novocure; issued March 3, 2012.
17. National Comprehensive Cancer Network (NCCN). Central nervous system cancers. Version 1.2013. NCCN Clinical Practice Guidelines in Oncology. Fort Washington, PA: NCCN; 2013.
18. Pless M, Droege C, von Moos R, et al. A phase I/II trial of Tumor Treating Fields (TTFields) therapy in combination with pemetrexed for advanced non-small cell lung cancer. Lung Cancer. 2013;81(3):445-450.
19. Davies AM, Weinberg U, Palti Y. Tumor treating fields: A new frontier in cancer therapy. Ann N Y Acad Sci. 2013;1291:86-95.

Electroconvulsive therapy (ECT) for depression

Question: For what conditions should electroconvulsive therapy (ECT) be a covered therapy? Should limitations be placed on the length of treatment?

Question source: OHP Medical Directors and DMAP Mental Health Division

Issue: ECT (CPT 90870) is currently on lines 7 MAJOR DEPRESSION, RECURRENT; MAJOR DEPRESSION, SINGLE EPISODE, SEVERE and 29 BIPOLAR DISORDERS. Guideline Note 102 addresses the use of ECT for treatment of depression. There is no guideline addressing its use in bipolar disorder. The OHP medical directors and the mental health division have asked HERC for guidance on the indications and length of therapy for ECT.

GUIDELINE NOTE 102, NON-PHARMACOLOGIC INTERVENTIONS FOR TREATMENT-RESISTANT DEPRESSION

Line 7

Repetitive transcranial magnetic stimulation (CPT 90867-90868) and electroconvulsive therapy (CPT 90870) are covered only after failure of at least two antidepressants.

Evidence

1) **NICE 2010**, guidance for the use of ECT
    a. It is recommended that electroconvulsive therapy (ECT) is used only to achieve rapid and short-term improvement of severe symptoms after an adequate trial of other treatment options has proven ineffective and/or when the condition is considered to be potentially life-threatening, in individuals with
        i. severe depressive illness
        ii. catatonia
        iii. a prolonged or severe manic episode.
    b. The decision as to whether ECT is clinically indicated should be based on a documented assessment of the risks and potential benefits to the individual, including: the risks associated with the anaesthetic; current co-morbidities; anticipated adverse events, particularly cognitive impairment; and the risks of not having treatment.
    c. Clinical status should be assessed following each ECT session and treatment should be stopped when a response has been achieved, or sooner if there is evidence of adverse effects. Cognitive function should be monitored on an ongoing basis
    d. It is recommended that a repeat course of ECT should be considered under the circumstances indicated in 1.1 only for individuals who have severe depressive illness, catatonia or mania and who have previously responded well to ECT. In patients who are experiencing an acute episode but have not previously

responded, a repeat trial of ECT should be undertaken only after all other options have been considered and following discussion of the risks and benefits with the individual and/or where appropriate their carer/advocate.

e. As the longer-term benefits and risks of ECT have not been clearly established, it is not recommended as a maintenance therapy in depressive illness.

Expert input

Laurence Colman, MD, MPH, Chief Medical Officer, Greater Oregon Behavioral Health

I think that [proposed] guideline note puts the indications and expectations of ECT treatment and monitoring very nicely and clearly.

The issue that came up with the Sacred Heart doc was his recommendation at the start of treatment for expected monthly maintenance ECT without any apparent regard to clinical improvement, so I appreciate that the guideline clearly sets the expectation that you STOP once the patient is responding.

In reviewing the literature myself and discussing best practices for the above case with one of the ECT practitioners at OHSU, it does sound like there's a very small minority of patients (1-3% of all those referred to this particular OHSU doc's treatment-resistant/ECT specialty clinic) for whom long-term maintenance ECT seems to be the only treatment with clinical benefit. I'm not sure how we'd handle an OHP patient meeting that criteria based on this guideline note, but clearly that's going to be a rarity.

HERC staff recommendation:

1) Modify GN102 as shown below

GUIDELINE NOTE 102, NON-PHARMACOLOGIC INTERVENTIONS FOR TREATMENT-RESISTANT DEPRESSION AND SEVERE MANIA

Line 7,29

Repetitive transcranial magnetic stimulation (CPT 90867-90868) and electroconvulsive therapy (ECT; CPT 90870) are covered only after failure of at least two antidepressants. ECT is covered for severe or prolonged manic episodes only after an adequate trial of other treatment options has proven ineffective and/or when the condition is considered to be potentially life-threatening. Clinical status should be assessed following each ECT session and treatment should be stopped when a response has been achieved, or sooner if there is evidence of adverse effects. A repeat course of ECT should be considered only for individuals who have severe depressive illness or mania and

who have previously responded well to ECT. ECT is not covered as a maintenance therapy in depressive illness.

NHS

National Institute for Clinical Excellence

Guidance on the use of electroconvulsive therapy

Update

May 2010

The guidance on the use of electroconvulsive therapy (ECT) for the treatment of depression has been updated by 'Depression: the treatment and management of depression in adults' (NICE clinical guideline 90).The advice on the use of ECT for the treatment of other disorders has not changed.

Technology Appraisal 59

April 2003

Technology Appraisal Guidance 59

Guidance on the use of electroconvulsive therapy

Issue date: April 2003
Review date: November 2005

To order copies
Copies of this guidance can be obtained from the NHS Response Line by telephoning 0870 1555 455 and quoting ref: N0205. A patient version of this document can be obtained by quoting ref: N0207. A bi-lingual patient leaflet is also available, ref: N0208.

This document has been circulated to the following:

- PCT Chief Executives
- NHS Trust Chief Executives in England and Wales
- Clinical Governance Leads in England & Wales
- Audit Leads in England & Wales
- Local Health Group General Managers
- Medical and Nursing Directors in England and Wales
- NHS Trust, PCT and LHG Libraries in England & Wales
- Consultant Psychiatrists in England and Wales
- Strategic Health Authority Chief Executives in England and Wales
- Directors of Directorates of Health and Social Care
- NHS Director Wales
- Chief Executive of the NHS in England
- NHS Executive Regional Directors
- Special Health Authority Chief Executives
- Community Health Councils in England and Wales
- Patient advocacy groups
- Commission for Health Improvement
- NHS Clinical Governance Support Team
- Chief Medical, Nursing Officers and Pharmaceutical Officers in England and Wales
- Medical Director & Head of NHS Quality – Welsh Assembly Government
- Representative bodies for health services, professional organisations and statutory bodies, Royal Colleges

This guidance is written in the following context:
This guidance represents the view of the Institute which was arrived at after careful consideration of the available evidence. Health professionals are expected to take it fully into account when exercising their clinical judgement. This guidance does not, however, override the individual responsibility of health professionals to make appropriate decisions in the circumstances of the individual patient, in consultation with the patient and/or guardian or carer.

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Contents

1 Guidance

1.1 It is recommended that electroconvulsive therapy (ECT) is used only to achieve rapid and short-term improvement of severe symptoms after an adequate trial of other treatment options has proven ineffective and/or when the condition is considered to be potentially life-threatening, in individuals with:

- severe depressive illness
- catatonia
- a prolonged or severe manic episode.

1.2 The decision as to whether ECT is clinically indicated should be based on a documented assessment of the risks and potential benefits to the individual, including: the risks associated with the anaesthetic; current co-morbidities; anticipated adverse events, particularly cognitive impairment; and the risks of not having treatment.

1.3 The risks associated with ECT may be enhanced during pregnancy, in older people, and in children and young people, and therefore clinicians should exercise particular caution when considering ECT treatment in these groups.

1.4 Valid consent should be obtained in all cases where the individual has the ability to grant or refuse consent. The decision to use ECT should be made jointly by the individual and the clinician(s) responsible for treatment, on the basis of an informed discussion. This discussion should be enabled by the provision of full and appropriate information about the general risks associated with ECT (see Section 1.9) and about the risks and potential benefits specific to that individual. Consent should be obtained without pressure or coercion, which may occur as a result of the circumstances and clinical setting, and the individual should be reminded of their right to withdraw consent at any point. There should be strict adherence to recognised guidelines about consent and the involvement of patient advocates and/or carers to facilitate informed discussion is strongly encouraged.

1.5 In all situations where informed discussion and consent is not possible advance directives should be taken fully into account and the individual's advocate and/or carer should be consulted.

1.6 Clinical status should be assessed following each ECT session and treatment should be stopped when a response has been achieved, or sooner if there is evidence of adverse effects. Cognitive function should be monitored on an ongoing basis, and at a minimum at the end of each course of treatment.

1.7 It is recommended that a repeat course of ECT should be considered under the circumstances indicated in 1.1 only for individuals who have severe depressive illness, catatonia or mania and who have previously responded well to ECT. In patients who are experiencing an acute episode but have not previously responded, a repeat trial of ECT should be undertaken only after all other options have been considered and following discussion of the risks and benefits with the individual and/or where appropriate their carer/advocate.

1.8 As the longer-term benefits and risks of ECT have not been clearly established, it is not recommended as a maintenance therapy in depressive illness.

1.9 The current state of the evidence does not allow the general use of ECT in the management of schizophrenia to be recommended.

1.10 National information leaflets should be developed through consultation with appropriate professional and user organisations to enable individuals and their carers/advocates to make an informed decision regarding the appropriateness of ECT for their circumstances. The leaflets should be evidence based, include information about the risks of ECT and availability of alternative treatments, and be produced in formats and languages that make them accessible to a wide range of service users.

2 Clinical need and practice

2.1 This appraisal considers electroconvulsive therapy (ECT) in the treatment of: depressive illness, schizophrenia, catatonia and mania.

2.2 Depressive illness is associated with discrete episodes that are characterised by feelings of sadness, despair, loss of interest in daily life and discouragement. The severity of depressive illness is determined by the number, intensity and frequency or persistence of depressive symptoms and the presence of specific symptoms such as delusions, hallucinations and suicidal ideation. Severe depressive illness can deteriorate into a 'depressive stupor' where a person is conscious but is non-responsive to any stimulation. This extreme manifestation of depressive illness has become less frequent because of the advent of modern treatments.

2.3 Schizophrenia is characterised by a broad range of cognitive, emotional and behavioural problems, which are in general classified into positive and negative symptoms. Individuals with delusions or hallucinations are described as psychotic.

2.4 Catatonia is a syndrome that is associated with both schizophrenia and affective (mood) disorders. It is characterised by marked changes in muscle tone or activity that may alternate between the extremes of a deficit of movement (catatonic stupor) and excessive movement (catatonic excitement).

2.5 Mania is characterised by elated, euphoric or irritable mood and increased energy. The term may refer to a mental disorder or to a mood state or symptom, and mania is associated with bipolar disorders. In severe manic episodes, individuals are psychotic and require continual supervision to prevent physical harm to themselves or others.

2.6 In 2000, the Psychiatric Morbidity Survey conducted by the Office of National Statistics (ONS) found the prevalence of a depressive episode per thousand population to be 25 in England and 37 in Wales. The prevalence of schizophrenia is estimated at between 2 and 10 per 1000 in the general population, and the incidence of first-onset schizophrenia is approximately 1 per 10,000 population per year. Recent estimates have suggested that bipolar affective disorder has a point prevalence of up to 50 per 1000 of the general population, of whom 1% are admitted to hospital for mania each year. There are no recent epidemiological studies on the incidence of catatonia.

2.7 Depressive illness, schizophrenia and mania are frequently chronic, relapsing conditions and are associated with considerable suicide risk. Diagnosable depressive disorders are implicated in between 40% and 60% of suicide attempts. The 2000 ONS Psychiatric Morbidity Survey found that in individuals with a current depressive episode, 5% reported a suicide attempt within the past year. Common estimates are that 10% of people with schizophrenia will eventually have a completed suicide, and that attempts are made at two to five times that rate.

2.8 Severe mental heath disorders are associated with considerable personal suffering, occupational and social disadvantage and impairment in interpersonal and family relationships in the long term. They also have a high economic impact, with the indirect costs far exceeding the direct costs.

2.9 Depressive illness is managed with antidepressants, psychotherapy and counselling, either alone or in combination. Although the management of schizophrenia frequently centres on antipsychotic medication, individuals also require substantial clinical, emotional and social support. Catatonia is usually treated with benzodiazepines; the introduction of effective psychotropic agents has led to a marked reduction in its prevalence. Acute manic episodes are treated with antipsychotics, lithium or anticonvulsants. Many individuals with mental health disorders benefit from self-help techniques including support groups.

2.10 ECT is used in current UK clinical practice as a treatment option for individuals with depressive illness, catatonia and mania. It is also occasionally used to treat schizophrenia. Guidelines for the use of ECT were developed by the Royal College of Psychiatrists in 1995 and are currently undergoing revision. Guidance for nurses has also been produced by the Royal College of Nursing.

3 The technology

3.1 During ECT, an electric current is passed briefly through the brain, via electrodes applied to the scalp, to induce generalised seizure activity. The individual receiving treatment is placed under general anaesthetic and muscle relaxants are given to prevent body spasms. The ECT electrodes can be placed on both sides of the head (bilateral placement) or on one side of the head (unilateral placement). Unilateral placement is usually to the non-dominant side of the brain, with the aim of reducing cognitive side effects. The amount of current required to induce a seizure (the seizure threshold) can vary up to 40 fold between individuals.

3.2 Although ECT has been used since the 1930s, there is still no generally accepted theory that explains its mechanism of action. The most prevalent hypothesis is that it causes an alteration in the post-synaptic response to central nervous system neurotransmitters.

3.3 In recent years, there have been moves to improve standards in the administration of ECT, with the introduction of practice guidelines published by the Royal College of Psychiatrists and the Royal College of Nursing, and the monitoring of the implementation of these guidelines through ongoing audit. However, there is still variation in the use and practice of ECT within England and Wales.

3.4 ECT administration affects the central nervous system and causes changes in cardiovascular dynamics, which dictates the need for special caution in those individuals who are at increased risk of a cardiovascular event. There are also other immediate potential complications, such as status epilepticus, laryngospasm and peripheral nerve palsy, which overall have an estimated incidence of 1 per 1300 to 1400 treatments. The mortality associated with ECT is reported not to be in excess of that associated with the administration of a general anaesthetic for minor surgery.

3.5 ECT may cause short- or long-term memory impairment for past events (retrograde amnesia) and current events (anterograde amnesia). As this type of cognitive impairment is a feature of many mental health problems it may sometimes be difficult to differentiate the effects of ECT from those associated with the condition itself. In addition there are differences between individuals in the extent of memory loss secondary to ECT and their perception of the

loss. However, this should not detract from the fact that a number of individuals find their memory loss extremely damaging and for them this negates any benefit from ECT.

3.6 Advance directives are statements made by an individual that express decisions about the healthcare they wish to receive, in anticipation of a time when they may not be competent to make or communicate such decisions. Clinicians are legally obliged to take informed and unambiguous advance refusals of treatment made by a competent individual into account unless: (1) it does not apply to the circumstances that have arisen; (2) the Mental Health Act is used to override the individual's intentions about treatment; (3) it requires the clinician to do something illegal; or (4) it requires treatment that the clinician considers not to be in the individual's best interests. Advance consents are not legally binding because specific medical treatment cannot be demanded, but clinicians should generally take such wishes into account.

3.7 The number of sessions undertaken during a course of ECT usually ranges from 6 to 12, although a substantial minority of patients respond to fewer than 6 sessions. ECT is usually given twice a week; less commonly it is given once a fortnight or once a month as continuation or maintenance therapy to prevent the relapse of symptoms. It can be given on either an inpatient or day patient basis. In England between January and March 1999, there were 16,482 administrations of ECT to 2835 individuals, 41% of whom were aged 65 years or over. Seventy-five per cent of the individuals were not formally detained under the Mental Health Act 1983, and of the 709 individuals formally detained, 59% did not or were not able to consent to treatment.

3.8 Six treatment sessions of ECT have been estimated to cost £2475. This does not include inpatient costs, estimated as £171 per day.

4 Evidence and interpretation

The Appraisal Committee considered evidence from a number of sources (see Appendix B).

4.1 Clinical effectiveness

4.1.1 The evidence presented in the Assessment Report was primarily drawn from a recent Cochrane Review of ECT in schizophrenia and a systematic review commissioned by the Department of Health on the use of ECT in schizophrenia, depressive illness and mania. Both reviews are of high quality and consider a total of 119 randomised controlled trials (RCTs) and a number of observational studies. Evidence submitted by patient and professional groups was also considered.

4.1.2 There were problems with the design of many of the RCTs. A large proportion were conducted before the introduction of modern techniques of administering ECT, and therefore do not reflect current practice. There were large variations in the parameters of the ECT administered that included the machine used, the number of sessions, the dosage and wave form, electrode placement, and the type and dosage of concomitant therapy. A number of studies used fixed dosage rather than individual thresholds. There was little evidence to support the routine prescription of a set number of treatment sessions per course of ECT or of the value of continuation (maintenance) ECT. The validity of many of the measurement scales used in the studies to measure outcome has not been clearly established and no study adequately captured either users' views or quality of life.

4.1.3 The Assessment Report reviews data from 90 RCTs in individuals with depressive illness, of different grades of clinical severity, who were referred for ECT. Overall, these RCTs provide evidence that real ECT (that is, where an electric current was applied) is more effective than sham ECT (where no electric current was applied) in the short term. The data provide evidence that the stimulus parameters have an important influence on efficacy; at the end of a course of treatment, bilateral ECT was reported to be more effective than unilateral ECT. Raising the electrical stimulus above the individual's seizure threshold was found to increase the efficacy of unilateral ECT at the expense of increased cognitive impairment. In trials comparing ECT with pharmacotherapy, ECT had greater benefit than the use of certain antidepressants but the trials were of variable quality

and inadequate doses and durations of drug therapy were frequently used. The combination of ECT with pharmacotherapy was not shown to be superior to ECT alone, although the duration of the RCTs was insufficient to show whether pharmacotherapy was beneficial. Compared with placebo, continuation pharmacotherapy with tricyclic antidepressants and/or lithium reduced the rate of relapses in people who had responded to ECT. Preliminary studies indicate that ECT is more effective than repetitive transcranial magnetic stimulation.

4.1.4 Evidence from 25 RCTs suggests that ECT may be effective in acute episodes of certain types of schizophrenia and reduce the occurrence of relapses, although the results are not conclusive and the design of many of the studies did not reflect current practice. The data on differing efficacy related to electrode placement and stimulus parameters are equivocal and firm conclusions could not be drawn. No RCT investigated the use of ECT in comparison with atypical antipsychotics, and the studies that included individuals with treatment-resistant schizophrenia did not consider the use of clozapine. The combined weight of evidence suggests that ECT is not more effective, and may be less effective, than antipsychotic medication. The combination of ECT and pharmacotherapy may be more effective than pharmacotherapy alone, but the evidence is not conclusive.

4.1.5 The four RCTs reviewed in the Assessment Report suggest that ECT may be of benefit in the rapid control of mania and catatonia and this suggestion is supported by evidence from a number of observational studies and testimony from clinical experts. However, the evidence on which to base any general conclusions about the effectiveness of ECT or to determine the most appropriate therapeutic strategy is weak.

4.1.6 There is clear evidence that cognitive impairment occurs both immediately after administration of ECT and following a course of therapy, and this may cause considerable distress to those affected. The impairment is greater in individuals who have had electrodes applied bilaterally than in those who have had them placed unilaterally, and unilateral placement to the dominant hemisphere causes more impairment than placement to the non-dominant hemisphere. A reduction in the risk of cognitive impairment is, however, mirrored by a reduction in efficacy. There is some limited evidence from RCTs to suggest that the effects on cognitive function may not last beyond 6 months, but this has been inadequately researched. There is also evidence to suggest that the impairment of cognitive function associated with ECT differs

between individuals and that it is linked to the dose administered, although the relationship with the seizure threshold has not been adequately defined. There is no evidence to suggest that the effect of ECT on cognitive function differs between diagnoses.

4.1.7 In addition to testimony from user groups, a systematic review of evidence from non-randomised studies relating to patients' accounts and experiences of ECT was also considered. This provided important evidence on the experiences of individuals receiving ECT, particularly cognitive impairment and its impact, and the validity of neuropsychological instruments used in clinical trials. There was evidence that the measurement scales used in RCTs do not adequately capture the nature and extent of cognitive impairment, and qualitative studies have indicated that the impairment may be prolonged or permanent. Additionally, there was testimony that individuals are not provided with sufficient information on which to base a decision regarding consent. Also, some individuals are unaware of their rights to refuse treatment, or may feel unable to do so because of the perceived threat of detainment under the Mental Health Act.

4.1.8 There was no evidence to suggest that the mortality associated with ECT is greater than that associated with minor procedures involving general anaesthetics, and there were limited data on mortality extending beyond the trial periods. The six reviewed studies that used brain-scanning techniques did not provide any evidence that ECT causes brain damage. While there is no evidence to suggest that benefits and safety are age-dependent, there are no studies on the impact of ECT on the developing brain. Furthermore, it is likely that co-morbidities could increase the risk of harm. The use of ECT during pregnancy is known to cause complications, but the risks associated with ECT need to be balanced against the risks of using alternative (drug) treatments.

