
Introduction and Housekeeping

Clinical Training for School Dental Sealant Programs
August 2023



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Information

- All topics are a required subject for certification clinical training. Please view all of the videos.
- Please complete an evaluation after viewing the entirety of the videos
- Please complete the quiz after viewing the entirety of the videos

Information

- An 80% pass (16/20) for the quiz is needed to receive CEU. You may repeat the quiz to receive 80% or higher pass.
- The content will remain on the certification webpage until late spring 2024
- CEU eligibility will end October 1, 2023

Contact Information

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Research and Best Practice Updates

Clinical Training for School Dental Sealant Programs
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Childhood and Adolescent Caries CDC

- Among children aged 6 to 8 years, over half (52%) have had a cavity in their primary teeth
- Children from low-income families are twice as likely to have untreated cavities as higher-income children
- Among adolescents aged 12 to 19, more than half (57%) have had a cavity in their permanent teeth
- **Oregon** children age 6-9 years - 49% caries experience (2017 Smile Screening)

Oregon 2022 Student Health Survey

- The survey is for students in 6th, 8th and 11th grades
- The data is self-reported by students
- The survey is not mandatory
- The data questions include a broad and through gamut of health, housing and safety topics

<https://www.oregon.gov/oha/PH/BIRTHDEATHCERTIFICATES/SURVEYS/Pages/student-health-survey.aspx>

Oregon Student Health Survey (SHS) 2022 – Oral Health

Table 76. When did you last go to a dentist or dental hygienist for a check-up, exam, teeth cleaning, or other dental work?

	State 2022		
	6th	8th	11th
During the past year	59.4	66.9	69.2
Between 1 and 2 years ago	11.0	10.2	13.3
More than 2 years ago	4.2	5.0	6.3
Never	1.4	1.2	1.1
I am not sure	19.3	13.3	7.5
I don't know what this question is asking	1.1	0.7	0.3
I prefer not to answer	3.6	2.7	2.3

Oregon SHS 2022 Oral Health

Table 77. Have you ever had a cavity? You can choose more than one.

	State 2022		
	6th	8th	11th
During the past year	17.6	17.2	21.6
Between 1 and 2 years ago	17.6	15.2	14.3
More than 2 years ago	23.2	29.2	31.6
I have never had a cavity	29.8	28.6	26.9
I am not sure	11.6	10.4	7.4
I don't know what this question is asking	2.4	1.2	1.1
I prefer not to answer	4.1	2.9	2.4

*(Note: Totals may not sum to 100% due to multiple responses.)

Oregon SHS 2022 Tobacco Products and Drug Use

Table 111. During the past 30 days, have you used any drugs such as cocaine, ecstasy, LSD, shrooms, heroin, fentanyl or meth?

	State 2022		
	6th	8th	11th
Yes	n/a	0.6	1.4
No	n/a	95.2	95.5
I am not sure	n/a	1.1	0.8
I don't know what this question is asking	n/a	0.7	0.3
I prefer not to answer	n/a	2.5	2.0

Table 112. Select all of the tobacco products you used in the past month. You can choose more than one. (6th grade)

	State 2022		
	6th	8th	11th
Cigarettes	0.4	n/a	n/a
Vaping product or other e-cigarettes	1.4	n/a	n/a
I have not used any of these products	84.7	n/a	n/a
I am not sure	2.7	n/a	n/a
I don't know what this question is asking	4.2	n/a	n/a
I prefer not to answer	6.8	n/a	n/a

*(Note: Totals may not sum to 100% due to multiple responses.)

OR 2022 SHS Soda Consumption

Table 71. During the past 7 days how many times did you drink soda or pop, such as Coke, Pepsi, or Sprite? (Do not include diet soda or diet pop)

	State 2022		
	6th	8th	11th
0 times in past 7 days	32.7	29.2	30.8
1 to 3 times in past 7 days	35.6	41.1	41.0
4 to 6 times in past 7 days	6.4	9.6	11.2
1 time per day	6.8	6.0	6.0
2 times per day	3.3	2.8	2.1
3 times per day	1.1	0.9	1.0
4 or more times per day	1.6	1.3	1.2
I am not sure	8.5	6.4	4.5
I don't know what this question is asking	0.9	0.5	0.3
I prefer not to answer	3.1	2.3	2.0

