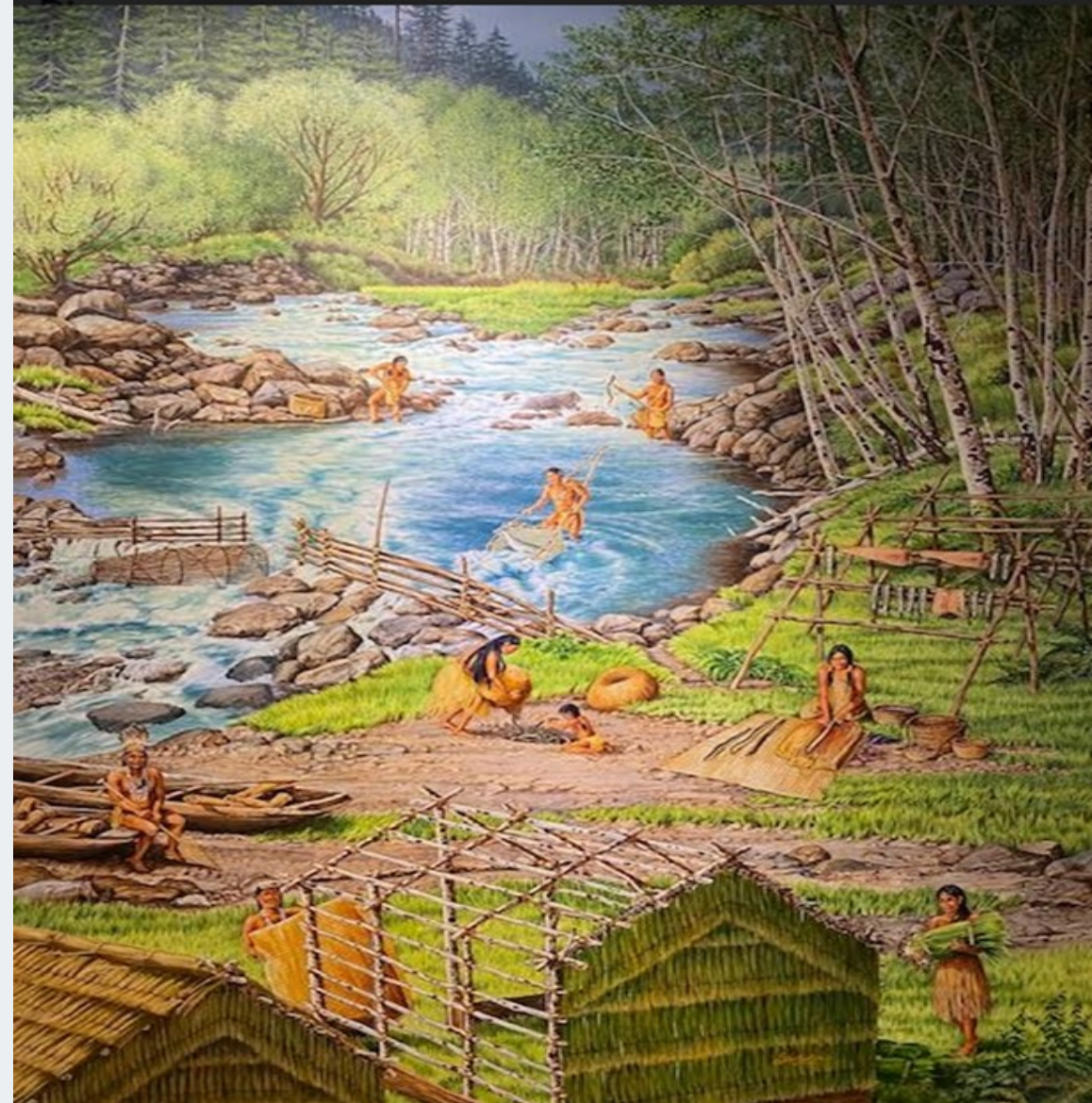


Indian Country Oral Health ECHO: Minimally Invasive Dentistry

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Photo of artwork in CTCLUSI tribal

Northwest Portland Area Indian Health Board

Established in 1972, the Northwest Portland Area Indian Health Board (NPAIHB or the Board) is a non-profit tribal advisory organization serving the forty-three federally recognized tribes of Oregon, Washington, and Idaho. Each member tribe appoints a Delegate via tribal resolution and meets quarterly to direct and oversee all activities of NPAIHB.