4.2 Cost effectiveness

4.2.1 There are no published economic studies relating to ECT, and none of the submissions from consultees contained any economic analyses. The Assessment Group therefore constructed economic models of ECT for depressive illness and schizophrenia based on a review of published evidence. They were not able to construct robust models for mania and catatonia because of the low volume of data in these areas.

4.2.2 The depressive illness model had a 1-year time horizon and compared the cost effectiveness of inpatient ECT with other inpatient treatments for adults with severe depressive illness. The key comparators were different classes of antidepressants, with lithium given in addition for third-line therapy. After three drug treatment strategies, non-responders were assumed to receive 8 weeks of psychotherapy and to make a moderate improvement.

4.2.3 The results of the depressive illness model showed that, for eight different scenarios, total costs range from £10,592 to £15,354, and total quality-adjusted life years (QALYs) range from 0.424 to 0.539. Given the small differences in total costs and QALYs between the strategies that included ECT and the one that did not, and the uncertainty in the data available, ECT and pharmacotherapy are likely to be equally cost effective.

4.2.4 The schizophrenia model also had a 1-year time horizon and compared the cost effectiveness of ECT in combination with a typical antipsychotic with that of (a) clozapine, and (b) chlorpromazine or haloperidol for adults hospitalised with treatment-resistant schizophrenia of moderate symptomatology.

4.2.5 The results of the schizophrenia model suggest that ECT is dominated by clozapine – that is, ECT is associated with fewer QALYs (0.842 vs 0.863) at a higher cost (£55,267 vs £34,787). For individuals who do not respond to clozapine, ECT dominates chlorpromazine/haloperidol, resulting in more QALYs (0.842 vs 0.820) at a lower cost (£55,267 vs £58,265). However, these results do not take into account the degree of uncertainty in the estimates of both cost and effectiveness.

4.2.6 To summarise, there is no published evidence regarding the cost effectiveness of ECT. The modelling exercises undertaken by the Assessment Group, while fairly crude and based on a number of uncertain assumptions, suggest that – for those with severe depressive illness and treatment-resistant schizophrenia – ECT and pharmacological treatment may be equally cost effective, with no consistent differences in costs or outcomes.

4.3 Consideration of the evidence

4.3.1 The Committee reviewed the evidence on both the clinical effectiveness and the cost effectiveness of ECT. It considered written and verbal evidence on the nature of the conditions and the experience of people who have received or may be eligible for ECT, those who represent them, and clinical experts. It was also mindful of the need to ensure that its advice took account of the efficient use of NHS resources.

4.3.2 The evidence submitted to the Committee, both written and verbal, demonstrated that, on balance, current opinion is that ECT is an effective treatment for certain subgroups of individuals with mental disorders. However, opinion varies from those who consider that its adverse effects are tolerable to those who consider that it is associated with unacceptable side effects including brain damage, severe confusion and considerable cognitive impairment in both the short and longer terms. While some individuals considered ECT to be a beneficial and lifesaving treatment, others reported feelings of terror, shame and distress, and found it positively harmful and an abusive invasion of personal autonomy, especially when it was administered without their consent.

4.3.3 In consideration of these extremes of opinion, the Committee concluded that the wishes of the patient must be of paramount importance and that it is essential that all attempts should be made to obtain valid and informed consent, following recognised guidelines. The Committee felt strongly that consent should never be obtained by coercion – either explicit or implicit – through threat of compulsory treatment under the Mental Health Act, and mechanisms to monitor and prevent this from occurring should be developed and implemented, in consultation with appropriate professional and user organisations.

4.3.4 Testimony was heard that the information currently given to individuals does not always adequately inform consent, and the Committee discussed the need for nationally agreed evidence-based patient information leaflets. These should be accessible to a wide range of service users (see Section 7) and should emphasise the right of the individual to withhold consent or to withdraw it at any point.

4.3.5 While the limitations of advance directives were appreciated (see Section 3.7), the Committee believed that, whenever possible, they should be developed and documented in individuals' care programmes and be taken into account when considering ECT.

4.3.6 The Committee considered that, on the evidence put before it, the short-term effectiveness of ECT in individuals with severe depressive illness has been demonstrated. There is less robust RCT evidence to suggest that it is effective in the acute treatment of catatonia and mania. However, the Committee considered that the data appraised, taken in conjunction with the strength of clinical opinion and the experiences of users, provided a sufficient basis on which to recommend the use of ECT in restricted circumstances when the alternative treatment options have proven ineffective. The evidence for the effectiveness of ECT in schizophrenia in general was not conclusive and therefore ECT is not recommended in this population. Further research is required to establish clearly the benefits in subgroups of individuals with schizophrenia, for example those with severe symptoms of depressive illness or catatonia.

4.3.7 The Committee considered that there was no conclusive evidence to support the effectiveness of ECT beyond the short term or that it is more beneficial as a maintenance therapy in depressive illness than currently available pharmacological alternatives. It was particularly concerned that the value of ECT maintenance therapy remained unproven in the context of the lack of information on whether the adverse effects of ECT (for example, on cognitive function) may be cumulative with repeated administration.

4.3.8 In appreciation of the special circumstances in which ECT is administered and the recognition that RCTs cannot adequately capture the long-term effects of ECT, the Committee took special note of the evidence from observations of users' experiences relating to the adverse effects of ECT. In particular, the incidence, extent and timescale of cognitive impairment following ECT was discussed in detail. It was apparent that the nature of cognitive impairment experienced by users was variable and often long lasting to such a degree that it outweighed their perception of any benefit from ECT treatment. The Committee considered that further research, both qualitative and quantitative, was needed to define the effect of ECT on cognitive impairment, especially whether the effects are cumulative with repeated administrations. It was also concerned that the potential for cognitive impairment following ECT may not be highlighted during the consent process. These factors featured significantly in the Committee's deliberations, and specifically in its decision to restrict the use of ECT to situations in which all other alternatives had been exhausted or where the nature of the mental illness was considered to be 'life-threatening'.

4.3.9 The Committee noted that the efficacy and adverse effects of ECT are clearly linked to the method of delivery, although the optimum technique and stimulus parameters have not been adequately researched; for example, gains in efficacy as a result of modifications to electrode placement and stimulus parameters are achieved at the expense of an increased risk of cognitive side effects. The Committee therefore considered that the evidence was not sufficient to allow conclusions to be drawn.

4.3.10 The RCT evidence considered by the Committee also leaves unanswered a number of important questions, and these require further research (see Section 5). Consideration was given to the fact that the majority of the RCTs are not applicable to modern practice because of advances in pharmacological management and ECT administration techniques. The outcomes considered in the RCTs also did not adequately capture the experience of service users, and the validity of many of the scales used to measure outcome had not been clearly established. There was insufficient information to allow appropriate risk–benefit assessment for certain groups of individuals, for example during pregnancy, in older individuals, and in children and young people. Of particular concern were the lack of research into the number of treatment sessions that should be given, and the lack of long-term evidence regarding adverse effects on cognitive function and mortality. The Committee could not establish, in the context of the use of appropriate pharmacological treatment, the value of 'maintenance' ECT therapy following its use to achieve rapid and short-term improvement of severe symptoms. The Committee was persuaded on the balance of the evidence received from patients and carers that the practice of 'continuation' of ECT therapy for short periods following the initial control of severe symptoms was only acceptable in the context of Sections 1.6 and 1.7 of the guidance.

4.3.11 The ongoing deficiencies in current practice were highlighted to the Committee, and the Committee strongly believed that action is required to ensure that appropriate standards of care are enforced whenever ECT is undertaken and that outcomes are continuously monitored. The Committee considered that ECT should be administered only in a suitably equipped unit by professionals who have been trained in its delivery and in the anaesthetic techniques required for the administration of ECT. These professionals should maintain an appropriate level of skill, both through the regular clinical practice of ECT and through undertaking appropriate continuing professional development. Urgent consideration should be given to the establishment of units

dedicated to ECT, and of audit networks, which have been shown to be successful in Scotland.

4.3.12 Despite the uncertainty in the estimates of clinical effectiveness and the small differences in costs and outcomes generated in the economic models, the Committee considered that ECT is likely to be cost effective in appropriate patient groups.

4.3.13 In summary, the Committee considered that the evidence appraised supported the effectiveness of ECT in certain groups of individuals. However, the Committee recognised there remained a number of uncertainties, including a lack of information on longer-term outcomes. The Committee was aware of the negative experiences of some individuals who have undergone ECT. Therefore the Committee considered that that ECT should be used with caution and only in the restricted circumstances recommended in the guidance in Section 1. It is anticipated that NICE guidelines currently under development (see Section 8) will further define the place of ECT in the care pathways for individuals with depressive illness.

5 Recommendations for further research

5.1 There are a number of ongoing research projects that include studies of clinical and cost effectiveness in specific groups and an examination of the effects of seizure parameters.

5.2 Further research is urgently required to examine the long-term efficacy and safety of ECT, including its use as a maintenance therapy and its use in particular subgroups who may be at increased risk, for example older people, children and young people, and during pregnancy. This research should reflect modern techniques and the use of ECT in comparison with and in conjunction with the antipsychotic and antidepressant drugs used in current practice. In addition to the use of appropriately validated psychometric scales, outcome measures should include user perspectives on the impact of ECT, the incidence and impact of important side effects such as cognitive functioning, and mortality.

5.3 Further research into the mechanism of action of ECT is encouraged, because it may provide important information on aetiology and future treatment strategies.

5.4 It is clear that the stimulus parameters impact on the safety and efficacy of the technique and recent research needs to be augmented. Further evaluation is needed of whether it is necessary to induce a full seizure for therapeutic effect, and how the efficacy and cognitive effects are influenced by the amount by which the applied electrical dose exceeds the seizure threshold.

5.5 More research is also needed to determine the cost effectiveness of ECT. In particular, better quality-of-life information is needed for people considered for, or who have received, ECT.

6 Implications for the NHS

6.1 As this guidance recommends the use of ECT only in certain restricted circumstances, it is not anticipated that the guidance will increase the use of ECT in England and Wales above current levels. As ECT appears to be of similar cost to alternative treatments, it is unlikely that a change in the use of ECT will result in an increase or decrease in NHS expenditure. However, there will undoubtedly be costs associated with addressing the continuing deficiencies in the standards of care that have been highlighted (see Section 3.3).

7 Implementation and audit

7.1 NHS Trusts should ensure that ECT is carried out in accordance with the recommendations in Section 1 and only by clinical staff trained in its application. Such staff should maintain an appropriate level of skill through routine practice and continuing professional development.

7.2 NHS Trusts currently offering ECT, and all clinicians involved in the care of individuals receiving ECT, should review policies and practices regarding its use to take account of the guidance set out in Section 1.

7.3 Local guidelines or care pathways involving ECT should incorporate the guidance in Section 1.

7.4 To measure compliance locally with the guidance, the following criteria could be used. Further details on suggestions for audit are presented in Appendix D.

7.4.1 ECT is used only for an individual with any of the following:

- severe depressive illness
- catatonia
- a prolonged or severe manic episode.

7.4.2 ECT is used only to achieve rapid and short-term improvement of an individual's severe symptoms after an adequate trial of other treatment options has proven ineffective and/or when the condition is considered to be potentially life threatening.

7.4.3 An assessment of the risks and potential benefits to the individual undergoing ECT is documented. If the individual is pregnant, an older person, or a child or young person, the clinician(s) involved should exercise particular caution and the individual or their advocate or carer should be made aware that the risks associated with ECT may be enhanced in these circumstances.

7.4.4 The individual undergoing ECT provides valid consent if he or she has the ability to grant or refuse consent. In situations where joint decision making, informed discussion and consent are not possible, advance directives are fully taken into account and the individual's advocate and/or carer is consulted.

7.4.5 The consent process provides that the clinician(s) responsible for treatment:

- involves the individual's advocate and/or carer where possible
- provides full and appropriate information in a suitable format and language to enable an informed discussion
- explains and discusses the general risks of ECT, risks specific to the individual and potential benefits to the individual
- does not pressure or coerce the individual into consent to the treatment
- reminds the individual that he or she has the right to withdraw consent at any point.

7.4.6 The individual's clinical status is assessed following each ECT session and the individual's cognitive function is monitored on an ongoing basis and at a minimum at the end of each course of treatment.

7.4.7 ECT treatment is stopped once a response is achieved, if there is evidence of adverse effects, or if the individual withdraws consent.

7.4.8 A repeat course of ECT is considered only for an individual:

- under the circumstances described in 7.4.1 and 7.4.2 above who has previously responded well to ECT
- who has not responded previously but is experiencing an acute episode and all other options have been considered, and following discussion with the individual and/or where appropriate the carer/advocate of the risks and benefits of such a course of action.

7.4.9 ECT is not used as a maintenance therapy in depressive illness.

7.4.10 ECT is not used in the general management of schizophrenia.

7.5 Local clinical audits should include input from service users on at least criteria 7.4.4–7.4.9 and reference to standards in the current handbook on ECT published by the Royal College of Psychiatrists and the Royal College of Nursing, and the suggested indicators for audit of anaesthesia for ECT published by the Royal College of Anaesthetists.

8 Related guidance

8.1 The Institute has issued guidance on the use of newer (atypical) antipsychotic drugs for the treatment of schizophrenia.

- National Institute for Clinical Excellence (2002). Guidance on the use of newer (atypical) antipsychotic drugs for the treatment of schizophrenia. *NICE Technology Appraisal Guidance* No. 43. London: National Institute for Clinical Excellence. Available from: www.nice.org.uk

8.2 The Institute has issued guidance on the use of computerised cognitive behavioural therapy for depressive illness and anxiety,

- National Institute for Clinical Excellence (2002). Guidance on the use of computerised cognitive behavioural therapy for anxiety and depression. *NICE Technology Appraisal Guidance* No. 51. London: National Institute for Clinical Excellence. Available from: www.nice.org.uk

8.3 The Institute is preparing guidance on the use of atypical antipsychotics and anticonvulsants for the treatment of acute mania in bipolar affective disorder (anticipated publication date July 2003).

8.4 The Institute has issued guidelines for schizophrenia: core interventions in the treatment and management of schizophrenia in primary and secondary care. *NICE Clinical Guideline* 1. London: National Institute for Clinical Excellence. Available from: www.nice.org.uk. The Institute is preparing guidelines for depression (anticipated publication date September 2003) and depression in children (publication date to be confirmed).

9 Date for review of guidance

9.1 The guidance on this technology will be reviewed in November 2005.

Andrew Dillon
Chief Executive
April 2003

Appendix A

Appraisal Committee members

NOTE The Appraisal Committee is a standing advisory committee of the Institute. Its members are appointed for a 3-year term. A list of the Committee members who took part in the discussions for this appraisal appears below. The Appraisal Committee meets twice a month other than in December, when there are no meetings. The Committee membership is split into two branches, with the chair, vice-chair and a number of other members attending meetings of both branches. Each branch considers its own list of technologies and topics are not moved between the branches.

Committee members are asked to declare any interests in the technology to be appraised. If there is a conflict of interest, the member is excluded from participating further in that appraisal.

The minutes of each Appraisal Committee meeting, which include the names of the members who attended and their declaration of interests, are posted on the NICE website.

Professor R L Akehurst
Dean, School of Health Related Research, Sheffield University

Professor David Barnett (Chair)
Professor of Clinical Pharmacology, University of Leicester

Professor Sir Colin Berry
Retired Professor of Morbid Anatomy & Histopathology, The Royal London Hospital

Dr Sheila Bird
MRC Biostatistics Unit, Cambridge

Professor Rosamund Bryar
Professor of Community & Primary Care Nursing, St Bartholomew's School of Nursing & Midwifery, London

Professor Martin Buxton
Director of Health Economics Research Group, Brunel University, Uxbridge

Dr Karl Claxton
Health Economist, University of York

Professor Sarah Cowley
Professor of Community Practice Development, Kings College, London

Mr Chris Evennett
(resigned June 2002)
Chief Executive, Mid-Hampshire Primary Care Trust, Winchester

Professor Terry Feest
Clinical Director & Consultant Nephrologist, Richard Bright Renal Unit, & Chair of UK Renal Registry, Bristol

Professor Gary A Ford
Professor of Pharmacology of Old Age/Consultant Physician, Newcastle upon Tyne Hospitals NHS Trust

Mrs Sue Gallagher
Former Chief Executive, Merton, Sutton & Wandsworth Health Authority, London

Dr Trevor Gibbs
Head, Global Clinical Safety & Pharmacovigilance, GlaxoSmithKline, Greenford

Mr John Goulston
Director of Finance, St Bartholoemew's Hospital & the London NHS Trust

Professor Philip Home
Professor of Diabetes Medicine, University of Newcastle upon Tyne

Dr Terry John
General Practitioner, The Firs, London

Dr Diane Ketley
(term of office ended August 2002)
Research into Practice Programme Leader, NHS Modernisation Agency, Leicester

Dr Mayur Lakhani
(term of office ended August 2002)
General Practitioner, Highgate Surgery, Leicester, & Lecturer, University of Leicester

Mr Muntzer Mughal
Consultant Surgeon, Lancashire Teaching Hospitals NHS Trust, Chorley

Mr James Partridge
Lay Representative, Chief Executive, Changing Faces, London

Professor Philip Routledge
Professor of Clinical Pharmacology, College of Medicine, University of Wales, Cardiff

Professor Andrew Stevens (Vice-Chair)
Professor of Public Health, University of Birmingham

Dr Cathryn Thomas
General Practitioner, & Senior Lecturer, Department of Primary Care & General Practice, University of Birmingham

Dr David Winfield
Consultant Haematologist, Royal Hallamshire Hospital, Sheffield

Appendix B

Sources of evidence considered by the Committee

The following documentation and opinions were made available to the Committee:

A **Assessment Report** prepared by The School of Health and Related Research, University of Sheffield and Nuffield Institute for Health, University of Leeds
Electroconvulsive Therapy (ECT) for Depressive Illness, Schizophrenia, Catatonia and Mania, May 2002

B **Professional/specialist group submissions** from:

- British Psychological Society
- Department of Health and Welsh Assembly Government
- Health Technology Board for Scotland
- Hertfordshire Health Authority (now Welwyn Hatfield Primary Care Trust)
- Mental Health Act Commission
- Nursing and Midwifery Council
- Portsmouth City PCT
- Royal College of Anaesthetists
- Royal College of Psychiatrists ECT Sub-committee

C **Patient/carer group submissions** from:

- Depression Alliance
- ECT Anonymous
- Long Term Medial Conditions Alliance
- Manic Depression Fellowship
- MIND
- Rethink (formally the National Schizophrenia Fellowship)
- Sane
- UK Advocacy Network

D **Expert perspectives** from:

- Dr Ian Anderson, Senior Lecturer, Adult Psychiatry, Neuroscience and Psychiatry Unit, University of Manchester
- Andy Brogan, Clinical Executive, Bolton, Salford and Trafford Mental Health Partnership
- Dr C John Bowley, Consultant Anaesthetist, Nottingham City Hospital
- Alison Faulkner, Freelance User/Consultant, Service User Research Enterprise (on behalf of MIND)
- Pete Fleischmann, Researcher and User Involvement Consultant, Service User Research Enterprise (on behalf of MIND)

- Dr Chris Freeman, Chair, Royal College of Psychiatrists ECT sub-Committee
- Louise Puddephatt, Co-chair and ECT Representative, UK Advocacy Network
- Peter Relton, Co-chair, Bradford and District Mental Health Forum (member organisation of UK Advocacy Network)

E. **National Collaborating Centre for Mental Health perspective** from:

- Mr Stephen Pilling, Co-Director, National Collaborating Centre for Mental Health

Appendix C

The use of electroconvulsive therapy

Understanding NICE guidance – information for service users, their advocates and carers, and the public

The information in this appendix has been designed to support the production of your own information leaflets. You can download it from our website at www.nice.org.uk where it is available in English and Welsh. If you would like printed copies of the leaflets please ring the NHS Response Line on 0870 1555 455 and quote reference number N0207 for the English version and N0208 for the version in English and Welsh.

What is NICE guidance?

The National Institute for Clinical Excellence (NICE) is part of the NHS. It produces guidance for both the NHS and patients on the use of medicines, medical equipment, diagnostic tests and clinical and surgical procedures and under what circumstances they should be used.

To produce this guidance, NICE looks at how well the medicine, equipment or procedure works and also how well it works in relation to how much it costs. This process is called an appraisal. The appraisal process involves the manufacturer of the medicine or equipment for which guidance is being produced and the organisations that represent the healthcare professionals, patients and carers who will be affected by the guidance. Each appraisal takes about 12 months to complete.

NICE was asked to look at the available evidence on electroconvulsive therapy and to provide guidance that will help the NHS in England and Wales decide when it should be used.

What are depressive illness, mania, schizophrenia and catatonia?

Depressive illness, mania and schizophrenia are all mental health disorders.

Depressive illness is associated with a change in mood that may not have an obvious cause. It involves feelings of sadness, despair, hopelessness and helplessness, lack of interest in life and difficulty concentrating. These feelings deepen over time. People with severe depressive illness may be unable to eat or sleep or to take part in social activities, and may become completely withdrawn. They may think about harming or killing themselves.