EBP for Public Health Programs (CDC, 2013)

The CDC recommends only TWO interventions to prevent tooth decay in a community:

1. Community Water Fluoridation
2. School Dental Sealant Programs



U.S. and Oregon Water Fluoridation

- United States: 73% optimally fluoridated (2018).
- Oregon: 21.9% (2018) optimally fluoridated (w/natural = ~26%)
- Oregon currently ranks 48 out of 50 states in access to fluoridated water.
 - Only Hawaii and New Jersey rank lower.



3 Stages of Prevention

1. **Primary:** Keeps the disease process from becoming established by eliminating causes of disease or increasing resistance to disease.
2. **Secondary:** Interrupts the disease process before it progresses to symptomatic disease.
3. **Tertiary:** Treatment of symptomatic disease to prevent its progression to disability or premature death.

Sealants – Primary & Secondary Prevention

- **Primary prevention** - anatomic grooves or pits and fissures on occlusal surfaces of permanent molars trap food debris and promote the presence of bacterial biofilm, thereby increasing the risk of developing caries.
- Effectively sealing these surfaces with a dental material—for example, pit-and-fissure sealants—can prevent lesions and is part of a comprehensive caries management approach.

Sealants – Primary & Secondary Prevention

- From a **secondary prevention** perspective, sealants also can inhibit the progression of non-cavitated carious lesions.
- The use of sealants to arrest or inhibit the progression of carious lesions is important to the clinician when determining the appropriate intervention for non-cavitated carious lesions.

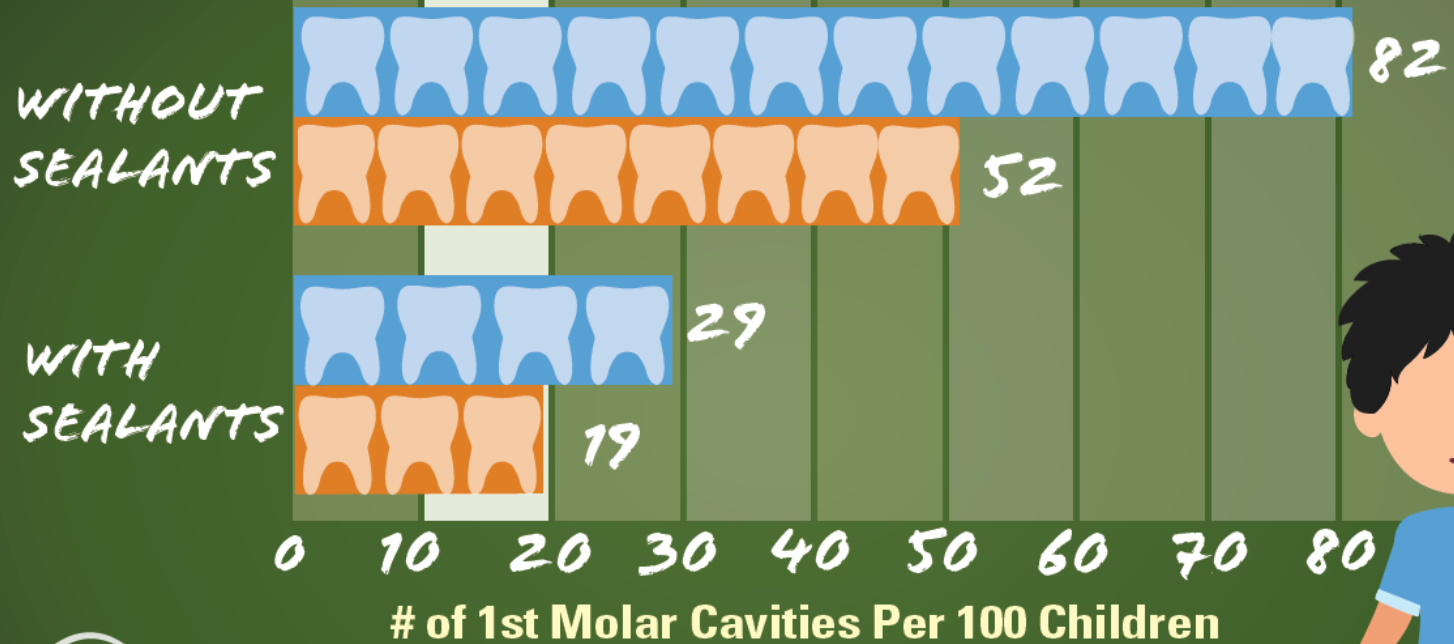
Secondary Prevention

Further confirmation that non-cavitated lesions can be sealed:

- Recent research found that caries progression after 12 months, then 2 years, was minimal with use of resin or GI sealants on ICDAS 3 (localized enamel breakdown).
- No statistical difference in caries progression between resin and GI sealant material.

Dental Sealants

- Have been used for over 50 years
- Prevent 80% of posterior caries
- Are an evidence-based prevention intervention
- Are part of a comprehensive caries prevention program
- Have placement and materials options
- Used in primary and secondary prevention



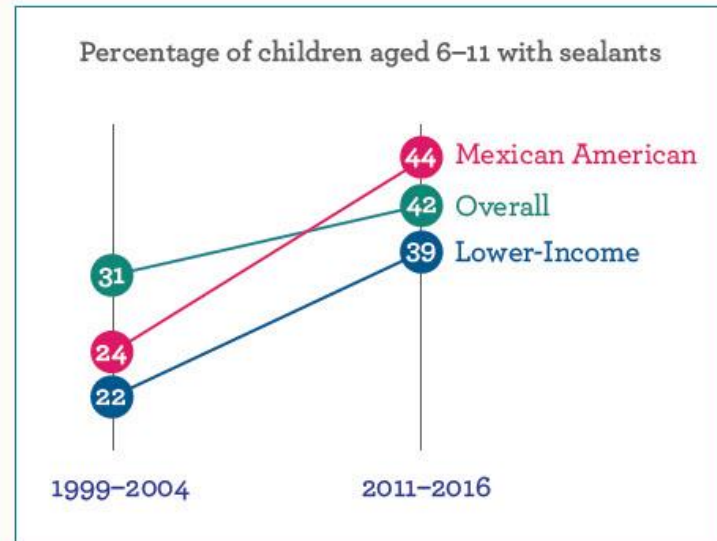
IRCE: NHANES, 1999-2004 and 2011-2014.

Sealants are Underused

Sealant prevalence increased by 35% among children



4 in 10 children aged 6–11 years had dental sealants on permanent teeth.



Sealant prevalence among **Mexican American** and **lower-income** children **nearly doubled**.

<http://bit.ly/OralHealthReport>



CS00218

Dental Sealants are Underused

- Smooth surface caries in children and adolescents has decreased, however, occlusal caries has not kept pace with this reduction. (AAPD, 2016)
- “From 1999–2004 to 2011–2016, sealant use increased by about 75% among low-income children and 43% among higher-income children. However, this effective intervention still remains underused. Less than half of children aged 6 to 11 years have dental sealants.” (CDC)

Journal of the American Dental Association

- Formerly-sealed teeth with fully or partially lost sealant were not at a higher risk of developing caries than were never-sealed teeth (JADA, 2009).
- Regardless of the setting [dental office, school], available evidence supports the conclusion that the placement of sealants over noncavitated carious lesions arrests the disease process and is cost effective (JADA, 2010).



Barriers to Accessing Sealants

- Awareness of the benefit of dental sealants
- Parent/Guardian awareness influences less use
- 55% of parents of children younger than 18 years have knowledge of dental sealants
- Awareness is lower among low income and racial- and ethnic-minority parents

(Junger et al. 2019. NIH, 2021)

Barriers to Accessing Sealants

- A California study of third graders showed that their parent's health literacy and English speaking at home were strong predictors of the child receiving dental sealants.
- Institute of Medicine report on dental care access among underserved populations found that low health literacy was a barrier to receiving preventive dental services.
- Children whose parents or guardians have low oral health literacy tend to have more plaque and endodontic treatment.