“Our mission is to eliminate health disparities and improve the quality of life of American Indians and Alaska Natives by supporting Northwest Tribes in their delivery of culturally appropriate, high-quality healthcare.”



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Indian Country Oral Health ECHO: Minimally Invasive Dentistry

Photo of artwork in Nez Perce
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DISCLAIMER:

We have no financial disclosures or conflicts of interest with the information in this presentation.



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Indian Country Oral Health ECHO:

Faculty:



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Pam Ready (Puyallup)
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Manager



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MA
NTDSC-
Project Director

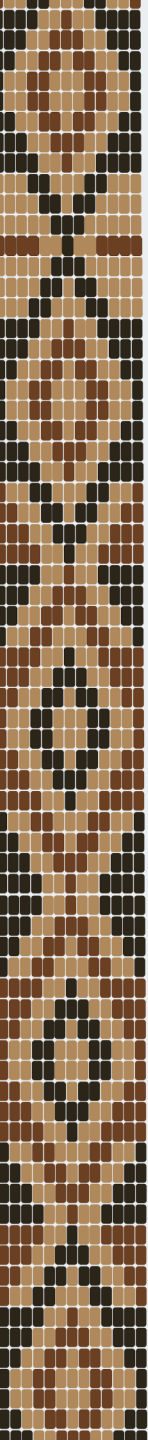


Objectives:

Upon completion of this course, participants will be able to:

1. Build minimally invasive dentistry skills.
2. Recognize risk factors and apply preventive measures to reduce the occurrence of oral health disease.
3. Learn techniques on how to treat patients with holistic and culturally appropriate care.





“The evidence-base for survival of restorations clearly indicates that restoring teeth is a temporary palliative measure that is doomed to fail if the disease that caused the condition is not addressed properly.”

<https://pubmed.ncbi.nlm.nih.gov/15646587/>



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> Oral Health Prev Dent. 2004;2 Suppl 1:287-92.

What is minimally invasive dentistry?

Dan Ericson ¹

Affiliations + expand

PMID: 15646587

Abstract

Minimally Invasive Dentistry is the application of "a systematic respect for the original tissue." This implies that the dental profession recognizes that an artifact is of less biological value than the original healthy tissue. Minimally invasive dentistry is a concept that can embrace all aspects of the profession. The common delineator is tissue preservation, preferably by preventing disease from occurring and intercepting its progress, but also removing and replacing with as little tissue loss as possible. It does not suggest that we make small fillings to restore incipient lesions or surgically remove impacted third molars without symptoms as routine procedures. The introduction of predictable adhesive technologies has led to a giant leap in interest in minimally invasive dentistry. The concept bridges the traditional gap between prevention and surgical procedures, which is just what dentistry needs today. The evidence-base for survival of restorations clearly indicates that restoring teeth is a temporary palliative measure that is doomed to fail if the disease that caused the condition is not addressed properly. Today, the means, motives and opportunities for minimally invasive dentistry are at hand, but incentives are definitely lacking. Patients and third parties seem to be convinced that the only things that count are replacements. Namely, they are prepared to pay for a filling but not for a procedure that can help avoid having one.

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Indian Country Oral Health ECHO: Minimally Invasive Dentistry Today's Clinical Faculty:



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Prevention Consultant



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Outline:

1. Didactic Presentation
 - Glass Ionomer Cement (GIC) Sealants
2. ~~Case Presentation~~ Training
3. Group Discussion and Q&A



Didactic Presentation



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GIC Sealants

Oral Health

CDC: Dental sealants are thin coatings that when painted on the chewing surfaces of the back teeth (molars) can prevent cavities (tooth decay) for many years. Sealants protect the chewing surfaces from cavities by covering them with a protective shield that blocks out germs and food. Once applied, sealants protect against 80% of cavities for 2 years and continue to protect against 50% of cavities for up to 4 years.