'Mania' is when someone has an extreme elevation of mood, which isn't accounted for by what is happening in his or her life, over-activity and sometimes irritability. People with mania often develop beliefs that they are very powerful, strong or important in ways they wouldn't normally think. When it's very severe, people experiencing a manic episode may do socially unacceptable things they would never normally do, or may try to harm themselves. Sometimes mania occurs on its own but more often it is part of another disorder, bipolar disorder (or manic–depressive illness), when someone experiences periods of mania and depression.

Schizophrenia is a major mental illness that involves a range of symptoms that affect understanding, emotion and behaviour. When people are ill with schizophrenia they usually hear voices (hallucinations) and develop strange ideas and beliefs that others don't agree with (delusions), although exactly what type of symptoms a person has is very individual. Typically in schizophrenia, there's a pattern of repeated breakdowns (or 'acute episodes') but some people are never ill again after the first episode and a small number of people remain ill for much of the time.

Catatonia is characterised by abnormalities of movement or posture. It is sometimes associated with schizophrenia or with mood disorders. Someone with catatonia may remain rigid and unmoving and may stop eating and drinking, or they may become very excited for no apparent reason and move around excessively.

Treatments for depressive illness include medicines, counselling and psychotherapy, which can be given alone or in combination. Treatment for schizophrenia often centres on antipsychotic medicines, but can also include psychological treatments such as family therapy and cognitive behavioural therapy. Catatonia and episodes of mania are usually treated with medicines.

What is electroconvulsive therapy?

Electroconvulsive therapy (or ECT for short) is a treatment that has been used in the treatment of depressive illness, mania, catatonia and, occasionally, schizophrenia. Although ECT has been used since the 1930s, how it works is still not fully understood.

During ECT, electrodes are put onto the head and an electric current is passed briefly though the electrodes to the brain, which causes a seizure (a 'fit'). ECT is given under a general anaesthetic and a muscle relaxant is also given to prevent body spasms.

Usually ECT is given twice a week for 3 to 6 weeks (that is, a course of 6 to 12 sessions of ECT in all). Sometimes, it is given once every 2 weeks or once a month to prevent the symptoms returning.

The heart and blood pressure can be affected by ECT, but the most common problem people report after ECT is short-term or long-term memory loss, which can be very distressing.

There are laws concerning people's consent to have ECT; at the time that this guidance was issued, the draft Mental Health Bill (June 2002), which deals with some of the specific issues that are applicable to ECT, was under consultation.

People can make 'advance directives' about their treatment. An advance directive is a written statement made by someone who is mentally capable of deciding about the treatment they want or do not want to receive if the need arises in the future and they are mentally incapable of giving consent. Advance directives guide health professionals in the event that someone becomes unable to make decisions for him or herself.

What has NICE recommended?

NICE has looked carefully at the evidence and has recommended that ECT should only be used for the treatment of severe depressive illness, a prolonged or severe episode of mania, or catatonia if the conditions described in the following paragraphs are applied.

ECT should be used to gain fast and short-term improvement of severe symptoms after all other treatment options have failed, or when the situation is thought to be life-threatening.

A risk–benefit assessment for the individual should be made and documented. It should include the risks associated with the anaesthetic, whether the person has other illnesses, the possible adverse effects of ECT (particularly problems with memory), and the risks of not having treatment.

Doctors should be particularly cautious when considering ECT treatment for women who are pregnant and for older or younger people, because they may be at higher risk of complications with ECT.

Someone who is mentally capable of making a decision about their treatment should decide, after discussion with the doctor, whether or not they want to give their consent to have ECT. To help in the discussion, full and appropriate information about ECT should be given, including information about its potential risks and benefits, both general and specific to the individual. NICE recommends that information leaflets to help people to make an informed decision about their treatment should be developed nationally and should be available in formats and languages that will make them accessible to a wide range of service users.

The doctor should keep strictly to recognised guidelines about consent, should not put any pressure on the person to give their consent and should remind the person that they have the right to change their mind either for or against treatment at any time. NICE considers that doctors should encourage the involvement of an independent person who speaks on behalf of the service user (an 'advocate') or the person's carer(s).

If discussion and informed consent are not possible at the time treatment is needed, any advance directive should be fully taken into account and someone who speaks on behalf of the person who is ill, or their carer(s), should be consulted.

The person should be re-assessed after every session of ECT. There should be ongoing checks for any signs of memory loss, and as a minimum, a check at the end of each course of treatment.

The treatment should be stopped as soon as the person has responded, if there are any adverse effects, or if they withdraw their consent.

It is recommended that more than one course of ECT should be considered only for people who have severe depressive illness, catatonia or mania and who have previously responded well to ECT. As for the first course of treatment, it should be used only to gain fast and short-term improvement of severe symptoms after all other treatment options have failed or when the situation is thought to be life-threatening. For someone who is experiencing an episode of severe depressive illness, catatonia or mania and who has not responded to a

previous course of ECT, the doctor should consider a repeat course of ECT only if all other treatment options have been considered and after discussion of the risks and benefits with the service user and where appropriate their advocate or carer.

NICE recommends that ECT should not to be used as a long-term treatment to prevent recurrence of depressive illness, and that it should not be used in the general management of schizophrenia.

What should I do?

If you or someone you care for might be recommended for ECT, you should discuss this guidance with your hospital doctor at your next appointment.

Will NICE review its guidance?

Yes. The guidance will be reviewed in November 2005.

Further information?

The NICE website (www.nice.org.uk) has further information on NICE and the full guidance on ECT that has been issued to the NHS. The guidance can also be requested from the NHS Response Line by phoning 0870 1555 455 and quoting reference N0205 .

If you have access to the Internet, you can find more information about depressive illness, manic–depressive illness, and schizophrenia on the NHS Direct website (www.nhsdirect.nhs.uk). You can also phone NHS Direct on 08 45 46 47.

Appendix D

Detail on criteria for audit of the use of electroconvulsive therapy

Objectives for an audit

An audit on electroconvulsive therapy (ECT) could be carried out to ensure that ECT is used appropriately.

Patients to be included in the audit

All individuals who have received ECT in a suitable time period for audit, for example, 6 months or 1 year. Alternatively, the audit could be undertaken concurrently with the provision of ECT treatments.

Measures that can be used as a basis for audit

The measures that can be used in an audit on ECT are as follows.

Criterion	Standard	Exception	Definition of Terms
1. The individual receiving ECT has one of the following: a. severe depressive illness b. catatonia c. a prolonged or severe manic episode	100% of individuals receiving ECT	None	Local clinicians will have to agree on how and where the indications for ECT are documented for audit purposes.
2. ECT is used to achieve rapid and short-term improvement of severe symptoms when an adequate trial of other treatment options has proven ineffective, and/or the individual has a potentially life-threatening condition	100% of individuals receiving ECT	None	Local clinicians will have to agree on how severe symptoms and response to other treatment options and potentially life-threatening conditions are documented for audit purposes.
3. An assessment of the risks and potential benefits of ECT for the individual is documented	100% of individuals receiving ECT	None	The documented assessment before treatment should note: risks associated with the anaesthetic; current co-morbidities; anticipated adverse events, including cognitive impairment; and the risks of no treatment.
4. The individual provides consent for each course of ECT treatment	100% of individuals receiving ECT	A. The individual does not have the ability to grant or refuse consent, in which case advance directives are fully taken into account and the individual's advocate and/or carer are consulted. B. The individual is detained under the Mental Health Act	Local clinicians should agree on how consent to ECT is documented for audit purposes. A course of ECT is usually 6 to 12 sessions, usually given at the rate of two a week. The individual who has had/is having ECT should be asked for his/her views as to whether or not this criterion is being met.

Criterion	Standard	Exception	Definition of Terms
5. The consent process provides that the clinician(s) responsible for treatment carries out **all** of the following: a. involves the individual's advocate and/or carer where possible b. provides full and appropriate information in a suitable format and language to enable an informed discussion c. explains and discusses the general risks of ECT, risks specific to the individual, enhanced risks for individuals in specific groups and potential benefits to the individual d. does not pressure or coerce the individual into consent to the ECT treatment e. reminds the individual that he/she has the right to withdraw consent at any point	100% of individuals receiving ECT	A. The individual is detained under the Mental Health Act B. The individual does not have the ability to grant or refuse consent but is compliant with treatment and 5a-e is carried out with an advocate and/or carer	Local clinicians should agree on how the format and language used to communicate the information provided and the involvement of advocates or carers prior to consent to ECT are documented for audit purposes. See 3 above for a list of general risks to be discussed. Groups of people for whom there may be enhanced risks to be discussed include individuals who are pregnant, older or a child or young person. The individual who has had/is having ECT should be asked for his/her views as to whether or not this criterion is being met.
6. The individual's clinical status is assessed after each ECT session	100% of individuals receiving ECT	None	Local clinicians should agree on what constitutes an assessment of clinical status following an ECT session.
7. The individual's cognitive function is monitored: a. on an ongoing basis **and** b. at a minimum at the end of each course of treatment	100% of individuals receiving ECT	None	Local clinicians should agree on what constitutes monitoring of cognitive function and how monitoring is documented for audit purposes. The individual who has had/is having ECT should be asked for his/her views as to whether or not this criterion is being met.

Criterion	Standard	Exception	Definition of Terms
8. ECT is stopped if one of the following occurs: a. a response is achieved b. there is evidence of adverse effects c. the individual withdraws consent	100% of individuals receiving ECT	None	Local clinicians will have to agree on what constitutes a desired response and evidence of adverse effects for audit purposes. The individuals who has had/is having ECT should be asked for his/her views as to whether or not this criterion is being met.
9. A repeat course of ECT is provided only for an individual in either one of the following circumstances: a. the individual meets criteria 1 and 2 above **and** has previously responded well to ECT **or** b. the individual has not responded previously but is experiencing an acute episode **and** all other options have been considered **and** following discussion with the individual and/or where appropriate the carer or advocate of the risks and benefits of such a course of action	100% of individuals receiving a repeat course of ECT	None	Local clinicians will have to agree on what constitutes a good response to ECT for audit purposes. See 4 above for definition of course of treatment. See 3 and 5 above for reference to risks.

Criterion	Standard	Exception	Definition of Terms
10. ECT is used as a maintenance therapy in depressive illness	0% of individuals receiving ECT	None	
11. ECT is used for the management of schizophrenia	0% of individuals receiving ECT	None	

Calculation of compliance with the measures

Compliance with the measures described in the table is calculated as follows.

$$\frac{\text{Number of individuals whose care is consistent with the } \textbf{criterion } \textbf{\textit{plus}} \text{ the number of individuals who meet an } \textbf{exception}}{\text{Number of patients to whom the } \textbf{measure} \text{ applies}} \times \mathbf{100}$$

Clinicians should review the findings of measurement, identify whether practice can be improved, agree on a plan to achieve any desired improvement, and repeat the measurement of actual practice to confirm that the desired improvement is being achieved.

NHS

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Hip fractures

Question: should all hip fractures be on the same line?

Issue: currently, open fractures of the hip are on line 136 OPEN FRACTURE/DISLOCATION OF EXTREMITIES while closed fractures are on line 85 FRACTURE OF HIP, CLOSED. Line 85 has CPT codes for both open and closed repair of hip fractures. HERC staff do not feel that open hip fractures should be treated differently than closed hip fractures. It would also add clarity to have hip fractures removed from the fracture of extremities line due to the central nature of hip fractures.

HERC staff recommendations:

1) Move open hip fracture ICD-9 and ICD-10 codes from line 136 to line 85
    a. ICD-9 820.x (open fracture of neck of femur)
    b. ICD-10 S72.0xxx (open fracture of head or neck of femur)
2) Remove hip fracture repair CPT codes from line 136
    a. 27236 (Open treatment of femoral fracture, proximal end, neck, internal fixation or prosthetic replacement)
    b. 27267 (Closed treatment of femoral fracture, proximal end, head; without manipulation)
    c. 27268 (with manipulation)
3) Rename line 85 FRACTURE OF HIP~~, CLOSED~~

Section 7.0

New Codes

Cystourethroscopy with Transprostatic Implant for BPH

Question: where should new HCPCS codes regarding cystourethroscopy with implant placement be located on the Prioritized List?

Question source: HERC staff

Issue: 2 new HCPCS codes were issues by CMS on April 1, 2014. These codes need placement on the List.

C9739 Cystourethroscopy with transprostatic implant; 1 to 3 implants
C9740 4 or more implants

Note: it appears that there are new CPT codes for these procedures which were accepted for adoption by the AMA committee in chart of billing codes. It is unclear when these will be formally issues by CMS.

CMS payment information
C9739 $2,007
C9740 $4,750

Transprostatic implants are a new outpatient minimally invasive treatment for benign prostatic hypertrophy (BPH) approved by the FDA in September, 2013. This procedure is considered an alternative to transurethral resection of the prostate (TURP) with lower cost and better sexual function outcomes. This procedure consists of placement of an implantable transprostatic tissue retractor system. The delivery device is inserted transurethrally and deploys the implant through the prostate. It is designed to increase prostatic urethral patency by providing prostate lobe tissue retraction while preserving the potential for future prostate procedures and is intended for the treatment of symptoms due to urinary outflow obstruction secondary to benign prostatic hyperplasia (BPH) in men.

The device is approved for the relief of low or blocked urine flow in men aged 50 and older with BPH. Minor adverse events reported included pain or burning during urination, blood in the urine, frequent or urgent need to urinate, incomplete emptying of the bladder, and decreased urine flow.

Per FDA approval documents, transprostatic implants should not be used if the patient has a Prostate volume of >80 cc, an obstructive or protruding median lobe of the prostate, urinary tract infection, urethra conditions that may prevent insertion of delivery system into bladder, urinary incontinence, current gross hematuria, or a known allergy to nickel.

Evidence

1) **NICE 2014**

a. Current evidence on the efficacy and safety of insertion of prostatic urethral lift implants to treat lower urinary tract symptoms secondary to benign prostatic hyperplasia is adequate to support the use of this procedure

HERC staff recommendation

1) Add HCPCS C9739 (Cystourethroscopy with transprostatic implant; 1 to 3 implants) and C9740 (4 or more implants) to line 331 FUNCTIONAL AND MECHANICAL DISORDERS OF THE GENITOURINARY SYSTEM INCLUDING BLADDER OUTLET OBSTRUCTION

NICE National Institute for Health and Care Excellence

Insertion of prostatic urethral lift implants to treat lower urinary tract symptoms secondary to benign prostatic hyperplasia

Issued: January 2014

NICE interventional procedure guidance 475

guidance.nice.org.uk/ipg475

Healthcare Improvement Scotland

NICE has accredited the process used by the NICE Interventional Procedures Programme to produce interventional procedures guidance. Accreditation is valid for 5 years from January 2010 and applies to guidance produced since January 2009 using the processes described in the 'Interventional Procedures Programme: Process guide, January 2009' and the 'Interventional Procedures Programme: Methods guide, June 2007'. More information on accreditation can be viewed at www.nice.org.uk/accreditation

NICE accredited
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1 Recommendations

1.1 Current evidence on the efficacy and safety of insertion of prostatic urethral lift implants to treat lower urinary tract symptoms secondary to benign prostatic hyperplasia is adequate to support the use of this procedure provided that normal arrangements are in place for clinical governance, consent and audit.

1.2 During the consent process clinicians should, in particular, advise patients about the range of possible treatment options and the possible need for further procedures if symptoms recur.

1.3 The procedure should only be carried out by clinicians with specific training in the insertion of prostatic urethral lift implants.

1.4 NICE encourages further research and publication of results from consecutive case series of patients having this procedure. Details of patient selection should be clearly documented. Reported outcomes should include the effects of the procedure on symptoms and quality of life, the duration of benefits, and the need for further procedures. All complications should be reported. NICE may review this procedure in the light of longer-term outcomes.

2 Indications and current treatments

2.1 Benign prostatic hyperplasia is a common condition that affects older men. It is characterised by an increase in the size of the prostate, which is caused by an increased number of stromal and epithelial cells. Benign prostatic hyperplasia can cause lower urinary tract symptoms including hesitancy during micturition, interrupted or decreased urine stream, nocturia, incomplete voiding and urinary retention.

2.2 Mild symptoms are usually managed conservatively. Drugs such as alpha blockers and 5-alpha-reductase inhibitors can be used. If symptoms are more severe, then surgical treatments may be used including transurethral resection of the prostate (TURP), transurethral vaporisation of the prostate, or holmium laser enucleation of the prostate (see The management of lower urinary tract symptoms in men [NICE clinical guideline 97]).

3 The procedure

3.1 The aim of insertion of prostatic urethral lift implants for lower urinary tract symptoms secondary to benign prostatic hyperplasia is to secure the prostatic lobes in retracted positions such that the lumen of the urethra is increased. The procedure is designed to cause less tissue injury than surgical resection or thermal ablation, and it is claimed to reduce the risk of complications such as sexual dysfunction and incontinence.

3.2 The procedure is undertaken transurethrally with the patient under local or general anaesthesia. A pre-loaded delivery device is passed through a rigid sheath under cystoscopic visualisation. The delivery device is used to compress one lateral lobe of the prostate in an anterolateral direction towards the prostatic capsule. A needle is then advanced through the lobe and capsule, and a monofilament implant with 2 end pieces is deployed. One end of the implant is anchored in the urethra and the other on the outer surface of the prostatic capsule, retracting the prostatic lobe away from the urethral lumen. Multiple implants are usually inserted during the same procedure.

4 Efficacy

This section describes efficacy outcomes from the published literature that the Committee considered as part of the evidence about this procedure. For more detailed information on the evidence, see the interventional procedure overview.

4.1 In a randomised controlled trial (RCT) of 206 patients comparing 140 patients treated by prostatic urethral lift against 66 patients treated by a sham procedure there was a significant difference in mean change in American Urological Association Symptom Index (AUASI) score (scores range from 0 to 35; higher score indicating greater severity) at 3-month follow-up. The mean score decreased by 11 points at follow-up from a baseline score of 22 in patients treated by prostatic urethral lift and by 6 points at follow-up from a baseline score of 24 in patients treated by the sham procedure (p=0.003 difference between the groups).

4.2 A case series of 64 patients reported a significant improvement in International Prostate Symptom Score (scale 0 to 35; higher score indicating more severe symptoms) at follow-up intervals from 2 weeks to 24 months. The mean score improved from 22 at baseline to 13 at 2-year follow-up (n=33; p<0.001).

4.3 The RCT of 206 patients reported a significant difference in change in AUASI quality-of-life scores (scale 0 to 5; higher score indicating lower quality of life) at 3 months. The mean quality-of-life score decreased from 5 to 2 in patients treated by prostatic urethral lift and from 5 to 4 in patients treated by the sham procedure (p<0.001 difference between the groups).

4.4 The case series of 64 patients reported Sexual Health Inventory for Men scores (scale assesses erectile dysfunction, with scores ranging from 1 to 25, with 1 being the most severe and 25 being healthy). There was a statistically significant improvement in score in 26 patients (for whom results were reported), from 18 at baseline to 20 at 1-year follow-up (p=0.01).

4.5 The RCT of 206 patients reported a significant improvement in mean urinary flow rate at 3 months. The mean improvement in urinary flow was 4 ml/s in patients treated by prostatic urethral lift and 2 ml/s in patients treated by the sham procedure (from 8 ml/s at baseline for both groups; p=0.005 difference between the groups).

4.6 A case series of 19 patients reported a significant reduction in mean post-voiding residual volume, from 147 ml at baseline to 46 ml at 3-month follow-up (n=11; p=0.01).

4.7 The RCT of 206 patients reported retreatment at 1 year in 5% (7/140) of patients treated by prostatic urethral lift. Five patients underwent further prostatic urethral lift treatment because of insufficient response and 2 patients were treated by transurethral prostate resection (TURP) or laser vaporisation (reasons for retreatment not reported). The case series of 64 patients reported that 20% (13/64) of patients had further procedures. Four patients had TURP or photoselective vaporisation of the prostate within 7 months. Nine patients with symptomatic improvement after the initial procedure had TURP (n=4), photoselective vaporisation (n=4) or prostatic urethral lift (n=1) (at a mean of

13 months after the procedure) because of recurrent lower urinary tract symptoms.

4.8 The specialist advisers listed key efficacy outcomes as symptom improvement, improvement in quality of life, reducing or stopping medical therapy, flow improvement, reduction in post-void residual volume and maintenance of sexual and ejaculatory function.

5 Safety

This section describes safety outcomes from the published literature that the Committee considered as part of the evidence about this procedure. For more detailed information on the evidence, see the interventional procedure overview.

5.1 Urinary tract infections (within 3 months of the procedure) were reported in 3% (4/140) of patients treated by prostatic urethral lift and 2% (1/66) of patients treated by a sham procedure in the randomised controlled trial of 206 patients (level of significance not reported).

5.2 Orchitis was reported in 3% (3/102) of patients in a case series of 102 patients (duration and timing not reported).

5.3 Symptoms of prostatitis (penile and perineal discomfort, pain on erection and ejaculation) were reported in 1 patient in the case series of 64 patients (treated with antibiotics).