School Dental Sealant Programs

- Are highly effective for delivering sealants to children who might be less likely to receive regular or private dental care.
- For the approximately 6.5 million low-income children who do not have sealants, receiving sealants in a school program could prevent more than 3 million cavities over 4 years and save up to \$300 million in future dental treatment costs.

Health Equity Intervention

- U.S. Community Preventive Services Task Force – a panel of independent health experts – recommends school sealant programs, citing “strong evidence of effectiveness” in reducing tooth decay among school-aged children.
- Benefits of school sealant programs “exceed their costs when implemented in schools that have a large number of students at high risk for cavities.”
- “Implementing a school sealant delivery program led to a 26% increase in the number of students who received sealants. Greater increases were seen among students from low-income families.”



U.S. Community Preventive Services Task Force. Preventing dental caries: School-based dental sealant delivery programs. April 2013.
Retrieved from www.thecommunityguide.org/oral/schoolsealants.html.

Rationale for School-based Sealant Programs:

- School programs can increase access to services among vulnerable children.
- School programs can reduce racial and ethnic disparities.
- School programs can link students with treatment services in the community and facilitate enrollment in public insurance programs.
- Evidence supports recommendations to provide sealants to children even if follow-up cannot be ensured.
- Better oral health helps school performance. It is estimated that more than 51 million school hours are missed annually due to dental conditions.



School- based Dental Services (SbDS)

- SbDS are a primary access point to dental care
 - Half of students who received dental care in schools did not see a dentist in the prior year
- Younger students are most likely to receive a school based dental service
 - Elementary school students ages 5-10 - 60% of claims
 - Middle school students - 31% of claims
 - High school students - 9% of claims

(Dentaquest, Sept. 2020, NIH 2021)



School Dental Programs Provide Access to Preventive Care

- Students who had received a SBDS
 - 80% received fluoride varnish
 - 68% received a comprehensive dental examination,
 - 60% received x-rays or intraoral images
 - 42% received sealants
- SBDS leads to further care
 - One third of students who had not seen a dentist in the previous year went on to see a dentist after their SBDS

(Dentaquest, Sept. 2020)



Fluoride Varnish and SDF

- Sodium Fluoride Varnish (NaF; 22,600 ppm): Remineralizes early caries.
- Silver Diamine Fluoride (SDF; 44,800 ppm): Arrests dentine caries.
- ASTDD - Dental sealant use is firmly supported for long term caries prevention over the use of SDF.

Silver Diamine Fluoride SDF

- Silver Diamine Fluoride (SDF; 44,800 ppm):
 - Inhibits bacterial growth and biofilm formation
 - Promotes remineralization
 - Used for dentin sensitivity
 - Arrests caries

Silver Diamine Fluoride (SDF)

- SDF use is a valuable component of a caries management program.
- 38% SDF solution twice per year.
- Annual applications of SDF over 30 months are more effective than 3 weekly applications at baseline.
- Anterior teeth have higher rates of caries arrest than posterior teeth.
- Large caries, occlusal caries and those with visible plaque have less chance of arrest.

Yasmi & Neiderman (2019). *Evidence-Based Dentistry Update on Silver Diamine Fluoride*. Dental Clinics of No. America.



Other interventions not yet evidence-based:

Do not provide measurable results:

- Stand alone oral health education
- Prophylaxes



Focusing our Reach

- SDSPs are most cost-effective if students at medium to higher risk are served. SDSPs do not determine individual risk, since school programs are population-based.
- School sealant programs (SDSPs) focus on schools where at least 40% of the students are eligible for the National School Lunch Program.
- Research shows there are a significant number of students with higher risk for caries in these schools.

Focusing our Reach

According to the CDC, “...Compared with children from higher income families, children from low-income families are more likely to:”

- Have untreated caries.
- Have fewer dental sealants.
- Have not had yearly dental visits.

(CDC, 2020)

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- To distinguish between noncavitated and cavitated carious lesions, clinicians should use visual assessment; magnification is not necessary (JADA, 2010).
- Radiographs are not indicated solely for the placement of sealants (JADA, 2010).