CDC > Oral Health home > Dental Sealants

🏠 Oral Health home

Basics of Oral Health +

Oral Health Fast Facts +

Communications Resources +

Community Water Fluoridation +

Dental Sealants -

Dental Sealant FAQs

Dental Sealant FAQs

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What are dental sealants? ^

Dental sealants are thin coatings that when painted on the chewing surfaces of the back teeth (molars) can prevent cavities (tooth decay) for many years. Sealants protect the chewing surfaces from cavities by covering them with a protective shield that blocks out germs and food. Once applied, sealants protect against 80% of cavities for 2 years and continue to protect against 50% of cavities for up to 4 years.

https://www.cdc.gov/oralhealth/dental_sealant_program/sealants-FAQ.htm



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GIC Sealants:

ADA: Sealants are systems that can be applied to the occlusal surfaces of teeth to penetrate anatomic surface pits and fissures and form a physical barrier on the tooth surface.



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Dental Sealants

Key Points

- The caries process is multifactorial and, over time, can culminate in localized destruction of hard dental tissues by weak acids.
- Effectively penetrating and sealing pits and fissures in the surfaces of teeth can prevent caries lesions and is part of a comprehensive caries management approach.
- Sealants are systems that can be applied to the occlusal surfaces of teeth to penetrate anatomic surface pits and fissures and form a physical barrier on the tooth surface.

<https://www.ada.org/resources/ada-library/oral-health-topics/dental-sealants>

GIC Sealants:

ADA: A 2016 guideline panel convened by the ADA CSA and the American Academy of Pediatric Dentistry (AAPD) developed a clinical practice guideline based on a systematic review of the literature and recommends use of pit-and-fissure sealants on the occlusal surfaces of primary and permanent molars in children and adolescents.



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Dental Sealants

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<https://www.ada.org/resources/ada-library/oral-health-topics/dental-sealants>

GIC Sealants:

ADA: The guideline panel formulated 3 main recommendations.

- sealants are effective in preventing and arresting pit-and-fissure occlusal caries lesions of primary and permanent molars in children and adolescents compared to the non-use of sealants or use of fluoride varnishes; and
- sealants can minimize the progression of noncavitated occlusal caries lesions (also referred to as initial lesions) of the tooth that received the sealant.



PRACTICE GUIDELINES | SEALANTS | VOLUME 147, ISSUE 8, P672-682.E12, AUGUST 2016

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Evidence-based clinical practice guideline for the use of pit-and-fissure sealants

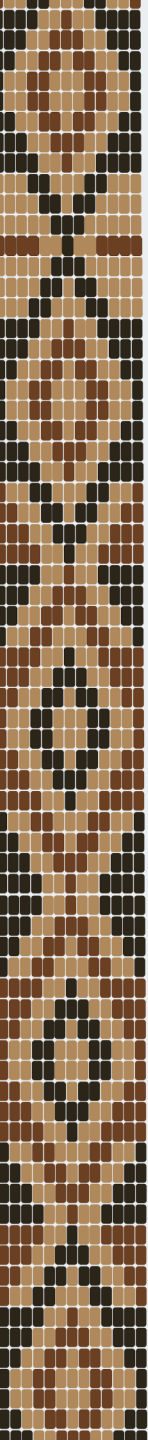
A report of the American Dental Association and the American Academy of Pediatric Dentistry

John T. Wright, DDS, MS • James J. Crall, DDS, MS, ScD • Margherita Fontana, DDS, PhD • ...

Laurel Graham, MLS • Cameron Estrich, MPH • Alonso Carrasco-Labra, DDS, MSc, PhD(c) • [Show all authors](#)

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GIC Sealants:

ADA: The guideline panel formulated 3 main recommendations.

- Finally, based on the available limited evidence, the panel was unable to provide specific recommendations on the relative merits of 1 type of sealant material over the others.

Abstract

Key Words

Definition of Dental

Caries

Epidemiology

gy

Potential

Role of Pit-

and-

Fissure

Sealants in

Primary

and

Types of Studies Reviewed

This is an update of the ADA 2008 recommendations on the use of pit-and-fissure sealants on the occlusal surfaces of primary and permanent molars. The authors conducted a systematic search in MEDLINE, Embase, Cochrane Central Register of Controlled Trials, and other sources to identify randomized controlled trials reporting on the effect of sealants (available on the US market) when applied to the occlusal surfaces of primary and permanent molars. The authors used the Grading of Recommendations Assessment, Development, and Evaluation approach to assess the quality of the evidence and to move from the evidence to the decisions.