5.4 Urinary retention (within 30 days of the procedure) was reported in 16% (3/19) of patients in the case series of 19 patients (reported as lasting median 3.5 days; no further details given).

5.5 Transient urge incontinence was reported in 8% (5/64) of patients in the case series of 64 patients (resolved within 8 days).

5.6 Incomplete voiding (within 30 days of the procedure) was reported in 1 patient in the case series of 19 patients (lasting 42 days).

5.7 Erectile dysfunction was reported within 30 days of the procedure in 11% (2/19) of patients in the case series of 19 patients. This spontaneously resolved after 23 days in 1 patient and 127 days in the other patient.

5.8 The specialist advisers listed bleeding, prostatic swelling and retention (needing catheterisation) as anecdotal adverse events. The specialist advisers considered vascular and rectal injury to be theoretical adverse events.

6 Committee comments

6.1 The Committee recognised that, in common with other treatment options, insertion of prostatic urethral lift implants is not likely to offer permanent relief of symptoms. Some patients may prefer it to other procedures that have a greater risk of causing sexual dysfunction. Certain patients may also prefer this procedure to prolonged drug therapy.

6.2 The Committee was advised that subsequent treatments are possible after this procedure.

7 Further information

7.1 For related NICE guidance see the NICE website.

Information for patients

NICE has produced information on this procedure for patients and carers (Information for the public). It explains the nature of the procedure and the guidance issued by NICE, and has been written with patient consent in mind.

About this guidance

NICE interventional procedures guidance makes recommendations on the safety and efficacy of the procedure. It does not cover whether or not the NHS should fund a procedure. Funding decisions are taken by local NHS bodies after considering the clinical effectiveness of the procedure and whether it represents value for money for the NHS.

This guidance was developed using the NICE interventional procedures guidance process.

We have produced a summary of this guidance for patients and carers. Information about the evidence the guidance is based on is also available.

NICE produces guidance, standards and information on commissioning and providing high-quality healthcare, social care, and public health services. We have agreements to provide certain NICE services to Wales, Scotland and Northern Ireland. Decisions on how NICE guidance and other products apply in those countries are made by ministers in the Welsh government, Scottish government, and Northern Ireland Executive. NICE guidance or other products may include references to organisations or people responsible for commissioning or providing care that may be relevant only to England.

Your responsibility

This guidance represents the views of NICE and was arrived at after careful consideration of the available evidence. Healthcare professionals are expected to take it fully into account when exercising their clinical judgement. This guidance does not, however, override the individual responsibility of healthcare professionals to make appropriate decisions in the circumstances of the individual patient, in consultation with the patient and/or guardian or carer.

Implementation of this guidance is the responsibility of local commissioners and/or providers. Commissioners and providers are reminded that it is their responsibility to implement the guidance, in their local context, in light of their duties to have due regard to the need to eliminate unlawful discrimination, advance equality of opportunity and foster good relations. Nothing in this guidance should be interpreted in a way that would be inconsistent with compliance with those duties.

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Section 8.0

Biennial Review

Injury to Blood Vessels in the Neck

Question: should a new line be created for injury to the major blood vessels of the neck?

Question source: HERC staff

Issue: Line 135 CRUSH INJURIES OTHER THAN DIGITS; COMPARTMENT SYNDROME contains the ICD-10 codes for injury to the carotid artery (S15.0xx), vertebral artery (S15.1xx), jugular vein (S15.2xx, S15.3xx), specified neck vessel (S15.8xx) and unspecified neck vessel (S15.9xx) as well as the CPT codes for repair of these injuries.

35201 Repair blood vessel, direct; neck
35231 Repair blood vessel with vein graft; neck
37615 Ligation, major artery (eg, post-traumatic, rupture); neck
37565 Ligation, internal jugular vein

Other lines with arterial/major vein injury diagnoses:
82 INJURY TO MAJOR BLOOD VESSELS OF EXTREMITIES
87 DEEP OPEN WOUND OF NECK, INCLUDING LARYNX; FRACTURE OF LARYNX OR TRACHEA
280 INJURY TO BLOOD VESSELS OF THE THORACIC CAVITY

At the March 2014 VBBS meeting, HERC staff was directed to create a new line for injury to blood vessels of the neck. If this line scoring placed the line in close proximity to another line with blood vessel injury codes, then the neck blood vessel injury diagnoses could be added to the existing line rather than be a separate line.

HERC staff recommendation:

1) Create a new line for injury to blood vessels of the neck

   Line XXX
   INJURY TO MAJOR BLOOD VESSELS OF THE NECK
   Treatment: repair
   ICD10: S15.xxx
   CPT: 35201, 35231,37615,37565, outpatient and inpatient office visits/hospital visits

Scoring (current scoring for Crush Injury line in parentheses)
Category :6 (6)
HL: 8 (7)
Suffering: 4 (4)
Population effects: 0 (0)
Vulnerable population: 0 (0)

Tertiary prevention: 2 (2)
Effectiveness: 4 (4)
Need for service: 1 (1)
Net cost: 2 (1)
Score: 2240
Approximate line placement: 104

2) Alternate: Add injury to neck vessel diagnoses and treatments to line 82 and rename line INJURY TO MAJOR BLOOD VESSELS OF EXTREMITIES AND NECK

2014 Biennial Review of the Prioritized List

Work done to date:

1) Creation of new line for gender dysphoria
2) Open wound of eardrum line deleted
3) Creation of new line/re-prioritization of fibromyalgia

Items for current meeting:

1) Somatization/factitious disorder line merge
2) Restructuring of low back pain lines
3) Creation of a miscellaneous line with no treatments necessary
4) Injury to neck blood vessel line
5) Lymphedema line
6) Consideration of prioritization of gender reassignment surgery for gender dysphoria (as part of gender dysphoria discussion)

Remaining items:

1) Deletion of audient bone conductor for conductive hearing loss line

Lymphedema for Oct 2014

Question: Should the lymphedema line be given a higher priority?

Question source: HERC staff

Issue: Lymphedema was extensively discussed in 2007 at the HOSC/HSC. As a result of these discussions, "other lymphedema" (ICD-9 457.1) was moved from line 598 LYMPHEDEMA to line 448 COMPLICATIONS OF A PROCEDURE USUALLY REQUIRING TREATMENT [April 1, 2014 List line numbers]. Post-matectomy lymphedema (ICD-9 457.0) was already on line 448. Currently, line 598 has only a few miscellaneous lymph conditions on it.

During the ICD-10 review, Lymphedema, NOS (I89.0) was placed back on line 579 LYMPHEDEMA. There is no discussion of this change at the VBBS/HERC level during the ICD-10 review.

After discussion with HERC leadership, HERC staff moved I89.0 back to line 427 COMPLICATIONS OF A PROCEDURE USUALLY REQUIRING TREATMENT for the October 1, 2014 Prioritized List (see List corrections document).

HERC staff feel that is was the intent of the Commission to cover lymphedema, and consider the best approach to be to move the lymphedema line to a higher priority position. Having lymphedema conditions on the complications line rather than the actual lymphedema line is problematic and confusing.

Inidentally, I89.1 (lymphangitis) was located on line 579 but all other acute lymphangitis codes (L03.0x) are located on line 209. Similarly, 457.2 (lymphangitis) is on line 598 LYMPHEDEMA while all similar codes are on line 214.

Lymphedema for Oct 2014

ICD-10 Code placement

ICD-10 Code	Diagnosis	Current Line	Proposed Line
I89.0	Lymphedema, NOS	427 COMPLICATIONS OF A PROCEDURE USUALLY REQUIRING TREATMENT	XXX LYMPHEDEMA
I89.1	Lymphangitis	579 LYMPHEDEMA	209 SUPERFICIAL ABSCESSES AND CELLULITIS
I89.8	Other specified noninfective disorders of lymphatic vessels and lymph nodes	579	XXX LYMPHEDEMA
I89.9	Noninfective disorder of lymphatic vessels and lymph nodes, unspecified	579	XXX LYMPHEDEMA
I97.2	Postmastectomy lymphedema syndrome	427	XXX LYMPHEDEMA
Q82.0	Hereditary lymphedema	579	XXX LYMPHEDEMA

ICD-9 Code placement

ICD-10 Code	Diagnosis	Current Line	Proposed Line
457.0	Postmastectomy lymphedema syndrome	448 COMPLICATIONS OF A PROCEDURE USUALLY REQUIRING TREATMENT 597 OTHER COMPLICATIONS OF A PROCEDURE	XXX LYMPHEDEMA
457.1	Other lymphedema	597	XXX LYMPHEDEMA
457.2	Lymphangitis	598 LYMPHEDEMA	214 SUPERFICIAL ABSCESSES AND CELLULITIS
457.8	Other noninfectious disorders of lymphatic channels	598	XXX LYMPHEDEMA
457.9	Unspecified noninfectious disorder of lymphatic channels	598	XXX LYMPHEDEMA
757.0	Hereditary lymphedema	598	XXX LYMPHEDEMA

Lymphedema for Oct 2014

HERC staff recommendations:

1) Move the following ICD-9 codes to the lymphedema line and remove from all other lines
    a. 457.0 Postmastectomy lymphedema syndrome
    b. 457.1 Other lymphedema
2) Move the following ICD-10 codes to the lymphedema line and remove from all other lines
    a. Postmastectomy lymphedema (I97.2)
    b. Lymphedema, NOS (I89.0)
3) Move 457.1/I89.1 (lymphangitis) to line 214/209 SUPERFICIAL ABSCESSES AND CELLULITIS and remove from line 598/579
4) Reprioritize the lymphedema line

Line XXX
Condition: LYMPHEDEMA
Treatment: MEDICAL THERAPY, OTHER OPERATION ON LYMPH CHANNEL
ICD-9: 457.0-457.9, 757.0
ICD-10: I89.0, I89.8, I89.9, Q82.0
CPT codes: same as current lymphedema line

Scoring (current scoring for Lymphedema line in parentheses)
Category :7 (7)
HL: 4 (1)
Suffering: 1 (1)
Population effects: 0 (0)
Vulnerable population: 0 (0)
Tertiary prevention: 2 (1)
Effectiveness: 3 (1)
Need for service: 0.8 (0.5)
Net cost: 3 (3)
Score: 288 (30)
Approximate line placement: line 470

Biennial Review—Somatization and Factitious Disorders

Issue: The Behavioral Health Advisory Panel (BHAP) has recommended that line 497 SOMATIZATION DISORDER, SOMATOFORM PAIN DISORDER, CONVERSION DISORDER and line 462 FACTITIOUS DISORDERS be merged. They requested that this merged line be named "SOMATIC SYMPTOMS AND RELATED DISORDERS" and contain consultation, office-based interventions, health and behavior procedure codes. The advisory group requested that the merged line be placed at line 462 (in the funded region of this version of the Prioritized List). During the last biennial review, the Mental Health and Chemical Dependency advisory group (MHCD) had re-prioritized Somatization below the funding line. BHAP requested that HERC staff devise a proposal for this line merge.

Prioritized List lines for the October 1, 2014 ICD-10 List

Line: 462

Condition: FACTITIOUS DISORDERS (See Guideline Notes 64,65)
Treatment: CONSULTATION
ICD-10: F68.1x (Factitious disorder)
CPT: Psychiatric visit (90785-90887), psychological testing (96101), Telephone/on-line assessment (98966-98969, 99441-99449), other office services (99051,99060,90970, 90978), office visits (99201-99215), ER (99281-99285), Rest home/domiciliary (99324-99340), home visit (99341-99350), prolonged service (99354-99360), anticoagulation monitoring (99363-99364), medical team conference (99366-99368), supervision of home health (99374-99375), supervision of hospice (99377-99378), preventive care visit (99381-99397), risk reduction (99401-99404, 99411-99412), SBIRT (99408-99409), complex chronic care co-ordination (99487-99489), transitional care management (99495-99496), medication therapy management (99605-99607)
HCPCS: G0410,G0411,G0425-G0427,H0004,H0023,H0032-H0037, H2010, H2011, H2013, H2021 ,H2022,H2033,S0270-S0274,S9484,T1016

Line: 497

Condition: SOMATIZATION DISORDER; SOMATOFORM PAIN DISORDER, CONVERSION DISORDER (See Guideline Notes 64,65)
Treatment: MEDICAL/PSYCHOTHERAPY
ICD-10: F44.x (conversion disorder), F45x (somatization disorder), F52.5 (vaginismus)
CPT: limited psychiatric services (90846, 90849, 90853, 90882, 90887), Telephone/on-line assessment (98966-98969, 99441-99449), other office services (99051,99060,90970, 90978), office visits (99201-99215), ER (99281-99285), Rest home/domiciliary (99324-99340), home visit (99341-99350), prolonged service (99354-99360), anticoagulation monitoring (99363-99364), medical team conference (99366-99368), supervision of home health (99374-99375), supervision of hospice (99377-99378), preventive care visit (99381-99397), risk reduction (99401-99404, 99411-99412), SBIRT (99408-99409), complex chronic care co-ordination (99487-99489), transitional care management (99495-99496), medication therapy management (99605-99607)

HCPCS: G0410,G0411,G0425-G0427,H0004,H0017-H0019,H0023,H0032-H0034, H0037, H0038, H2010,H2021-H2023,H2027,H2033,S0270-S0274,S9484,T1016

HERC staff recommendation:

1) Merge lines 462 and 497
    1) Include consultation only, as this was the factitious disorder line restriction and somatization was below the funding line prior to this proposed merger
    2) Re-score this combined line as shown below

Line XXX
Condition: SOMATIC SYMPTOMS AND RELATED DISORDERS
Treatment: CONSULTATION
ICD-10 F68.1x (Factitious disorder), F44.x (conversion disorder), F45x (somatization disorder), F52.5 (vaginismus)
CPT: from line 462 (has full set of psychiatric visit types) + 96150-96154 (health and behavior assessment codes)
HCPCS: from line 497 (more comprehensive set)

Scoring (current scoring for Somatization Disorder line in parentheses)
Category :7 (7)
HL: 2 (2)
Suffering: 2 (2)
Population effects: 0 (0)
Vulnerable population: 0 (0)
Tertiary prevention: 0 (0)
Effectiveness: 1 (2)
Need for service: 0.8 (1)
Net cost: 2 (3)
Score: 64
Approximate line placement: 558

Biennial Review: Low back pain lines

Question: should the low back pain lines be re-organized from pain with/without radicular symptoms to effective/not effective treatments?

Question source: HERC staff

Issue: the current low back pain lines are organized around pain with radicular symptoms (on a covered line) and pain without radicular symptoms (on an uncovered line). A recent EGBS review found some effective treatments for low back pain, which were adopted as a guideline. As part of the 2016 Biennial review, HERC staff would like to reconsider reorganizing the low back pain lines into a line with effective treatments in the covered region of the Prioritized List and a line with ineffective treatments in the uncovered region.

The spinal deformities lines contain many diagnoses that result in back pain and/or radiculopathy. Additionally, there are musculoskeletal diagnoses on line 616 SPRAINS AND STRAINS OF ADJACENT MUSCLES AND JOINTS, MINOR that should be included on the new low back pain lines. The diagnoses which are appropriate for the new back pain lines have been identified.

Current Prioritized List lines and associated guidelines:

Line: 374

Condition:	DISORDERS OF SPINE WITH NEUROLOGIC IMPAIRMENT (See Guideline Notes 6,37,64,65,72,76,92,94,100,101,105)
Treatment:	MEDICAL AND SURGICAL TREATMENT
ICD-10:	G83.4,G95.0,M43.8x9,M45.0-M45.8,M46.81-M46.88,M46.91-M46.98,M47.20-M47.28,M50.00-M50.23, M51.04-M51.27,M53.2x1-M53.2x8,M54.11-M54.18,Q06.0-Q06.3,Q06.8-Q06.9,S13.0xxA-S13.0xxD, S23.0xxA-S23.0xxD,S33.0xxA-S33.0xxD,S34.3xxA-S34.3xxD
CPT:	20660-20662,20665,20930-20938,22532-22819,22840-22865,62287,62311,62355,62365-63091,63170-63200,63270-63273,63295-63610,63650,63655,63685,64400-64455,64483,64484,64505-64530,95990, 96150-96154,97001-97004,97022,97110-97124,97140-97530,97535,97542,97760-97762,97810-98942, 98966-98969,99051,99060,99070,99078,99201-99239,99281-99285,99291-99404,99408-99412,99429-99449,99471-99476,99487-99496,99605-99607
HCPCS:	G0157-G0161,G0396,G0397,G0406-G0408,G0425-G0427,G0463,S2350,S2351

Line: 400
Condition: DISORDERS OF SPINE WITH NEUROLOGIC IMPAIRMENT (See Guideline Notes 6,37,64,65,72,76,92,94,100,101,105)
Treatment: MEDICAL AND SURGICAL TREATMENT
ICD-9: 336.0,344.60-344.61,349.2,722.0,722.10-722.2,722.70-722.73,723.4,724.4,742.59,V57.1,V57.21-V57.3,V57.81-V57.89
CPT: 20660-20662,20665,20930-20938,22532-22819,22840-22865,62287,62311,62355,62365-63091,63170-63200, 63270-63273,63295-63610,63650,63655,63685,64483,64484,95990,96150-96154,97001-97004,97022,97110-97124,97140-97530,97535,97542,97760-97762,97810-98942,98966-98969,99051,99060,99070,99078,99201-99239,99281-99360,99366,99374,99375,99379-99412,99429-99449,99471-99476,99487-99496,99605-99607
HCPCS: G0157-G0161,G0396,G0397,G0406-G0408,G0425-G0427,G0463,S2350,S2351

Line: 545
Condition: ACUTE AND CHRONIC DISORDERS OF SPINE WITHOUT NEUROLOGIC IMPAIRMENT (See Guideline Notes 6,37,56,64,65,72,92,94,101,105)

Biennial Review: Low back pain lines

Treatment: MEDICAL AND SURGICAL TREATMENT
ICD-10: M24.08,M25.78,M43.20-M43.28,M43.8x9,M46.1,M46.40-M46.49,M47.811-M47.9,M48.30-M48.38, M48.9,M50.20-M50.93,M51.24-M51.9,M53.2x7-M53.2x8,M53.3,M53.80-M53.9,M54.00-M54.09,M54.2, M54.5-M54.6,M54.81-M54.9,M62.830,M96.1,M99.00-M99.09,M99.12-M99.13,S13.0xxA-S13.0xxD, S13.4xxA-S13.4xxD,S13.8xxA-S13.8xxD,S13.9xxA-S13.9xxD,S16.1xxA-S16.1xxD,S23.0xxA-S23.0xxD, S23.100A-S23.100D,S23.101A-S23.101D,S23.110A-S23.110D,S23.111A-S23.111D,S23.120A-S23.120D,S23.121A-S23.121D,S23.122A-S23.122D,S23.123A-S23.123D,S23.130A-S23.130D, S23.131A-S23.131D,S23.132A-S23.132D,S23.133A-S23.133D,S23.140A-S23.140D,S23.141A-S23.141D,S23.142A-S23.142D,S23.143A-S23.143D,S23.150A-S23.150D,S23.151A-S23.151D, S23.152A-S23.152D,S23.153A-S23.153D,S23.160A-S23.160D,S23.161A-S23.161D,S23.162A-S23.162D,S23.163A-S23.163D,S23.170A-S23.170D,S23.171A-S23.171D,S23.3xxA-S23.3xxD, S23.8xxA-S23.8xxD,S23.9xxA-S23.9xxD,S33.0xxA-S33.0xxD,S33.100A-S33.100D,S33.101A-S33.101D,S33.110A-S33.110D,S33.111A-S33.111D,S33.120A-S33.120D,S33.121A-S33.121D, S33.130A-S33.130D,S33.131A-S33.131D,S33.140A-S33.140D,S33.141A-S33.141D,S33.5xxA-S33.5xxD,S33.9xxA-S33.9xxD,S39.092A-S39.092D,S39.82xA-S39.82xD,S39.92xA-S39.92xD
CPT: 20550,20660,20661,20665,22856-22865,27035,62367-62370,95990,96150-96154,97001-97004,97022, 97110-97124,97140-97530,97535,97542,97760-97762,97810-98942,98966-98969,99051,99060,99070, 99078,99201-99239,99281-99285,99291-99404,99408-99412,99429-99449,99471-99476,99487-99496, 99605-99607
HCPCS: G0157-G0161,G0396,G0397,G0406-G0408,G0425-G0427,G0463

Line: 562
Condition: ACUTE AND CHRONIC DISORDERS OF SPINE WITHOUT NEUROLOGIC IMPAIRMENT (See Guideline Notes
6,37,56,64,65,72,92,94,101,105)
Treatment: MEDICAL AND SURGICAL TREATMENT
ICD-9: 336.0,349.2,720.2,721.0,721.2-721.3,721.7-721.8,721.90,722.0,722.10-722.93,723.1,723.3-723.9,724.1-724.2, 724.4-724.6,724.70-724.9,739.0-739.9,742.59,754.1,839.20-839.21,847.0-847.9,V57.1,V57.21-V57.3,V57.81-V57.89
CPT: 20550,20660,20661,20665,22856-22865,27035,62367-62370,95990,96150-96154,97001-97004,97022,97110-97124,97140-97530,97535,97542,97760-97762,97810-98942,98966-98969,99051,99060,99070,99078,99201-99239,99281-99360,99366,99374,99375,99379-99412,99429-99449,99471-99476,99487-99496,99605-99607
HCPCS: G0157-G0161,G0396,G0397,G0406-G0408,G0425-G0427,G0463

GUIDELINE NOTE 37, DISORDERS OF SPINE WITH NEUROLOGIC IMPAIRMENT
Lines 374,545
Diagnoses are included on Line 374 when neurologic impairment or radiculopathy is present, as defined as:
A) Markedly abnormal reflexes
B) Segmental muscle weakness
C) Segmental sensory loss
D) EMG or NCV evidence of nerve root impingement
E) Cauda equina syndrome,
F) Neurogenic bowel or bladder
G) Long tract abnormalities
Otherwise, disorders of spine not meeting these criteria (e.g. pain alone) fall on Line 545.