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Use of the explorer:

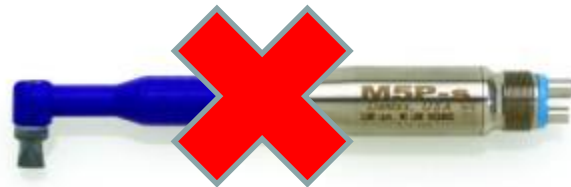
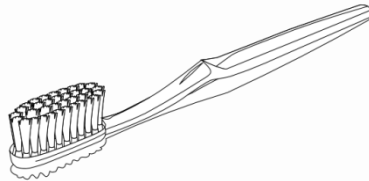
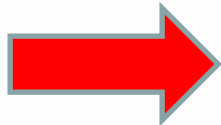
- Until the early 1980s, the use of an explorer to confirm cavitation was common.
- Up until the 1990s, dental school taught this technique, despite calls for less invasive use of the explorer.
- The evidence shows clearly that noncavitated lesions can become damaged with explorer pressure.
- Furthermore, limited evidence suggests that use of an explorer does not improve the accuracy of detection.

(JADA, 2010)



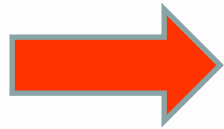
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Levels of sealant retention after surface cleaning with toothbrush prophylaxis were at least as high as those associated with handpiece prophylaxis (JADA, 2009).



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...the presence of a second operator increased retention by 9 percentage points (JADA, 2008).



Two operators
(4-handed)

One operator
(2-handed)



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“The ADA’s expert panel found limited and conflicting evidence that mechanical preparation with a bur resulted in higher sealant retention rates in children. In a systematic review, the researchers found no difference in sealant retention at 48 months” (JADA, 2008).

No need to “bur” out
the grooves



Unfilled vs. Filled Resin Sealants

- For school dental sealant programs, it is important to use <10% filled resin sealant material (self-adjusting; no need to adjust with a handpiece).
- Sealants without fillers appear to have better penetration into fissures than sealants incorporating filler particles, due to their lower viscosity.
- Retention for unfilled (64.4%) was better than for filled (53.57%).

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Sealant Material to Use: Resin (Not-recommended [AGP])

- Resin-based sealant material (JADA, 2008)
- Unfilled sealant material or at least < 10% filled (e.g. Clinpro)
 - Unfilled sealant material self-adjusts. Filled sealant material requires adjusting with a handpiece to ensure the child's bite is right.

Do not use:

- Wetbond (e.g. Embrace, which is 36% filled)
- UltraSeal XT® hydro (53% filled)



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- Embrace was as effective as resin sealants in terms of retention and caries prevention (Bhat, Konde, Raj, & Kumar, 2013).
- Embrace is a 36% filled sealant, so requires adjustment.
- Embrace Low-Fill (7%) – anecdotal reports that it is not user-friendly.
- Programs must base decisions on established research (not one or two studies) and on recommendations from reputable organizations.



Resin and Glass Ionomer (GI)

- The ADA panel was unable to determine superiority of one type of sealant over another owing to the very low quality of evidence.
- Suggests that clinicians consider retention when choosing the most appropriate type of sealant material.
- If a tooth cannot be isolated (e.g. is operculated), then GI should be used.

Resin and GI

- Prevents caries
 - AGH
 - More reliable retention
 - Contains BPA
 - More familiar material
 - Self-adjusting <10% fill
 - Technique sensitive
- Prevents caries
 - Modified non-AGH technique
 - Fluoride releasing
 - Fluoride re-charge
 - Self-adjusting
 - Does not contain BPA

Sealing Buccals and Linguals

- Buccal and lingual pits are the two most frequent surfaces of sealant failures.
- Clinicians tend to avoid sealing these surfaces, which are shallower and difficult to etch.
- However, a national survey found that buccal and lingual surfaces are the second most common caries site for children ages 12–19 (i.e. more common than interproximal mesial/distal).
- Be sure to seal the buccals and linguals and strive to improve retention.