Results

The guideline panel formulated 3 main recommendations. They concluded that sealants are effective in preventing and arresting pit-and-fissure occlusal carious lesions of primary and permanent molars in children and adolescents compared with the nonuse of sealants or use of fluoride varnishes. They also concluded that sealants could minimize the progression of noncavitated occlusal carious lesions (also referred to as initial lesions) that receive a sealant. Finally, based on the available limited evidence, the panel was unable to provide specific recommendations on the relative merits of 1 type of sealant material over the others.

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GIC Sealants



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Sachin Seth, DDS 1 • [Show footnotes](#)

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A critical summary of Yengopal V, Mickenautsch S, Bezerra AC, Leal SC. Caries-preventive effect of glass ionomer and resin-based fissure sealants on permanent teeth: a meta analysis. J Oral Sci 2009;51(3):373–382.

Clinical question

Review methods

Main results

Conclusions

COMMENTARY

ARY

Systematic review conclusion

The evidence suggests that there is no difference in the caries-preventive effects of glass ionomer cement (GIC) and resin-based fissure sealants. Therefore, both materials appear to be equally suitable for clinical application as fissure sealant materials.

....Another JADA Article Systematic review conclusion

The evidence suggests that there is no difference in the **carries-preventive effects of glass ionomer cement (GIC) and resin-based fissure sealants.**

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GIC Sealants:

COMMENTARY

Importance and context

The use of GIC-based restorative materials is advantageous, because they bond to dentin and enamel, release fluoride across an extended period and are biocompatible. They also are technically less sensitive than are conventional resin-based materials. GICs adhere to dentin and enamel via ionic and polar bonding. This action creates an intimate contact that facilitates fluoride ion exchange of the hydroxyl ions in the adjacent enamel apatite. This characteristic of GIC is desirable, especially when the material is being used as a pit-and-fissure sealant or preventive restoration.¹



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GIC Sealants:

COMMENTARY

Strengths and weaknesses of the systematic review

There were two major weaknesses in the review: the use of a fixed effects model in determining heterogeneity and the assumption of independence of tooth pairs. Since GICs release fluoride into the oral cavity, there could be a confounding effect. The anticaries effects of fluoride could be exerted on adjacent teeth that have resin-based fissure sealants, thereby altering the material's individual protective quality.



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GIC Sealants:

Implications for dental practice

On the basis of limited evidence, neither GIC nor resin-based fissure sealants are superior. Thus, the choice of whether to use GIC or resin-based fissure sealants may depend on factors such as lighting, moisture control, patient compliance and follow-up, rather than the efficacy of the material.²