GUIDELINE NOTE 92, ACUPUNCTURE
Lines 1,207,374,414,468,545,546
Inclusion of acupuncture (CPT 97810-97814) on the Prioritized List has the following limitations:

Line 1 PREGNANCY
Acupuncture pairs on Line 1 for the following conditions and codes.
Hyperemesis gravidarum
ICD-10-CM code: O21.0, O21.1
Acupuncture pairs with hyperemesis gravidarum when a diagnosis is made by the maternity care provider and referred for acupuncture treatment for up to 2 sessions of acupressure/acupuncture.
Breech presentation
ICD-10-CM code: O32.1xx0, O32.8xx0
Acupuncture (and moxibustion) is paired with breech presentation when a referral with a diagnosis of breech presentation is made by the maternity care provider, the patient is between 33 and 38 weeks gestation, for up to 2 visits.
Back and pelvic pain of pregnancy
ICD-10-CM code: O33.0
Acupuncture is paired with back and pelvic pain of pregnancy when referred by maternity care provider/primary care provider for up to 12 sessions.
Line 207 DEPRESSION AND OTHER MOOD DISORDERS, MILD OR MODERATE

Acupuncture is paired with the treatment of post-stroke depression only. Treatments may be billed to a maximum of 30 minutes face-to-face time and limited to 15 total sessions, with documentation of meaningful improvement.

Line 374 DISORDERS OF SPINE WITH NEUROLOGIC IMPAIRMENT

Acupuncture is included on Line 374 only for pairing with disorders of the spine with myelopathy and/or radiculopathy represented by the diagnosis codes G83.4, M47.1x, M47.2x, M50.0x, M50.1x, M51.1x, M54.1x, with referral, for up to 12 sessions.

Line 414 MIGRAINE HEADACHES

Acupuncture pairs on Line 414 for ICD-10-CM code G43.9 Migraine, when referred, for up to 12 sessions.

Line 468 OSTEOARTHRITIS AND ALLIED DISORDERS

Acupuncture pairs on Line 468 for osteoarthritis of the knee only, when referred, for up to 12 sessions.

Line 545 ACUTE AND CHRONIC DISORDERS OF SPINE WITHOUT NEUROLOGIC IMPAIRMENT

Acupuncture pairs on Line 545 with the low back diagnoses G83.4, M47.1x, M47.2x, M50.0x, M50.1x, M51.1x, M54.1x, when referred, for up to 12 sessions. Acupuncture pairs with chronic (>90 days) neck pain diagnoses (), when referred, for up to 12 sessions.

Line 546 TENSION HEADACHES

Acupuncture is included on Line 546 for treatment of tension headaches G44.2x, when referred, for up to 12 sessions.

GUIDELINE NOTE 94, EVALUATION AND MANAGEMENT OF LOW BACK PAIN

Lines 374,545

Procedures for the evaluation and management of low back pain are included on these lines when provided subject to the State of Oregon Evidence-based Clinical Guidelines dated 10/2011 located at: http://www.oregon.gov/oha/OHPR/pages/herc/evidence-based-guidelines.aspx.

GUIDELINE NOTE 101, ARTIFICIAL DISC REPLACEMENT

Lines 374,545

Artificial disc replacement (CPT 22856-22865) is included on these lines as an alternative to fusion only when all of the following criteria are met:

Lumbar artificial disc replacement

1) Patients must first complete a structured, intensive, multi-disciplinary program for management of pain, if covered by the agency;
2) Patients must be 60 years or under;
3) Patients must meet FDA approved indications for use and not have any contraindications. FDA approval is device specific but includes:
   - Failure of at least six months of conservative treatment
   - Skeletally mature patient
   - Replacement of a single disc for degenerative disc disease at one level confirmed by patient history and imaging

Cervical artificial disc replacement

1) Patients must meet FDA approved indications for use and not have any contraindications. FDA approval is device specific but includes:
   - Skeletally mature patient
   - Reconstruction of a single disc following single level discectomy for intractable symptomatic cervical disc disease (radiculopathy or myelopathy) confirmed by patient findings and imaging.

GUIDELINE NOTE 105, EPIDURAL STEROID INJECTIONS, OTHER PERCUTANEOUS INTERVENTIONS FOR LOW BACK PAIN

Lines 50,374,412,545,588,616

Epidural steroid injections (CPT 62311, 64483, 64484) are covered for patients with persistent radiculopathy due to herniated disc, where radiculopathy is as defined in Guideline Note 37 as showing evidence of one or more of the following:

A) Markedly abnormal reflexes
B) Segmental muscle weakness
C) Segmental sensory loss
D) EMG or NCV evidence of nerve root impingement
E) Cauda equina syndrome
F) Neurogenic bowel or bladder
G) Long tract abnormalities

It is recommended that shared decision-making regarding epidural steroid injection include a specific discussion about inconsistent evidence showing moderate short-term benefits, and lack of long-term benefits. If an epidural steroid injection

does not offer benefit, repeated injections should not be covered. Epidural steroid injections are not covered for spinal stenosis or for patients with low back pain without radiculopathy.

The following interventions are not covered for low back pain, with or without radiculopathy:

- facet joint corticosteroid injection
- prolotherapy
- intradiscal corticosteroid injection
- local injections
- botulinum toxin injection
- intradiscal electrothermal therapy
- therapeutic medial branch block
- radiofrequency denervation
- sacroiliac joint steroid injection
- coblation nucleoplasty
- percutaneous intradiscal radiofrequency thermocoagulation
- radiofrequency denervation

Biennial Review: Low back pain lines

HERC guideline recommended effective treatments for low back pain:
[note: generally effective for back pain lasting more than 4 weeks]
Epidural steroid injection for low back pain with radiculopathy with herniated lumbar disc
Spinal manipulation
Exercise therapy
Massage
Acupuncture
Yoga
Cognitive-behavioral therapy
Progressive relaxation
Acetaminophen
NSAIDs
Skeletal muscle relaxants
Antidepressants (TCA)
Benzodiazepines (consider harms)
Tramadol, opioids (consider harms)
Intensive interdisciplinary rehabilitation

HERC insufficient evidence for treatment for low back pain:
Local injections
Botulinum toxin injection
Epidural steroid injection for non-radicular back pain
Therapeutic medial branch block
Radiofrequency denervation
Sacroiliac joint steroid injection
Coblation nucleoplasty
Percutaneous intradiscal radiofrequency thermocoagulation (PIRFT)
Intradiscal electrothermal therapy (IDET)
Radiofrequency denervation

HERC evidence of no benefit/harm for treatment of low back pain
Prolotherapy
Facet joint steroid injection
Intradiscal steroid injection

Biennial Review: Low back pain lines

HERC staff recommendations:

1) Create new lines for low back pain with effective treatments and low back pain without effective treatments
   a) Delete current lines 400 and 562
   b) Proposed line contents and scoring shown below
   c) No changes required to guideline notes 37, 92, 94, 101 or 105
2) Discuss:
   a) Should chronic non-responsive back pain be on the lower line? If so, how should we define this? Do we need a guideline to define when a condition is on the upper or the lower line?
   b) Should a new guideline be created to limit certain types of treatments or total numbers of treatments (i.e. create a total visit limit for PT, chiropractic and acupuncture combined per year). Should such a guideline include limits on certain medications (i.e. long acting opioids)? Should such a guideline include participation in a pain management program?
   c) What about acute flares of chronic back pain?

Biennial Review: Low back pain lines

Line XXX BACK PAIN WITH EFFECTIVE TREATMENTS
Treatment: MEDICAL AND SURGICAL TREATMENT
ICD-9: [all diagnoses from lines 400 and 562 April 1 2014 List]
--not 722.3x, 723.5, 723.6, 723.7, 723.8, 723.9, 724.7x, 739.x, 754.1 from 562—only on lower line
--move from line 434 (some on 607): 721.1, 721.4x, 721.91, 723.0, 724.0x
--move from line 607: 756.11, 756.12
--move from line 638: none
ICD-10: [all diagnoses from lines 374 and 545 on October 1 2014 List]
--not M51.4x, M54.0x from 545—only on lower line
--move from line 412 (some also on 588): M43.8xx, M43.9, M47.1x, M48.0x, M99.2x-M99.7x
--move from line 588: M43.0x, M43.1x, M99.83, M99.84, Q76,2
--move from line 616: S33.6xxx, S33.8xxx, S39.012x
CPT: 20660-20662,20665,20930-20938,22532-22819,22840-22865,62287, 62311,62355,62365-63091,63170-63200,63270-63273,63295-63610,63650, 63655,63685,64400-64455,64483,64484,64505-64530, 90804-90822, 95990, 96150-96154,97001-97004,97022,97110-97124,97140-97530,97535,97542, 97760-97762,97810-98942,98966-98969,99051,99060,99070,99078,99201-99239,99281-99285,99291-99404,99408-99412,99429-99449,99471-99476, 99487-99496,99605-99607
--all from line 400, plus 90804-90822 (psychotherapy)
HCPCS: G0157-G0161,G0396,G0397,G0406-G0408,G0425-G0427, G0463, S2350, S2351
--all from line 400

<u>Scoring for LBP with Effective Treatments (current scoring for upper LBP line in parentheses)</u>
Category : 7 (7)
HL: 5 (5)
Suffering: 3 (3)
Population effects: 0 (0)
Vulnerable population: 0 (0)
Tertiary prevention: 2 (2)
Effectiveness: 4 (3)
Need for service: 0.9 (1)
Net cost: 2 (2)
Score: 720
Approximate line placement: 379

Line XXX BACK PAIN WITH NON-EFFECTIVE TREATMENTS; CHRONIC NON-RESPONSIVE BACK PAIN

Treatment: MEDICAL AND SURGICAL TREATMENT

ICD-9: [all diagnoses from lines 400 and 562 April 1 2014 List]

--move from line 434 (some on 607): 721.1, 721.4x, 721.91, 723.0, 724.0x

--move from line 607: 756.11, 756.12

--move from line 638: none

ICD-10: [all diagnoses from lines 374 and 545 on October 1 2014 List]

--move from line 412 (some also on 588): M43.8xx, M43.9, M47.1x, M48.0x, M99.2x-M99.7x

--move from line 588: M43.0x, M43.1x, M99.83, M99.84, Q76,2

--move from line 616: S33.6xxx, S33.8xxx, S39.012x

CPT: 20552, 20553, 20600, 22520-22525, 22526, 22527, 22856-22865, 27096, 62290-62292, 62311, 62355, 62365-63091,63170-63200,63270-63273,63295-63610,63650,63655,63685,64400-64455, 64483, 64484, 64490-64495, 64635, 64636, 72295, 95990,96150-96154,97001-97004,97022,97110-97124,97140-97530,97535,97542,97760-97762,97810-98942,98966-98969,99051,99060, 99070,99078,99201-99239,99281-99285,99291-99404,99408-99412,99429-99449,99471-99476,99487-99496,99605-99607

--ineffective/insufficient information treatments from low back pain coverage guidances plus back surgery, office visit/outpatient and inpatient codes

HCPCS: G0157-G0161,G0396,G0397,G0406-G0408,G0425-G0427,G0463, M0076, S2348, S2360, S2361

--ineffective/insufficient information treatments from low back pain coverage guidances as well as medical HCPCS from line 400

<u>Scoring for LBP with Non-Effective Treatments; Chronic non responsive back pain (current scoring for lower LBP line in parentheses)</u>

Category :7 (7)
HL: 5 (4)
Suffering: 3 (2)
Population effects: 0 (0)
Vulnerable population: 0 (0)
Tertiary prevention: 0 (0)
Effectiveness: 1 (1)
Need for service: 0.5 (0.8)
Net cost: 2 (2)
Score: 80
Approximate line placement: 550

State of Oregon Evidence-based Clinical Guidelines Project

Evaluation and Management of Low Back Pain

A Clinical Practice Guideline Based on the Joint Practice Guideline of the American College of Physicians and the American Pain Society (Diagnosis and Treatment of Low Back Pain)

October 2011

Oregon Health Authority

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Objective

This guideline was developed by a collaborative group of public and private partners to provide up-to-date evidence-based guidance on the evaluation and management of low back pain. The purpose of this guideline is to assist licensed clinicians, working within their scope of practice in the State of Oregon, in the assessment and management of low back pain among non-pregnant adults. Implementation of recommendations in this guideline will be determined by individual health plans and providers.

Background

In June 2009, the Oregon legislature passed health reform legislation, HB 2009, which created the Oregon Health Policy Board and charged it with creating a comprehensive health reform plan for our state. In December 2010, the Board released *Oregon's Action Plan for Health*, which lays out "strategies that reflect the urgency of the health care crisis and a timeline for actions that will lead Oregon to a more affordable, world-class health care system." They outlined eight foundational strategies, one of which is to "set standards for safe and effective care." To accomplish this, the plan directs the state to "Identify and develop 10 sets of Oregon-based best practice guidelines and standards that can be uniformly applied across public and private health care to drive down costs and reduce unnecessary care. This work will be conducted by the Health Services Commission and Health Resources Commission in close collaboration with providers, the Center for Evidence-Based Practice, and other key stakeholders." [1]

During the same time period when this guideline was under development by the State of Oregon, the Oregon Healthcare Leadership Council and the Oregon Health Care Quality Corporation both independently began pursuing the development of practice guidelines that could be used across the state, and the value of collaboration became apparent. The three entities agreed to develop the first guideline together, and in the fall of 2010, selected Evaluation and Management of Low Back Pain as their first guideline topic. Representatives from the three organizations formed the Guideline Development Group (GDG), while clinical evidence specialists from the Center for Evidence-based Policy provided expertise and research to support guideline development.

Methods

The GDG was guided in developing this guideline by the ADAPTÉ[2] framework which is a systematic approach to the endorsement or modification of guideline(s) produced in one cultural context or organization setting for application in another context. Guideline adaptation is used as an alternative to wholly new guideline development, which is time consuming, expensive and an inefficient use of resources, when quality guidelines are available.

The process for developing this guideline began by searching 17 different databases and other sources for guidelines related to Acute Low Back Pain (see appendix A). Candidate guidelines were required to be evidence-based (recommendations based on a systematic review of the literature), address the comprehensive clinical management of adults with an acute episode of low back pain, be published in English and be widely available. By "comprehensive," the GDG meant that the guideline would include recommendations on the initial assessment of a patient with a new episode of low back pain, the use of both pharmacologic and nonpharmacologic therapies and the appropriate ongoing management of

[1] Effective January 1, 2012, House Bill 2100 (2011) terminates the Health Services Commission and Health Resources Commission and transfers their duties related to evidence-based guideline development to a new Health Evidence Review Commission.

[2] http://www.adapte.org/www/

people who experience continuing low back pain. The GDG required that evidence-based recommendations be made on the basis of both the quality and strength of the underlying data from the guideline's systematic reviews.

Thirteen candidate guidelines were identified, of which 10 were sufficiently comprehensive to address most management issues (Appendix B). Those 10 guidelines were then assessed for methodologic quality using a modified AGREE (Appraisal of Guidelines Research and Evaluation) II[3] instrument (Appendix C) by two different guideline quality assessors from the Center for Evidence-based Policy. Five of those guidelines were rated either Good quality, or Fair quality with Good rigor of development according to the modified AGREE rating tool. These five guidelines were then examined further for scope and clarity of presentation.

After considering guideline age, source, specific treatment elements addressed and presentation, the GDG selected the two guidelines of highest quality that were most comprehensive. The two selected were both good quality and completed in the last five years, whereas the other three were more than 5 years old and were rated fair quality. Of the two selected, the American College of Physicians/ American Pain Society (ACP/APS) guideline was preferred as the base guideline, primarily because it had recommendations concerning the early care of acute low back pain and contained algorithms that were felt to be useful implementation tools.

The ACP/APS guideline in its entirety can be found at the following link: http://www.annals.org/content/147/7/478.long. The ACP/APS guideline is accompanied by full systematic reviews on nonpharmacologic therapies for low back pain (http://www.annals.org/content/147/7/492.full.pdf+html) and the use of medications for low back pain (http://www.annals.org/content/147/7/505.full.pdf+html). Comparison was then made to the other high quality, comprehensive guideline, which was produced by the National Institute for Health and Clinical Excellence (NICE). The full NICE guideline and reviews of the evidence are available at the following link: http://www.nice.org.uk/CG88. There were two significant areas of difference. First, the NICE guideline does not address treatment in the first six weeks. Second, the NICE guideline excludes patients with leg pain or radiculopathy. However, there were no significant differences in other assessment or treatment recommendations between the two guidelines.

The GDG found no guidelines that focused exclusively on acute low back pain during the first 12 weeks of the episode of back pain. This is primarily because many of the studies in the field include people with back pain of longer duration. The GDG felt that the ACP/APS guideline concentrated on acute low back pain and was also able to contribute guidance toward those patients experiencing more persistent or recurrent back pain. For this reason, the GDG decided to change the focus of the guideline to the evaluation and management of low back pain, regardless of duration. Figure 1 & 2 of the guideline are an algorithm that addresses the initial assessment and management of low back pain, as well as provides management options including both pharmacologic and nonpharmacologic interventions.

The ACP/APS guideline used the ACP's guideline grading system that was adapted from the Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) working group. Guideline recommendations were rated as either strong or weak. Strong recommendations were required to have clear evidence of benefit or harm. Weak recommendations were based on finely balanced benefits, risks and burdens. The overall strength of evidence for each intervention was rated based on factors such as

[3] http://www.agreecollaboration.org/

the quality, quantity, consistency, generalizability and directness of the evidence. The ACP/APS guideline panel considered interventions to have "proven" benefit if there was at least fair quality evidence of moderate or substantial benefit (or of small benefit with no significant harms, costs or burdens).

Updating
The ACP/APS guideline was published in 2007. The authors of the guideline were contacted in March 2011 and stated that there had been no new published evidence which would change the recommendations of the guideline and that it was considered current. The GDG recommends that this guideline be reevaluated if the ACP/APS issues an updated guideline and at least every two years for currency if the original guideline is not updated.

Recommendations

Below are the recommendations of the ACP/APS clinical practice guideline. The GDG found that all of these recommendations apply to the objectives and purposes stated above. The recommendations relate to the algorithm which follows (Figure 1 and Figure 2 from the guideline publication) and the algorithm makes reference to the specific numbered guideline recommendations below. Recommendations 2, 3 and 4 are further supported by a systematic review and meta-analysis of imaging strategies published in 2009[4], as well as Best Practice Advice from the American College of Physicians published in 2011[5].