Retention by Surface

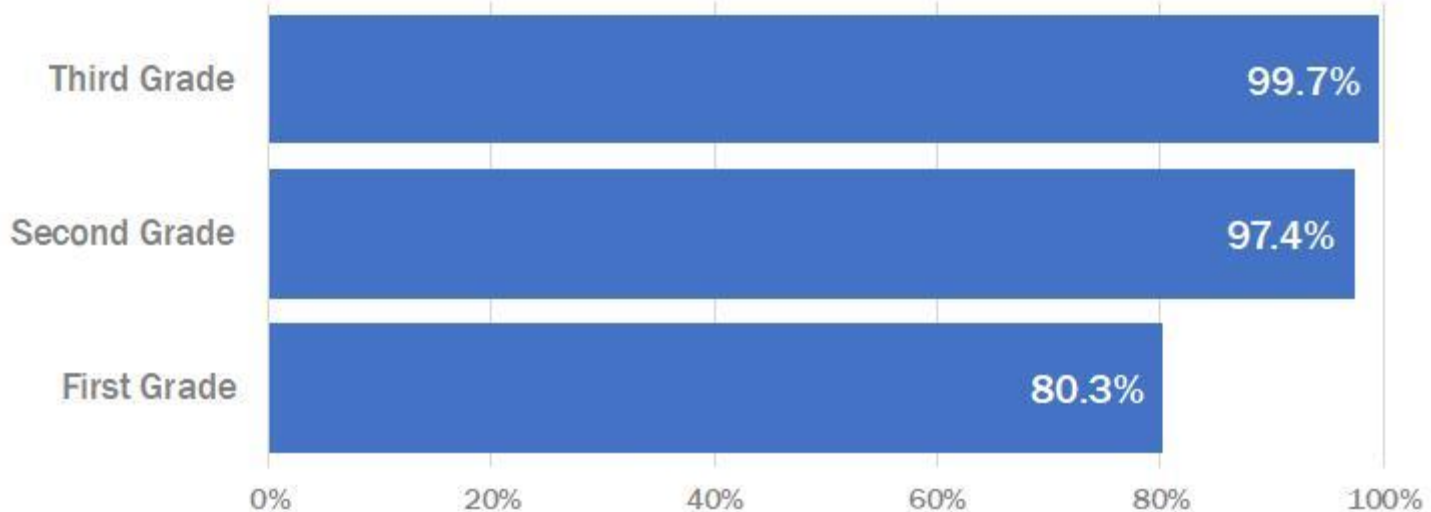
3		4	5	12	13	14	
79% D	92% M					94% M	81% D
83% Ling						78% Ling	
89% D	91% M					93% M	87% D
79% Bucc						85% Bucc	
30		29	28	21	20	19	

Sealing Operculated Molars

- “Sealants should be placed on pits and fissures of children’s and adolescents’ permanent teeth when it is determined that the tooth, or the patient, is at risk of experiencing caries.”
- GI sealants are the best option for partially erupted, operculated molars.
- If you wait until next year, it may be too late.

First Molar Eruption in Oregon

More than 80% of First Graders have at least one permanent first molar



General Information

- **Magnification:** Research findings inconsistent; magnification may be used, but it is not necessary and may not be helpful.
- **DIAGNOdent:** Many sound teeth are misdiagnosed as carious and possibly precluded from sealants.
- **Explorer:** May be used gently to check cleanliness of tooth and texture of tooth surface.
- **Bubbles/voids:** Do not require repair unless at the margin.
- **Curing time:** Follow manufacturer's guidelines; test lights periodically.

Bisphenol A (BPA)

- Check product components
- Clinpro: “Bis-GMA/TEGDMA resin composite”
- Bis-DMA and Bis-GMA are both produced using BPA as a starting ingredient, so residual BPA not chemically converted into Bis-DMA or Bis-GMA is likely present in trace amounts in any dental material containing these ingredients.
- It is important to have program protocols that specifically address the removal of BPA.
- GI materials do not contain BPA or component materials.

Outcomes

- Retention is a “process” outcome (i.e. research has shown that a retained sealant can be 100% effective).
- Reduction in caries is a true “health outcome.”
- Preliminary research indicates that although glass ionomer has less retention visually, a residual amount of material remains in the pits and fissures, releasing fluoride for an undetermined time, and has the potential for being recharged with topical fluoride.

In Oregon...

- Continue to monitor and report retention as part of certification requirements
- OHA will continue to follow national and field experts regarding developing quality measures for SDSPs



Thank you!

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