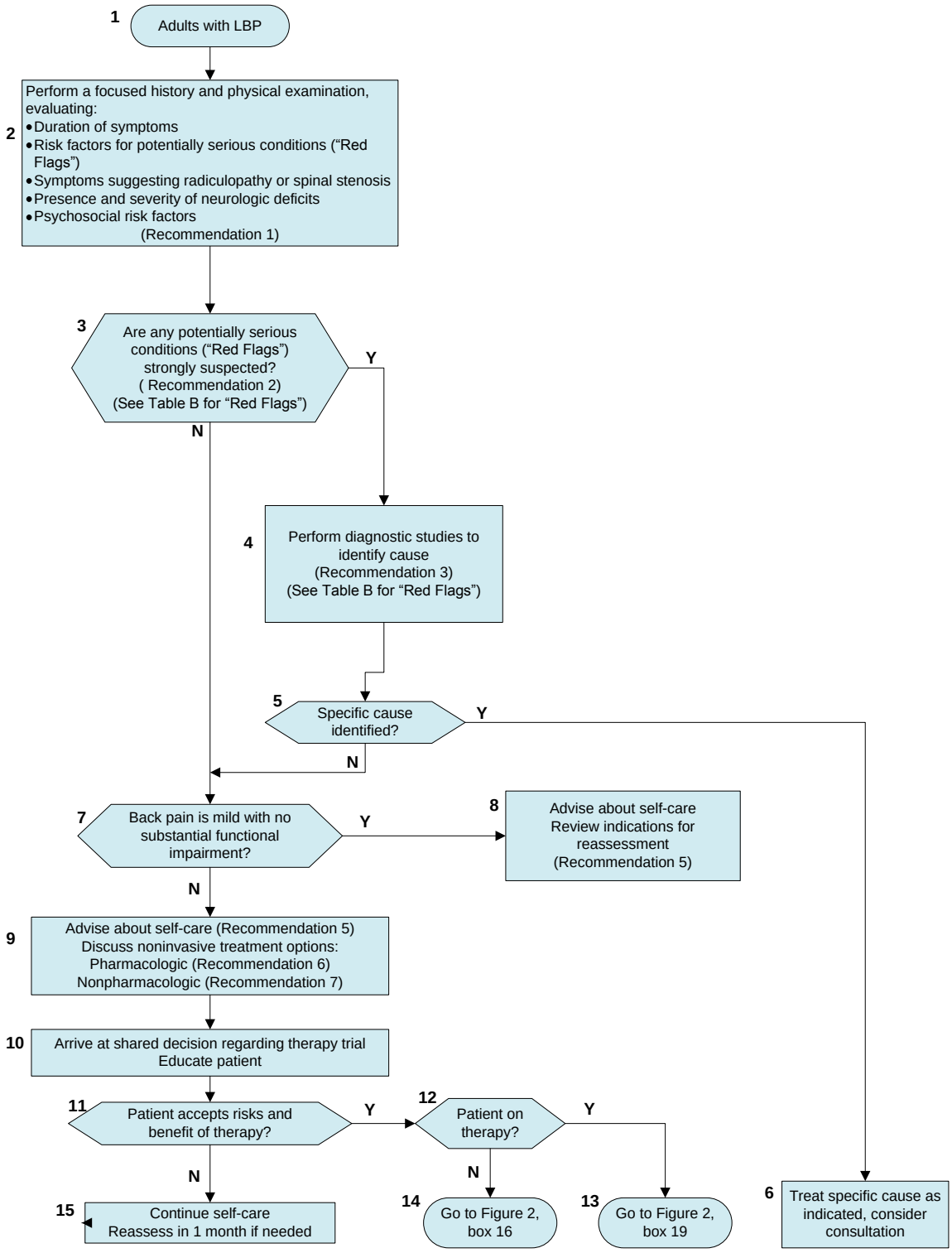
Table A: State of Oregon Evidence-based Clinical Guideline Recommendations for the Management of Low Back Pain

Recommendations		
Recommendation	**Content**	**Strength of Recommendation & Evidence Grade**
1. Focused History & Physical	Clinicians should conduct a focused history and physical examination, including a neurological exam, to help place patients with low back pain into 1 of 3 broad categories: nonspecific low back pain, back pain potentially associated with radiculopathy or spinal stenosis or back pain potentially associated with another specific spinal cause. The history should include assessment of psychosocial risk factors, which predict risk for chronic disabling back pain. *Appropriate referrals for management of potentially serious conditions (see Table B) could be considered at this time.*[6]	Recommendation: Strong Grade: Moderate-quality evidence

[4] Chou, R, Fu, R, Carrino, J & Deyo, R. (2009). Imaging strategies for low-back pain: systematic review and meta-analysis. *The Lancet,* 373(9662): 463-72.
[5] Chou, R, Qaseem, A, Owens, D, Shekelle, P for the Clinical Guidelines Committee of the American College of Physicians. (2011). Diagnostic imaging for low back pain: Advice for high-value health care from the American College of Physicians. *Annals of Internal Medicine,* 154(3), 181-189.
[6] Making referrals for management of psychosocial risk factors predictive of chronic disabling back pain are not supported by evidence at this time.

Recommendations		
Recommendation	**Content**	**Strength of Recommendation & Evidence Grade**
2. Routine Imaging for non-specific pain (X-ray, CT, MRI)	Clinicians ***should not*** routinely obtain imaging or other diagnostic tests in patients with nonspecific low back pain.	Recommendation: Strong Grade: Moderate-quality evidence
3. Imaging for underlying conditions present or suspected (X-ray, CT, MRI)	Clinicians should perform diagnostic imaging and testing for patients with low back pain when severe or progressive neurologic deficits are present or when serious underlying conditions are suspected on the basis of history and physical examination. (See Table B for a list of potentially serious conditions)	Recommendation: Strong Grade: Moderate-quality evidence
4. Advanced Imaging (CT, MRI)	Clinicians should evaluate patients with persistent low back pain and signs or symptoms of radiculopathy or spinal stenosis with magnetic resonance imaging (preferred) or computed tomography only if they are potential candidates for surgery or epidural steroid injection (for suspected radiculopathy).	Recommendation: Strong Grade: Moderate-quality evidence
5. Patient Education	Clinicians should provide patients with evidence-based information on low back pain with regard to their expected course, advise patients to remain active, and provide information about effective self-care options.	Recommendation: Strong Grade: Moderate-quality evidence
6. Pharmacologic therapy	For patients with low back pain, clinicians should consider the use of medications with proven benefits in conjunction with back care information and self-care. Clinicians should assess severity of baseline pain and functional deficits, potential benefits, risks, and relative lack of long-term efficacy and safety data before initiating therapy. Note: For most patients, first-line medication options are acetaminophen or non-steroidal anti-inflammatory drugs	Recommendation: Strong Grade: Moderate-quality evidence
7. Non-pharmacologic therapy	For patients who do not improve with self-care options, clinicians should consider the addition of nonpharmacologic therapy with proven benefits—for acute low back pain, spinal manipulation; for chronic or subacute low back pain, intensive interdisciplinary rehabilitation, exercise therapy, acupuncture, massage therapy, spinal manipulation, yoga, cognitive-behavioral therapy, or progressive relaxation.	Recommendation: Weak Grade: Moderate-quality evidence

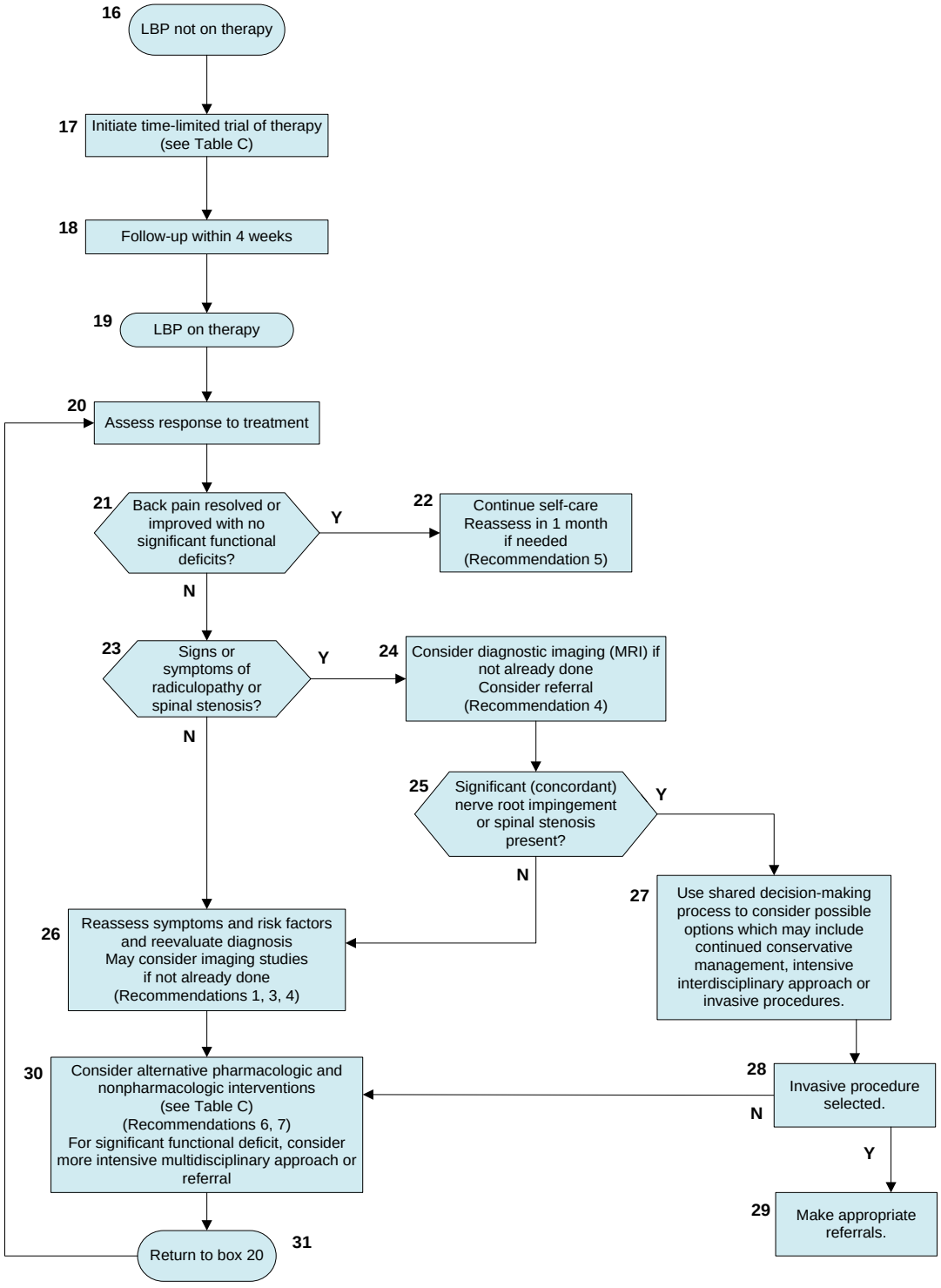
Figure 1. **Initial evaluation & management of low back pain (LBP).**



This algorithm should not be used for back pain associated with major trauma, nonspinal back pain, or back pain due to systemic illness.

Extracted and modified from Chou R, Qaseem A, Snow V, et al: Diagnosis and Treatment of Low Back Pain: A Joint Clinical Practice Guideline from the American College of Physicians and the American Pain Society. Ann Intern Med. 2007;147:478-491.

***Figure 2*. Management of low back pain (LBP).**



Extracted and modified from Chou R, Qaseem A, Snow V, et al: Diagnosis and Treatment of Low Back Pain: A Joint Clinical Practice Guideline from the American College of Physicians and the American Pain Society. Ann Intern Med. 2007;147:478-491.

Table B: Potentially Serious Conditions ("Red Flags") and Recommendations for Initial Diagnostic Work-up (Addresses Recommendations 1-4)

Possible cause	Key features on history or physical examination	Imaging*	Additional studies*
Cancer	History of cancer with new onset of LBP	MRI	ESR
	• Unexplained weight loss • Failure to improve after 1 month • Age >50 years	Lumbosacral plain radiography	
	Multiple risk factors present	Plain radiography or MRI	
Spinal column infection	• Fever • Intravenous drug use • Recent infection	MRI	ESR and/or CRP
Cauda equina syndrome	• Urinary retention • Motor deficits at multiple levels • Fecal incontinence • Saddle anesthesia	MRI	None
Vertebral compression fracture	• History of osteoporosis • Use of corticosteroids • Older age	Lumbosacral plain radiography	None
Ankylosing spondylitis	• Morning stiffness • Improvement with exercise • Alternating buttock pain • Awakening due to back pain during the second part of the night • Younger age	Anterior-posterior pelvis plain radiography	ESR and/or CRP, HLA-B27
Nerve compression /disorders (e.g. herniated disc with radiculopathy) (Recommendation 4)	• Back pain with leg pain in an L4, L5, or S1 nerve root distribution • Positive straight-leg-raise test or crossed straight-leg-raise test	None	None
	• Radiculopathic symptoms present >1 month • Severe/progressive neurologic deficits, progressive motor weakness	MRI**	Consider EMG/NCV
Spinal stenosis (Recommendation 4)	• Radiating leg pain • Older age • Pain usually relieved with sitting • (Pseudoclaudication a weak predictor)	None	None
	Spinal stenosis symptoms present >1 month	MRI**	Consider EMG/NCV

* Level of evidence for diagnostic evaluation is variable

** Only if patient is a potential candidate for surgery or epidural steroid injection

Red Flag: Red flags are findings from the history and physical examination that may be associated with a higher risk of serious disorders. CRP = C-reactive protein; EMG = electromyography; ESR = erythrocyte sedimentation rate; MRI = magnetic resonance imaging; NCV = nerve conduction velocity.

Extracted and modified from Chou R, Qaseem A, Snow V, et al: Diagnosis and Treatment of Low Back Pain: A Joint Clinical Practice Guideline from the American College of Physicians and the American Pain Society. Ann Intern Med. 2007; 147:478-491.

Table C: Interventions (Addresses Recommendations 5-7)

Intervention Category*	Intervention	Acute < 4 Weeks	Subacute & Chronic > 4 Weeks
Self-care	Advice to remain active	●	●
	Books, handout	●	●
	Application of superficial heat	●	
Nonpharmacologic therapy	Spinal manipulation	●	●
	Exercise therapy		●
	Massage		●
	Acupuncture		●
	Yoga		●
	Cognitive-behavioral therapy		●
	Progressive relaxation		●
Pharmacologic therapy (Carefully consider risks/harms)	Acetaminophen	●	●
	NSAIDs	●(▲)	●(▲)
	Skeletal muscle relaxants	●	
	Antidepressants (TCA)		●
	*Benzodiazepines***	●(▲)	●(▲)
	*Tramadol, opioids***	●(▲)	●(▲)
Interdisciplinary therapy	Intensive interdisciplinary rehabilitation		●

- Interventions supported by grade B evidence (at least fair-quality evidence of moderate benefit, or small benefit but no significant harms, costs, or burdens). No intervention was supported by grade "A" evidence (good-quality evidence of substantial benefit).

▲ *Carries greater risk of harms than other agents in table*.

NSAIDs = nonsteroidal anti-inflammatory drugs; TCA = tricyclic antidepressants.

*These are general categories only. Individual care plans need to be developed on a case by case basis. For more detailed information please see: http://www.annals.org/content/147/7/478.full.pdf

**Associated with significant risks related to potential for abuse, addiction and tolerance. This evidence evaluates effectiveness of these agents with relatively short term use studies. Chronic use of these agents may result in significant harms.

Extracted and modified from Chou R, Qaseem A, Snow V, et al: Diagnosis and Treatment of Low Back Pain: A Joint Clinical Practice Guideline from the American College of Physicians and the American Pain Society. Ann Intern Med. 2007; 147:478-491.

Appendix A. Sources Searched for Low Back Pain Guidelines

1. British Medical Journal – Clinical Evidence
2. Cochrane Library
3. Agency for Healthcare Research and Quality
4. ECRI
5. Hayes, Inc
6. Veterans Administration – Technology Assessment Program (VA TAP)
7. Blue Cross Blue Shield HTA
8. Centers for Medicare and Medicaid
9. CADTH
10. Washington HTA Program
11. US Preventive Services Task Force
12. ICSI
13. Guidelines.gov
14. American College of Physicians AND American Pain Society
15. American Physical Therapy Association
16. PEDro.org.au (evidence-based physiotherapy database)
17. GIN Guidelines Database

Appendix B. Low Back Pain Guidelines Identified

Methods Summary:
Initially, 17 databases and other sources for guidelines related to Acute Low Back Pain were searched. Candidate guidelines were required to:

- be evidence-based (recommendations based on a full systematic review)
- be comprehensive
- be published in English
- be freely available to the public

Thirteen pertinent guidelines were identified, of which 10 were sufficiently comprehensive and were assessed by two clinical epidemiologists for methodologic quality using a modified AGREE (Appraisal of Guidelines Research and Evaluation) II[7] instrument.
Candidate guidelines were then assessed considering:

- age
- source
- specific treatment elements addressed
- presentation

The GDG selected the two guidelines of highest quality that were most comprehensive. (See guideline text for comprehensive Methods discussion)

Low Back Pain Guidelines Identified in Search – Selected for Quality Assessment

American College of Occupational and Environmental Medicine (ACOEM). (2007). Low back disorders. Occupational medicine practice guidelines: Evaluation and management of common health problems and functional recovery in workers. 2nd ed. Elk Grove Village, IL: ACOEM.
Overall guideline quality rating: Fair

Chou, R., Qaseem, A., Snow, V., Casey, D., Cross, J.T. Jr., Shekelle, P., Owens, D.K., Clinical Efficacy Assessment Subcommittee of the American College of Physicians, American College of Physicians, American Pain Society Low Back Pain Guidelines Panel. (2007).Diagnosis and treatment of low back pain: A joint clinical practice guideline from the American College of Physicians and the American Pain Society. *Ann Intern Med, 147*(7), 478-91.
Overall guideline quality rating: Good

Institute for Clinical Systems Improvement (ICSI). (2010). Adult low back pain. Fourteenth edition. Bloomington, MN: ICSI.
Overall guideline quality rating: Poor

Michigan Quality Improvement Consortium. (2008). Management of acute low back pain. Southfield, MI: Michigan Quality Improvement Consortium.
Overall guideline quality rating: Poor

National Health and Medical Research Council. Australian Acute Musculoskeletal Pain Guidelines Group. (2003). Evidence-based management of acute musculoskeletal pain. (Website states that status is "current"). [Chapter 4 of document is on Acute Low Back Pain.]
http://www.nhmrc.gov.au/_files_nhmrc/file/publications/synopses /cp94.pdf
Overall guideline quality rating: Fair

National Institute for Health and Clinical Excellence (NICE). (2009). Low back pain: Early management of persistent non-specific low back pain. London, UK: National Institute for Health and Clinical Excellence. Retrieved September 30, 2010, from http://www.nice.org.uk/nicemedia/live/11887/44343/44343.pdf
Overall guideline quality rating: Good

[7] http://www.agreecollaboration.org/

New Zealand Guidelines Group. (2004). New Zealand acute low back pain guide. Wellington, NZ: New Zealand Guidelines Group. Retrieved December 13, 2010, from http://www.nzgg.org.nz/guidelines/0072/acc1038_col.pdf
Overall guideline quality rating: Fair

Philadelphia Panel. (2001). Philadelphia Panel evidence-based clinical practice guidelines on selected rehabilitation interventions for low back pain. *Physical Therapy, 81*(10), 1641-74.
Overall guideline quality rating: Fair

Towards Optimized Practice. (2009). Management of low back pain. Edmonton, AB: Towards Optimized Practice Program.
Overall guideline quality rating: Fair

University of Michigan Health System. (2010). Acute low back pain. Ann Arbor, MI: University of Michigan Health System.
Overall guideline quality rating: Poor

Low Back Pain Guidelines Identified in Search– Not Selected for Quality Assessment

Burton, A.K., Müller, G., Balagué, F., Gardon, G., Eriksen, H.R., Hänninen, O., et al. (2004). European guidelines for prevention in low back pain. Retrieved November 22, 2010, from http://www.backpaineurope.org/web/files/WG3_Guidelines.pdf
Reason for exclusion: Age of underlying evidence review

Davis, P.C., Wippold, F.J. II, Brunberg, J.A., Cornelius, R.S., De La Paz, R.L., Dormont, D., Gray, L, Jordan, J.E., Mukherji, S.K., Seidenwurm, D.J., Turski, P.A., Zimmerman, R.D., Sloan, M.A., Expert Panel on Neurologic Imaging. (2008). ACR Appropriateness Criteria ® low back pain. Reston, VA: American College of Radiology (ACR).
Reason for exclusion: Specific treatment elements not addressed

Globe, G.A., Morris, C.E., Whalen, W.M., Farabaugh, R.J., Hawk, C, Council on Chiropractic Guidelines and Practice Parameter. (2008) Chiropractic management of low back disorders: Report from a consensus process. *Journal of Manipulative Physiological Therapy, 31*(9), 651-8.
Reason for exclusion: Specific treatment elements not addressed

McIntosh, G., & Hall, H. (2007). Low back pain (acute). *BMJ Clinical Evidence, 10*, 1102-1131.
Reason for exclusion: Not a guideline

Resnick, D.K., Choudhri, T.F., Dailey, A.T., Groff, M.W., Khoo, L., Matz, P.G., Mummaneni, P., Watters, W.C. 3rd, Wang, J., Walters, B.C., Hadley, M.N., American Association of Neurological Surgeons/Congress of Neurological Surgeons. (2005). Guidelines for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 2: Assessment of functional outcome. *Journal of Neurosurgery: Spine, 2*(6), 639-46.
Reason for exclusion: Specific treatment elements not addressed

US Preventive Services Task Force (USPSTF). (2004). Primary care interventions to prevent low back pain in adults. Rockville, MD: USPSTF.
Reason for exclusion: Recommendations pertain to prevention, not diagnosis or management

Work Loss Data Institute (WLDI). (2008). Low back - lumbar & thoracic (acute & chronic). Corpus Christi, TX: WLDI. Retrieved November 22, 2010, from http://guidelines.gov/content.aspx?id=12674 [Full version for purchase only]
Reason for exclusion: Not freely available to the public

Appendix C: Methodology Checklist Adapted from the AGREE II materials

Methodology Checklist: Guidelines			
Guideline citation *(Include name of organization, title, year of publication, journal title, pages)*			
Guideline Topic:			
Checklist completed by:		Date:	
SECTION 1: PRIMARY CRITERIA			
To what extent is there		***Assessment/Comments:***	
1.1	**RIGOR OF DEVELOPMENT: Evidence** • Systematic literature search • Study selection criteria clearly described • Quality of individual studies and overall strength of the evidence assessed • Explicit link between evidence & recommendations *(If any of the above are missing, rate as poor)*	GOOD	FAIR POOR
1.2	**RIGOR OF DEVELOPMENT: Recommendations** • Methods for developing recommendations clearly described • Strengths and limitations of evidence clearly described • Benefits/side effects/risks considered • External review	GOOD	FAIR POOR
1.3	**EDITORIAL INDEPENDENCE**[8] • Views of funding body have not influenced the content of the guideline • Competing interests of members have been recorded and addressed	GOOD	FAIR POOR
If any of three primary criteria are rated poor, the entire guideline should be rated poor.			
SECTION 2: SECONDARY CRITERIA			
2.1	**SCOPE AND PURPOSE** • Objectives described • Health question(s) specifically described • Population (patients, public, etc.) specified	GOOD	FAIR POOR

[8] Editorial Independence is a critical domain. However, it is often very poorly reported in guidelines. The assessor should not rate the domain, but write "unable to assess" in the comment section. If the editorial independence is rated as "poor", indicating a high likelihood of bias, the entire guideline should be assessed as poor.

SECTION 2: SECONDARY CRITERIA, Cont.		
2.2	**STAKEHOLDER INVOLVEMENT** • Relevant professional groups represented • Views and preferences of target population sought • Target users defined	GOOD FAIR POOR
2.3	**CLARITY AND PRESENTATION** • Recommendations specific, unambiguous • Management options clearly presented • Key recommendations identifiable • Application tools available • Updating procedure specified	GOOD FAIR POOR
2.4	**APPLICABILITY** • Provides advice and/or tools on how the recommendation(s) can be put into practice • Description of facilitators and barriers to its application • Potential resource implications considered • Monitoring/audit/review criteria presented	GOOD FAIR POOR
SECTION 3: OVERALL ASSESSMENT OF THE GUIDELINE		
3.1	How well done is this guideline?	GOOD FAIR POOR
3.2	Other reviewer comments:	

Description of Ratings: Methodology Checklist for Guidelines

The checklist for rating guidelines is organized to emphasize the use of evidence in developing guidelines and the philosophy that "evidence is global, guidelines are local." This philosophy recognizes the unique situations (e.g., differences in resources, populations) that different organizations may face in developing guidelines for their constituents. The second area of emphasis is transparency. Guideline developers should be clear about how they arrived at a recommendation and to what extent there was potential for bias in their recommendations. For these reasons, rating descriptions are only provided for the primary criteria in section one. There may be variation in how individuals might apply the good, fair, and poor ratings in section two based on their needs, resources, organizations, etc.

Section 1. Primary Criteria (rigor of development and editorial independence) ratings:

Good: All items listed are present, well described, and well executed (e.g., key research references are included for each recommendation).
Fair: All items are present, but may not be well described or well executed.
Poor: One or more items are absent or are poorly conducted

Appendix D. List of External Reviewers

Invited: Accepted & Reviewed

Susan Bamberger, PT, DIP MDT
President
Oregon Physical Therapy Association

Roger Chou, MD
Scientific Director
Oregon Evidence-based Practice Center
Oregon Health & Science University

Rick Deyo, MD, MPH
Kaiser Permanente Professor of Evidence-Based Family Medicine
Director, KL2 Multidisciplinary Clinical Research Career Development Program
Director, OCTRI Community and Practice-based Research Program
Departments of Family Medicine and Internal Medicine
Oregon Health & Science University

Dorothy Epstein, DPT, OCS
Physical Therapist
Legacy Good Samaritan Pain Management Center
Legacy Good Samaritan Outpatient Rehabilitation

Marc Gosselin, MD
Associate Professor
Director, Thoracic Imaging
Department of Diagnostic Radiology
Oregon Health & Science University

Mitch Haas, DC, MA
Associate Vice President of Research
University of Western States

Luci Kovacevic, MD, MPH
Occupational Medicine Physician
Cascade Medical Associates

Invited: Declined/Did Not Respond/Did Not Review

Thirteen additional reviewers were invited but either declined, did not respond, missed the deadline or did not return the review. Areas of professional expertise for invited reviewers included:

Behavioral Health
Complementary and Alternative Medicine
Family Medicine
Internal Medicine
Occupational Medicine
Orthopedic Surgery
Neurosurgery
Pain Advocacy
Physical Therapy
Physical Medicine and Rehabilitation
Sports Medicine
Worker's Compensation

State of Oregon Evidence-based Clinical Guidelines Project

Percutaneous Interventions for Low Back Pain

A clinical practice guideline based on the 2009 American Pain Society Guideline (Interventional Therapies, Surgery, and Interdisciplinary Rehabilitation for Low Back Pain)

June 2012

Oregon Health Authority

Guideline Development Group

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Alison Little, MD, MPH; Valerie King, MD, MPH; Catherine Pettinari, PhD; Aasta Thielke, MPH; Mellisa Pensa, MD, MPH; Shannon Vandegriff, BA; Cathy Gordon, MPH
Center for Evidence-based Policy, Oregon Health & Science University

Suggested Citation

Livingston, C., Little, A., King, V., Pettinari, C., Thielke, A., Pensa, M., Vandegriff, S., & Gordon, C. (2012). *State of Oregon Evidence-based Clinical Guidelines Project. Percutaneous interventions for low back pain: A clinical practice guideline based on the 2009 American Pain Society Guideline (Interventional Therapies, Surgery, and Interdisciplinary Rehabilitation for Low Back Pain).* Salem: Office for Oregon Health Policy and Research. Available at: http://www.oregon.gov/OHA/OHPR/HERC/Evidence-Based-Guidelines.shtml

Objective

This guideline was developed by a collaborative group of public and private partners to provide up-to-date evidence-based guidance on the role of percutaneous interventions in low back pain. The aim of the guideline is to identify evidence-based, appropriate indications for the use of percutaneous interventions in patients with low back pain of any duration, with and without leg pain. This guideline can then be used to create practice standards and coverage guidelines for use across public and private payers. It does not address patients with back pain associated with major trauma, tumor, metabolic disease, inflammatory back disease, fracture, dislocation, major instability or deformity, progressive or severe neurologic deficits, or back pain in children, adolescents or pregnant women. Percutaneous interventions addressed in this guideline include intradiscal, facet joint, sacroiliac joint and epidural steroid injections, prolotherapy, botulinum toxin injections, local injections, medial branch block, radiofrequency denervation, intradiscal electrothermal therapy, percutaneous intradiscal radiofrequency thermocoagulation and coblation nucleoplasty.

Additional evidence concerning other elements of evaluation as well as recommendations for management of low back pain can be found in the State of Oregon Evidence-based Clinical Guidelines:

- Evaluation and Management of Low Back Pain[1]
- Advanced Imaging for Low Back Pain[2]

Background

In June 2009, the Oregon legislature passed health reform legislation HB 2009, which created the Oregon Health Policy Board and charged it with creating a comprehensive health reform plan for our state. In December 2010, the Board released *Oregon's Action Plan for Health*, which lays out "strategies that reflect the urgency of the health care crisis and a timeline for actions that will lead Oregon to a more affordable, world-class health care system." They outlined eight foundational strategies, one of which is to "set standards for safe and effective care." To accomplish this, the plan directs the state to "Identify and develop 10 sets of Oregon-based best practice guidelines and standards that can be uniformly applied across public and private health care to drive down costs and reduce unnecessary care." This work is being conducted by the Oregon Health Services Commission and the Oregon Health Resources Commission in close collaboration with providers, the Center for Evidence-Based Policy, and other key stakeholders.[3]

Development of this guideline:

This guideline was developed by a Guideline Development Group (GDG) consisting of representatives from the State of Oregon Health Authority, the Oregon Healthcare Leadership Council, and the Oregon Corporation for Healthcare Quality with support from clinical evidence specialists from the Center for

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[1] Livingston, C., King, V., Little, A., Pettinari, C., Thielke, A., & Gordon, C. (2011). *State of Oregon Evidence-based Clinical Guidelines Project. Evaluation and management of low back pain: A clinical practice guideline based on the joint practice guideline of the American College of Physicians and the American Pain Society (Diagnosis and treatment of low back pain).* Salem: Office for Oregon Health Policy and Research.

[2] Livingston, C., Little, A., King, V., Pettinari, C., Thielke, A., Vandegriff, S., & Gordon, C. (2012). *State of Oregon Evidence-based Clinical Guidelines Project. Advanced imaging for low back pain: A clinical practice guideline based on the joint practice guideline of the American College of Physicians and the American Pain Society (Diagnosis and treatment of low back pain).* Salem: Office for Oregon Health Policy & Research.

[3] Effective January 1, 2012, House Bill 2100 (2011) terminates the Health Services Commission and Health Resources Commission and transfers their duties related to evidence-based guideline development to a new Health Evidence Review Commission.

Evidence-based Policy. The Center provided expertise in the process of guideline development and undertook analysis and appraisal to support the development of this guideline.

Methods:
The GDG developed this guideline using the ADAPTÉ[4] framework which is a systematic approach to the endorsement or modification of guideline(s) produced in one cultural context or organizational setting for application in another context. Guideline adaptation is used as an alternative to wholly new guideline development, which can be time consuming, expensive and an inefficient use of resources, when existing quality guidelines are available.

The process for developing this guideline began by searching 17 different databases and other sources for guidelines related to percutaneous interventions for chronic back pain (see appendix A). Candidate guidelines were required to satisfy the following requirements:

- to be evidence-based, that is, guideline recommendations are based on systematic reviews of the literature,
- to address the use of percutaneous interventions in adults with chronic back pain,
- to be published in English and,
- to be freely available to the public.

The GDG required that evidence-based recommendations be made on the basis of both the quality and strength of the underlying evidence from any included guideline's systematic reviews. The initial search identified 10 candidate guidelines which met the above stated criteria (Appendix B). Of the original candidate guidelines, three had been rated as poor quality during the development of a previous guideline and one was excluded because it was not publically available. The six remaining guidelines were then assessed for methodologic quality using a modified AGREE (Appraisal of Guidelines Research and Evaluation) II[5] instrument (Appendix C) by two different guideline quality assessors from the Center for Evidence-based Policy. Two of those guidelines were rated good quality, and one was rated fair with good rigor of development of the evidence and recommendations according to the modified AGREE rating tool. These three guidelines were then examined further for scope and clarity of presentation.

Comparison of the APS guideline was made to the other high quality, comprehensive guidelines, which were produced by the National Institute for Health and Clinical Excellence (NICE), and Towards Optimized Practice, Alberta Clinical Guidelines Program. Of the guidelines considered for review, the GDG felt that the APS guideline was the most comprehensive.

After considering guideline scope and specific modalities addressed, the GDG selected the American Pain Society's 2009 guideline "Interventional therapies, surgery, and interdisciplinary rehabilitation for low back pain: An evidence-based clinical practice guideline from the American Pain Society" as the base guideline, primarily because it had recommendations concerning a broader range of interventions than guidelines from the National Institute for Health and Clinical Evidence (NICE) or from Towards Optimized Practice (TOP). (See Appendix E for procedures addressed in the APS guideline.)

[4] http://www.adapte.org/www/
[5] http://www.agreecollaboration.org/

The APS guideline in its entirety can be found at the following link: http://journals.lww.com/spinejournal/Abstract/2009/05010/Interventional_Therapies,_Surgery,_and.14.aspx. The APS guideline is accompanied by a full systematic review on nonsurgical interventional therapies for low back pain in the same journal issue at: http://www.ampainsoc.org/library/pdf/LBPEvidRev.pdf.

The APS guideline panel arrived at treatment recommendations by first evaluating the evidence for treatments according to a system adapted from the US Preventive Services Task Force for grading the evidence, then estimating the magnitude of effects, including whether the benefits of the treatment outweigh the harms. (See Appendix D for the APS criteria for arriving at recommendations.)

Updating:
The APS guideline was published in 2009. The authors of the guideline were contacted in March 2011 and stated that there had been no new published evidence which would change the recommendations of the guideline and that it was considered current. The GDG recommends that this guideline be reevaluated if the APS issues an updated guideline and at least every two years for currency if the original guideline is not updated.

Recommendations

Below are the recommendations of the APS clinical practice guideline followed by discussion of each recommendation.

Table A. State of Oregon Evidence-based Clinical Guideline Recommendations for Percutaneous Injections of the Spine

Condition	Intervention	Net Benefit	Recommendation	Strength of Recommendation and Quality of Evidence Rating*
Non-radicular Low Back Pain				
Non-specific Low Back Pain	• Prolotherapy	No net benefit	In patients with persistent nonradicular low back pain, **clinicians should not** provide prolotherapy.	Recommendation: Strong Grade: High-quality evidence
	• Local injections • Botulinum toxin injection • Epidural steroid injection • Therapeutic medial branch block • Radiofrequency denervation • Sacroiliac joint steroid injection • Coblation nucleoplasty	Unknown	In patients with persistent nonradicular low back pain, there is insufficient evidence to adequately evaluate the benefits of local injections, botulinum toxic injection, epidural steroid injection, therapeutic medial branch block, radiofrequency denervation, sacroiliac joint steroid injection, or coblation nucleoplasty.	Insufficient evidence to determine net benefits or harms

Condition	Intervention	Net Benefit	Recommendation	Strength of Recommendation and Quality of Evidence Rating*
Presumed discogenic pain	• Intradiscal steroid injection	No net benefit	In patients with presumed discogenic pain, **clinicians should not** provide intradiscal steroid injection.	Recommendation: Strong Grade: High quality-evidence
	• Percutaneous intradiscal radiofrequency thermocoagulation (PIRFT) • Intradiscal electrothermal therapy (IDET)	Unknown	In patients with presumed discogenic pain, there is insufficient evidence to adequately evaluate the benefits of PIRFT or IDET	Insufficient evidence to determine net benefits or harms
Presumed facet joint pain	• Facet joint steroid injection	No net benefit	In patients with presumed facet joint pain, **clinicians should not** provide facet joint steroid injection.	Recommendation: Strong Grade: Moderate-quality evidence
	• Radiofrequency denervation	Unknown	In patients with presumed facet joint pain, there is insufficient evidence to adequately evaluate the benefits of radiofrequency denervation.	Insufficient evidence to determine net benefits or harms
Presumed sacroiliac joint pain	• Sacroiliac joint steroid injection	Unknown	In patients with presumed sacroiliac joint pain, there is insufficient evidence to adequately evaluate the benefits of sacroiliac joint steroid injection.	Insufficient evidence to determine net benefits or harms
Radiculopathy or Spinal Stenosis				
Radiculopathy with herniated lumbar disc	• Epidural steroid injection	**Moderate benefit (short-term)**	In patients with persistent radiculopathy due to herniated lumbar disc, **clinicians should** discuss the risks and benefits of epidural steroid injections as an option. It is recommended that Shared decision-making regarding epidural steroid injection includes a specific discussion about inconsistent evidence showing moderate short-term benefits and lack of long-term benefits.	Recommendation: Weak Grade: Moderate-quality evidence

Condition	Intervention	Net Benefit	Recommendation	Strength of Recommendation and Quality of Evidence Rating*
Radiculopathy with herniated lumbar disc, cont.	• Coblation nucleoplasty	Unknown	In patients with radiculopathy with herniated lumbar disc, there is insufficient evidence to adequately evaluate the benefits.	Insufficient evidence to determine net benefits or harms
Radiculopathy	• Radiofrequency denervation	Unknown	In patients with radiculopathy, there is insufficient evidence to adequately evaluate the benefits.	Insufficient evidence to determine net benefits or harms
Symptomatic Spinal Stenosis	• Epidural steroid injection	Unknown	In patients with spinal stenosis, there is insufficient evidence to adequately evaluate the benefits.	Insufficient evidence to determine net benefits or harms

***See Appendix D for complete description of APS and ACP evidence grading methods. Chou, et al. (2009) utilize the US Prevent Services Task Force criteria for rating the strength of recommendation and quality of evidence. Recommendations in this table are modified to fit GRADE terminology for consistency among State of Oregon guidelines.**

Recommendation #1[6]:

Epidural Steroid Injection for persistent radiculopathy due to herniated lumbar disc

> *In patients with persistent radiculopathy due to herniated lumbar disc, it is recommended that clinicians discuss risks and benefits of epidural steroid injection as an option (weak recommendation, moderate-quality evidence). It is recommended that shared decision-making regarding epidural steroid injection include a specific discussion about inconsistent evidence showing moderate short-term benefits, and lack of long-term benefits. There is insufficient evidence to adequately evaluate benefits and harms of epidural steroid injection for spinal stenosis.*

For radiculopathy due to herniated lumbar disc, evidence on benefits of epidural steroid injection is mixed. Although some higher-quality trials (Arden 2005; Bush 1991; Dilke 1973; Wilson-MacDonald 2005) found epidural steroid injection associated with moderate short-term (through up to 6 weeks) benefits in pain or function, others (Carette 1997; Karppinen 2001; Ng 2005) found no differences *versus* placebo injection. Reasons for the discrepancies between trials is uncertain, but could be related to the type of comparator treatment, as trials (Beliveau 1971; Breivik 1976; Bush 1991; Carette 1997; Cuckler 1985; Karppinen 2001; Klenerman 1984; Ng 2005; Rogers 1992; Snoek 1977; Zahaar 1991) that compared an epidural steroid injection to an epidural saline or local anesthetic injection tended to report poorer results than trials (Arden 2005; Dilke 1973; Helliwell 1985; Mathews 1987; Ridley 1988; Wilson-MacDonald 2005) that compared an epidural steroid injection to a soft-tissue (usually interspinous ligament) placebo injection. Regardless of the comparator intervention, there is no

[6] Extracted and modified from Chou, et. al. (2009)

convincing evidence that epidural steroids are associated with long-term benefits and most trials (Arden 2005; Carette 1997; Riew 2000; Wilson-MacDonald 2005) found no reduction in rates of subsequent surgery. Although serious complications following epidural steroid injection are rare in clinical trials, (Arden 2005; Karppinen 2001; Kolsi 2000; Kraemer 1997; Ng 2005) there are case reports of paralysis and infections. (Glaser 2005; Hooten 2006; Huntoon 2004) There is insufficient evidence on clinical outcomes to recommend a specific approach for performing epidural steroid injection (Ackerman 2007; Kolsi 2000; Kraemer 1997; McGregor 2001; Thomas 2003) or on use of fluoroscopic guidance. In addition, insufficient evidence exists to recommend how many epidural injections to perform, though 1 higher-quality trial found that if an initial epidural steroid injection did not result in benefits, additional injections over a 6-week period did not improve outcomes (Arden 2005).

Epidural steroid injection for the treatment of radiculopathy with herniated lumbar disc is the only percutaneous intervention found to have a net benefit, and the benefit appears to be short-term.

Decisions regarding use of epidural steroid injection should be based on a shared decision-making process that includes a discussion of the inconsistent evidence for short-term benefit, lack of long-term benefit, potential risks, and costs. Patient preferences and individual factors should also be considered. For example, epidural steroid injection may be a reasonable option for short-term pain relief in patients who are less optimal surgery candidates due to comorbidities. There is insufficient evidence to guide specific recommendations for timing of epidural steroid injection, though most trials enrolled patients with at least subacute (greater than 4 weeks) symptoms.

Evidence on efficacy of epidural steroid injection for spinal stenosis is sparse and shows no clear benefit, though more trials are needed to clarify effects (Cuckler 1985; Fukusaki 1998; Zahaar 1991). Although chymopapain chemonucleolysis (see glossary, Supplemental Digital Content 1, http://links.lww.com/A840) is effective for radiculopathy due to herniated lumbar disc, (Gibson 2007a, 2007b) it is less effective than discectomy (see glossary, Supplemental Digital Content 1, http://links.lww.com/A840) and is no longer widely available in the United States, in part due to risk of severe allergic reactions.

Recommendation #2[7]:

Facet Joint Injection, Prolotherapy, Intradiscal Corticosteroid Injection

> *In patients with persistent nonradicular low back pain, facet joint corticosteroid injection, prolotherapy, and intradiscal corticosteroid injection* **are not recommended** *(strong recommendation, moderate-quality evidence).*

Injections and most interventional therapies for nonradicular low back pain target specific areas of the back that are potential sources of pain, including the muscles and soft tissues (botulinum toxin injection, prolotherapy, and local injections [see glossary, Supplemental Digital Content 1, http://links.lww.com/A840]), facet joints (facet joint steroid injection, therapeutic medial branch block, and radiofrequency denervation [see glossary, Supplemental Digital Content 1, http://links.lww.com/A840]), degenerated intervertebral discs (intradiscal steroid injection, IDET, [see glossary, Supplemental Digital Content 1, http://links.lww.com/A840] and related procedures), and sacroiliac joints (sacroiliac joint injection)

[7] Extracted and modified from Chou, et. al. (2009)

There is no convincing evidence from randomized trials that injections and other interventional therapies are effective for nonradicular low back pain. Facet joint steroid injection (Carette 1991; Lilius 1989) prolotherapy (Dagenais 2007) and intradiscal steroid injections (Khot 2004; Simmons 1992) are not recommended because randomized trials consistently found them to be no more effective than sham therapies.

Five randomized, placebo-controlled trials evaluated prolotherapy (Gibson 2007a; Huntoon 2004; Klenerman 1984; Malmivaara 2007; Weber 1983). All were included in a higher quality Cochrane review (Willems 2004). Four trials were rated higher quality (Huntoon 2004; Klenerman 1984; Malmivaara 2007; Weber 1983). For chronic nonspecific low back pain, 3 trials (2 higher quality: Klenerman 1984, Malmivaara 2007) found no difference between prolotherapy and either saline or local anesthetic control injections for short-or long-term (up to 24 months) pain or disability (Malmivaara 2007).

Recommendation #3[8]:
Other Interventional Procedures

> *There is insufficient evidence to adequately evaluate benefits of local injections, botulinum toxin injection, epidural steroid injection, intradiscal electrothermal therapy (IDET), therapeutic medial branch block, radiofrequency denervation, sacroiliac joint steroid injection, coblation nucleoplasty, percutaneous intradiscal radiofrequency thermocoagulation …. or other medications for nonradicular low back pain.*

For local injections, there is insufficient evidence to accurately judge benefits because available trials are small, lower-quality, and evaluate heterogeneous populations and interventions (Collee 1991; Garvey 1989; Hameroff 1981; Sonne 1985). Trials of IDET (Freeman 2005; Pauza 2004) and radiofrequency denervation (Leclaire 2001; Nath 2008; van Kleef 1999; van Wijk 2005) reported inconsistent results. There were a small number of higher quality trials, and in the case of radiofrequency denervation, the trials had technical or methodologic shortcomings (Hooten 2005), making it difficult to reach conclusions about benefits**.** For other interventional therapies, data are limited to 1-2 small placebo-controlled randomized trials (botulinum toxin injection (Foster 2001), epidural steroid injection for nonradicular low back pain (Serrao 1992), PIRFT (Barendse 2001, Ercelen 2003) and sacroiliac joint steroid injection [see glossary, Supplemental Digital Content 1, http://links.lww.com/A840] (Luukkainen 2002), or there are no placebo-controlled randomized trials (therapeutic medial branch block, coblation nucleoplasty….or other medications).

[8] Extracted and modified from Chou, et. al. (2009)

Appendix A. Sources Searched for Low Back Pain Guidelines

1. British Medical Journal – Clinical Evidence
2. Cochrane Library
3. Agency for Healthcare Research and Quality
4. ECRI
5. Hayes, Inc
6. Veterans Administration – Technology Assessment Program (VA TAP)
7. Blue Cross Blue Shield HTA
8. Centers for Medicare and Medicaid
9. CADTH
10. Washington HTA Program
11. US Preventive Services Task Force
12. ICSI
13. Guidelines.gov
14. American College of Physicians AND American Pain Society
15. American Physical Therapy Association
16. PEDro.org.au (evidence-based physiotherapy database)
17. GIN Guidelines Database

Appendix B. Low Back Pain Guidelines Identified

Methods Summary:
Initially, 17 databases and other sources for guidelines related to percutaneous Interventions for low back pain were searched. Candidate guidelines were required to:

- be evidence-based (recommendations based on a full systematic review)
- be comprehensive
- be published in English
- be freely available to the public

Ten candidate guidelines were identified, of which six were sufficiently comprehensive and were assessed by two clinical epidemiologists for methodologic quality using a modified AGREE (Appraisal of Guidelines Research and Evaluation) II[9] instrument.
Candidate guidelines were then assessed considering:

- age
- source
- specific treatment elements addressed
- presentation

The GDG selected the guideline of highest quality and that was most comprehensive. (See guideline text for comprehensive Methods discussion)

Low Back Pain Guidelines Identified in Search – Selected for Quality Assessment

Armon, C., Argoff, C.E., Samuels, J., Backonja, M.M. (2007). Assessment: Use of epidural steroid injections to treat radicular lumbosacral pain: Report of the Therapeutics and Technology Assessment Subcommittee of the American Academy of Neurology. Neurology 68:723-729.
Overall guideline quality rating: Fair

Chou, R., Loesser, J.D., Owens, D.K., Rosenquist, R.W., Atlas, S.J., Baisden, J., Carragee, E.J., Grabois, M., Murphy, D.R., Resnick, D.K., Stanos, S.P., Shaffer, W.O., Wall E.M. (2009) Interventional therapies, surgery, and interdisciplinary rehabilitation for low back pain: An evidence-based clinical practice guideline from the American Pain Society. Spine 34:10:1066-1077. – accompanied by:
Chou, R., Atlas, S.J., Stanos, S.P., Rosenquist, R.W. (2009). A review of the evidence for an American Pain Society clinical practice guideline. Spine 34:10:1078-1094.
Overall guideline quality rating: Fair with good rigor of development of evidence and recommendations

Manchikanti, L ., Boswell, M.V., Singh, V., Benyamin, R.M., Fellows, B., Abdi, S., Buenaventura, R.M., Conn, A., Datta, S., Derby, R., Falco, F.J.E., Erhart, S., Diwan, S., Hayek, S.M., Helm II, S., Parr, A.T., Schultz, D.M., Smith, H.S., Wolfer, L. R., Hirsch, J.A. (2009). Comprehensive evidence-based guidelines for interventional techniques in the management of chronic spinal pain. Pain Physician 12:699-802.
Overall guideline quality rating: Poor

National Health and Medical Research Council. Australian Acute Musculoskeletal Pain Guidelines Group. (2003). Evidence-based management of acute musculoskeletal pain. (Website states that status is "current"). [Chapter 4 of document is on Acute Low Back Pain.]
http://www.nhmrc.gov.au/_files_nhmrc/file/publications/synopses /cp94.pdf
Overall guideline quality rating: Fair

[9] http://www.agreecollaboration.org/

National Institute for Health and Clinical Excellence (NICE). (2009). Low back pain: Early management of persistent non-specific low back pain. London, UK: National Institute for Health and Clinical Excellence. Retrieved September 30, 2010, from http://www.nice.org.uk/nicemedia/live/11887/44343/44343.pdf
Overall guideline quality rating: Good

Towards Optimized Practice. (2009). Management of low back pain. Edmonton, AB: Towards Optimized Practice Program.
Overall guideline quality rating: Good

Low Back Pain Guidelines Identified in Search– Not Selected for Quality Assessment

American College of Occupational and Environmental Medicine (ACOEM). (2007). Low back disorders. Occupational medicine practice guidelines: Evaluation and management of common health problems and functional recovery in workers. 2nd ed. Elk Grove Village, IL: ACOEM.
Overall guideline quality rating: Fair

Institute for Clinical Systems Improvement (ICSI). (2010). Adult low back pain. Fourteenth edition. Bloomington, MN: ICSI.
Overall guideline quality rating: Poor

Michigan Quality Improvement Consortium. (2008). Management of acute low back pain. Southfield, MI: Michigan Quality Improvement Consortium.
Overall guideline quality rating: Poor

University of Michigan Health System. (2010). Acute low back pain. Ann Arbor, MI: University of Michigan Health System.
Overall guideline quality rating: Poor

Appendix C: Methodology Checklist Adapted from the AGREE II materials

Methodology Checklist: Guidelines			
Guideline citation *(Include name of organization, title, year of publication, journal title, pages)*			
Guideline Topic:			
Checklist completed by:		Date:	
SECTION 1: PRIMARY CRITERIA			
To what extent is there		***Assessment/Comments:***	
1.1	**RIGOR OF DEVELOPMENT: Evidence** • Systematic literature search • Study selection criteria clearly described • Quality of individual studies and overall strength of the evidence assessed • Explicit link between evidence & recommendations *(If any of the above are missing, rate as poor)*	GOOD	FAIR POOR
1.2	**RIGOR OF DEVELOPMENT: Recommendations** • Methods for developing recommendations clearly described • Strengths and limitations of evidence clearly described • Benefits/side effects/risks considered • External review	GOOD	FAIR POOR
1.3	**EDITORIAL INDEPENDENCE**[10] • Views of funding body have not influenced the content of the guideline • Competing interests of members have been recorded and addressed	GOOD	FAIR POOR
If any of three primary criteria are rated poor, the entire guideline should be rated poor.			
SECTION 2: SECONDARY CRITERIA			
2.1	**SCOPE AND PURPOSE** • Objectives described • Health question(s) specifically described • Population (patients, public, etc.) specified	GOOD	FAIR POOR

[10] Editorial Independence is a critical domain. However, it is often very poorly reported in guidelines. The assessor should not rate the domain, but write "unable to assess" in the comment section. If the editorial independence is rated as "poor", indicating a high likelihood of bias, the entire guideline should be assessed as poor.

SECTION 2: SECONDARY CRITERIA, Cont.		
2.2	**STAKEHOLDER INVOLVEMENT** • Relevant professional groups represented • Views and preferences of target population sought • Target users defined	GOOD FAIR POOR
2.3	**CLARITY AND PRESENTATION** • Recommendations specific, unambiguous • Management options clearly presented • Key recommendations identifiable • Application tools available • Updating procedure specified	GOOD FAIR POOR
2.4	**APPLICABILITY** • Provides advice and/or tools on how the recommendation(s) can be put into practice • Description of facilitators and barriers to its application • Potential resource implications considered • Monitoring/audit/review criteria presented	GOOD FAIR POOR
SECTION 3: OVERALL ASSESSMENT OF THE GUIDELINE		
3.1	How well done is this guideline?	GOOD FAIR POOR
3.2	Other reviewer comments:	

Description of Ratings: Methodology Checklist for Guidelines

The checklist for rating guidelines is organized to emphasize the use of evidence in developing guidelines and the philosophy that "evidence is global, guidelines are local." This philosophy recognizes the unique situations (e.g., differences in resources, populations) that different organizations may face in developing guidelines for their constituents. The second area of emphasis is transparency. Guideline developers should be clear about how they arrived at a recommendation and to what extent there was potential for bias in their recommendations. For these reasons, rating descriptions are only provided for the primary criteria in section one. There may be variation in how individuals might apply the good, fair, and poor ratings in section two based on their needs, resources, organizations, etc.

Section 1. Primary Criteria (rigor of development and editorial independence) ratings:

Good: All items listed are present, well described, and well executed (e.g., key research references are included for each recommendation).
Fair: All items are present, but may not be well described or well executed.
Poor: One or more items are absent or are poorly conducted

Appendix D. APS Guideline Criteria for Treatment Recommendations

The APS guideline panel arrived at treatment recommendations by first evaluating the evidence for treatments according to a system adapted from the US Preventive Services Task Force for grading the evidence, then estimating the magnitude of effects, including whether the benefits of the treatment outweigh the harms.

The underlying strength of the evidence for each intervention was given a rating of good, fair or poor based on factors such as the quality, quantity, consistency, and generalizability of the evidence (Table 1).

Table 1. APS Criteria for Grading the Strength of Evidence

Rating	Strength
Good	Evidence includes consistent results from well-designed, well-conducted studies in representative populations that directly assess effects on health outcomes (at least 2 consistent, higher-quality trials)
Fair	Evidence is sufficient to determine effects on health outcomes, but the strength of the evidence is limited by the number, quality, size, or consistency of included studies; generalizability to routine practice; or indirect nature of the evidence on health outcomes (at least 1 higher-quality trial of sufficient sample size; 2 or more higher-quality trials with some inconsistency; at least 2 consistent, lower-quality trials, or multiple consistent observational studies with no significant methodologic flaws
Poor	Evidence is insufficient to assess effects on health outcomes because of limited number or power of studies, large and unexplained inconsistency between higher-quality trials, important flaws in trial design or conduct, gaps in the chain of evidence, or lack of information on important health outcomes.

Depending on the strength of the evidence for an intervention, the APS used the following criteria for making a recommendation.

Table 2. APS Criteria for making treatment recommendations

Grade	Criteria for making a recommendation
A	The panel strongly recommends that clinicians consider offering the intervention to eligible patients. The panel found good evidence that the intervention improves health outcomes and concludes that benefits substantially outweigh harms.
B	The panel recommends that clinicians consider offering the intervention to eligible patients. The panel found at least fair evidence that the intervention improves health outcomes and concludes that benefits moderately outweigh harms, or that benefits are small but there are no significant harms, costs, or burdens associated with the intervention.
C	The panel makes no recommendation for or against the intervention. The panel found at least fair evidence that the intervention can improve health outcomes, but concludes that benefits only slightly outweigh harms, or the balance of benefits and harms is too close to justify a general recommendation.
D	The panel recommends against offering the intervention. The panel found at least fair evidence that the intervention is ineffective or that harms outweighs benefits.
I	The panel found insufficient evidence to recommend for or against the intervention. Evidence that the intervention is effective is lacking, of poor quality, or conflicting, and the balance of benefits and harms cannot be determined.

If a recommendation was made, the APS assigned an overall grade of its strength, adapting the grading system of the international Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) working group. Strong recommendations are required to have clear evidence of benefit or harm. Weak recommendations are based on finely balanced benefits, risks and burdens.

Table 3. ACP Clinical Practice Guidelines Grading System[11]

Quality of Evidence	Strength of Recommendation	
	Benefits Do or Do Not Clearly Outweigh Risks	Benefits and Risks and Burdens Are Finely Balanced
High	Strong	Weak
Moderate	Strong	Weak
Low	Strong	Weak
Insufficient evidence to determine net benefits or harms		

The ACP/APS guideline panel considered interventions to have "proven" benefit if there was at least fair quality evidence of moderate or substantial benefit (or of small benefit with no significant harms, costs or burdens).

[11] Adapted from the system developed by the Grading of Recommendations, Assessment, Development and Evaluation (GRADE) workshop by the American College of Physicians.

Appendix E. Treatments addressed in APS guideline*

Treatment	Definitions Procedures are defined according to APS http://links.lww.com/A840
Prolotherapy (sclerotheraphy) Injections	A procedure involving the repeated injection of an irritant chemical into the soft tissues of the back in order to provoke an inflammatory response that will theoretically subsequently lead to strengthening of the soft tissues with decrease in pain and disability. Also referred to as sclerotherapy
Facet joint corticosteroid injections	Injection of corticosteroid into the facet joints.
Therapeutic medial branch block	Injection of local anesthetic with or without corticosteroid in the area of the medial branch of the posterior primary ramus, the primary nerve innervating the intervertebral facet joint. Usually used as a diagnostic procedure to identify facet joint pain, but has also been used as a therapeutic procedure
Intradiscal corticosteroid injections	Injection of corticosteroid into the intervertebral disc.
Radiofrequency denervation	A procedure involving the destruction of nerves using heat generated by a radiofrequency current.
Intradiscal electrothermal therapy (IDET)	A procedure involving the placement of an electrode or catheter into the intervertebral disc annulus or nucleus and applying electrothermal energy to alter adjacent pain receptors or other structures.
Epidural steroid injection	Injection of corticosteroids via a catheter into the space between the dura and the spine. Common approaches for administering epidural steroid injections are through the interlaminar space, via the neuroforamen under fluoroscopic guidance (transforaminal), and through the sacral hiatus at the sacral canal (caudal).
Local injections	Injection of local anesthetic (with or without corticosteroid) into the muscles or soft tissues of the back. Trigger point injections, a type of local injection, involve an injection performed at a tender area, often with a palpable nodule or band.
Sacroiliac joint steroid Injection	Injection of corticosteroid into or around the sacroiliac joint.
Botulinium toxin injection	Injection of botulinum toxin (an antispasmodic) into the muscles of the back.
Chemonucleolysis	Treatment of herniated discs with intradiscal injections of a proteolysis enzyme, most commonly chymopapain (an extract from papaya). Chymopapain acts by digesting the jelly-like inner portion of the disc known as the nucleus pulposus, while at the same time, leaving the outer portion, the annulus fibrosis, essentially intact.
Adhesiolysis and forceful epidural injection	(not defined)
Coblation® nucleoplasty	A procedure involving the use of a bipolar radiofrequency current in order to create a series of channels in an intervertebral disc and reduce the volume of tissue.
Percutaneous intradiscal radiofrequency thermocoagulation (PIRFT)	A procedure involving the placement of an electrode of catheter into the intervertebral disc and applying alternating radiofrequency current. Sometimes classified as a variant of intradiscal electrothermal therapy (IDET).

*Chou, R., Loesser, J.D., Owens, D.K., et al. (2009). Interventional therapies, surgery, and interdisciplinary rehabilitation for low back pain: An evidence-based clinical practice guideline from the American Pain Society. *Spine*, 34(10):1066-1077.

Appendix F. List of Peer Reviewers

Invited: Accepted & Reviewed

Susan Bamberger, PT, MPT, DIP MDT
Past President
Oregon Physical Therapy Association

Roger Chou, MD
Scientific Director
Oregon Evidence-based Practice Center
Division of General Internal Medicine and Geriatrics
Oregon Health & Science University

Timothy J. Craven, MD, MPH
Associate Medical Director
Providence Health Plan MCO

Rick Deyo, MD, MPH
Kaiser Permanente Professor of Evidence-Based Family Medicine
Director, KL2 Multidisciplinary Clinical Research Career Development Program
Director, OCTRI Community and Practice-based Research Program
Departments of Family Medicine and Internal Medicine
Oregon Health & Science University

Marc Gosselin, MD
Associate Professor
Director, Thoracic Imaging
Department of Diagnostic Radiology
Oregon Health & Science University

Luci Kovacevic, MD, MPH
Occupational Medicine Physician
Cascade Medical Associates

David Pass, MD
Anesthesiologist
Medical Director
Providence Health Plans

LaVerne A. Saboe, Jr., DC, DACAN, FICC, DABFP, FACO
Chiropractic Physician
Past president, Chiropractic Association of Oregon

Invited: Declined/Did Not Respond/Did Not Review

Fourteen additional reviewers were invited but either declined, did not respond, missed the deadline or did not return the review. Areas of professional expertise for invited reviewers included:

Anesthesiology
Behavioral Health
Complementary and Alternative Medicine
Family Medicine
Internal Medicine
Occupational Medicine
Orthopedic Surgery
Neurosurgery
Pain Advocacy
Pain Medicine
Physical Therapy
Physical Medicine and Rehabilitation
Radiology
Sports Medicine
Worker's Compensation

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Miscellaneous Conditions with No or Minimally Effective Treatments or No Treatment Necessary

Question: should a new line for miscellaneous conditions with no treatment necessary be created?

Question source: HERC staff/ICD-10 GI review

Issue: line 669 GASTROINTESTINAL CONDITIONS AND OTHER MISCELLANEOUS CONDITIONS WITH NO OR MINIMALLY EFFECTIVE TREATMENTS OR NO TREATMENT NECESSARY was proposed for breaking into two lines with the ICD-10 review. The GI experts recommended taking out "miscellaneous conditions" and making them their own line. They did not feel that it was appropriate to have GI conditions lumped with various miscellaneous conditions.

HERC staff has reviewed line 669 and all current conditions are related to the GI tract. However, other lines with no or minimally effective treatments or no treatment necessary have some miscellaneous conditions.

HERC staff recommendations:

1) Rename line 669 GASTROINTESTINAL CONDITIONS ~~AND OTHER MISCELLANEOUS CONDITIONS~~ WITH NO OR MINIMALLY EFFECTIVE TREATMENTS OR NO TREATMENT NECESSARY
2) Create a new line for miscellaneous conditions with no treatment necessary or no effective treatment
    a. Move all suggested ICD-9 and ICD-10 diagnoses from their current lines
3) Move the following ICD-9 diagnoses from current lines to line 684 ENDOCRINE AND METABOLIC CONDITIONS WITH NO OR MINIMALLY EFFECTIVE TREATMENTS OR NO TREATMENT NECESSARY
    a. 256.0 (Hyperestrogenism), 272.6 (Lipodystrophy), 272.8 (Other disorders of lipoid metabolism)

Line XXX
Condition: MISCELLANEOUS CONDITIONS WITH NO OR MINIMALLY EFFECTIVE TREATMENTS OR NO TREATMENT NECESSARY
Treatment: EVALUATION
ICD-9: 744.5 (Webbing of neck), 744.8x and 744.9 (congenital anomalies of face and neck), 748.1 (Other anomalies of nose), 754.0 (Congenital musculoskeletal deformities of skull, face, and jaw), 994.5 (Exhaustion due to excessive exertion)
ICD10: E66.3 (Overweight), E67.2 (Megavitamin-B6 syndrome), E67.8 (Other specified hyperalimentation), Q18.3 (Webbing of neck), Q18.4 (Macrostomia), Q18.5 (Microstomia), Q18.6 (Macrocheilia), Q18.7 (Microcheilia), Q18.8 (Other specified congenital malformations of face and neck), Q18.9 (Congenital malformation of face and neck, unspecified), Q30.x (congenital conditions of the nose), Q67.x (congential malformations of the head), T73.3 (Exhaustion due to excessive exertion)
CPT:98966-98969,99051,99060,99070,99078,99201-99215,99281-99285, 99341-99355,99358-99378,99381-99404,99408-99412,99429-99449, 99487-99496,99605-99607
HCPCS:G0396,G0397,G0463

Scoring
Category:9
HL: 0
Suffering: 0
Population effects: 0
Vulnerable population: 0
Tertiary prevention: 0
Effectiveness: 0
Need for service: 0
Net cost: 0
Score: 0
Approximate line placement: 670