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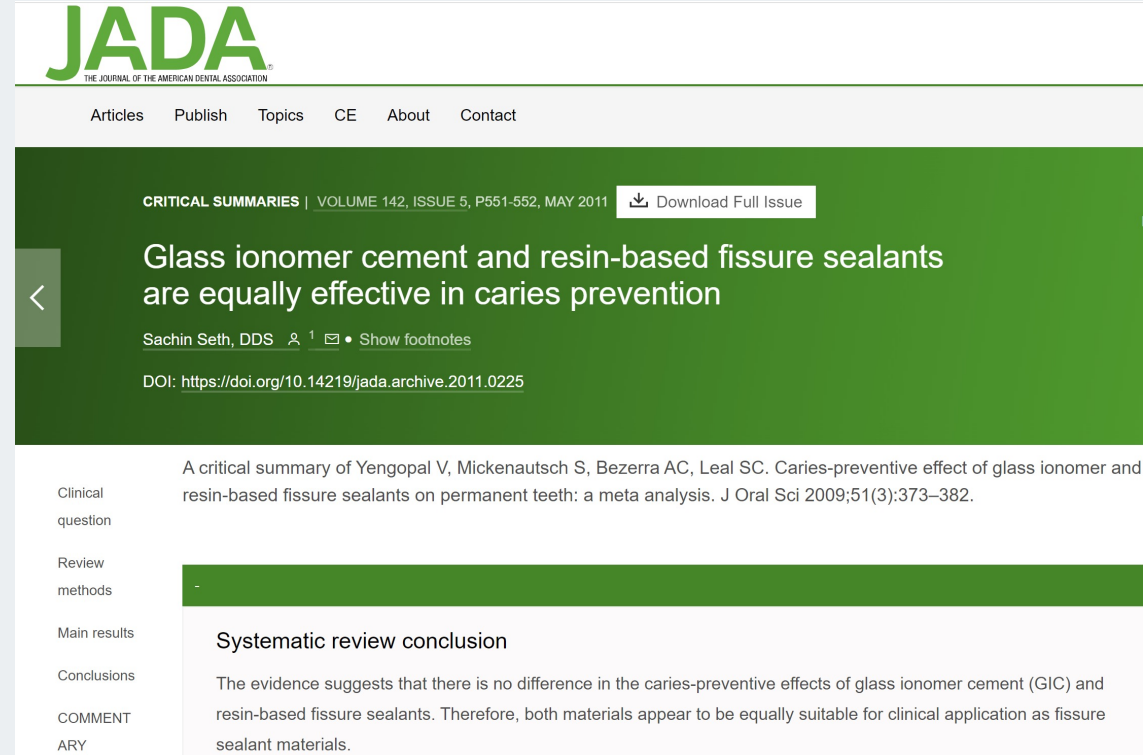
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GIC Sealants:

In January 2011, the reviewers published an update to this systematic review.³ They identified four more trials that complied with the stated inclusion and exclusion criteria. When the reviewers pooled all of the data at five years, they found no statistical significance between the two materials (relative risk, 1.33; 95 percent CI, 0.39–4.45; $P = .65$). **These updated data do not change the overall results of the original systematic review.**



The screenshot shows the JADA website interface. At the top is the JADA logo with the tagline 'THE JOURNAL OF THE AMERICAN DENTAL ASSOCIATION'. Below the logo is a navigation menu with links for 'Articles', 'Publish', 'Topics', 'CE', 'About', and 'Contact'. The main content area features a green header with the text 'CRITICAL SUMMARIES | VOLUME 142, ISSUE 5, P551-552, MAY 2011' and a 'Download Full Issue' button. The article title is 'Glass ionomer cement and resin-based fissure sealants are equally effective in caries prevention'. The author is 'Sachin Seth, DDS' with a 'Show footnotes' link. The DOI is 'https://doi.org/10.14219/jada.archive.2011.0225'. A sidebar on the left lists sections: 'Clinical question', 'Review methods', 'Main results', 'Conclusions', and 'COMMENTARY'. The 'Main results' section is highlighted in green and contains the text 'Systematic review conclusion'. The 'Conclusions' section contains the text: 'The evidence suggests that there is no difference in the caries-preventive effects of glass ionomer cement (GIC) and resin-based fissure sealants. Therefore, both materials appear to be equally suitable for clinical application as fissure sealant materials.'



GIC Sealants:

Haznedaroğlu E, Güner Ş, Duman C, Menteş A (June 2016). "A 48-month randomized controlled trial of caries prevention effect of a one-time application of glass ionomer sealant versus resin sealant". Dental Materials Journal. 35 (3): 532–8.
doi:10.4012/dmj.2016-084. PMID 27086573.



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Original Paper

A 48-month randomized controlled trial of caries prevention effect of a one-time application of glass ionomer sealant versus resin sealant

Eda HAZNEDAROĞLU, Şirin GÜNER, Canan DUMAN, Ali MENTEŞ

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Keywords: [Fissure sealant](#), [Fluoride](#), [Glass ionomer](#), [Randomized trial](#), [Resin](#)

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GIC Sealants:

After 48 months, occlusal caries were seen in 4 and 12 teeth in GIS and RS groups respectively. There was a statistically significant difference in the fluoride levels of saliva between baseline and up to 12th month in GIS group. GISs presented effective prevention of caries development, even though the failure rate is higher when compared to the RSs. An increased salivary fluoride level due to GISs might be an additive effect on the prevention of dental caries.



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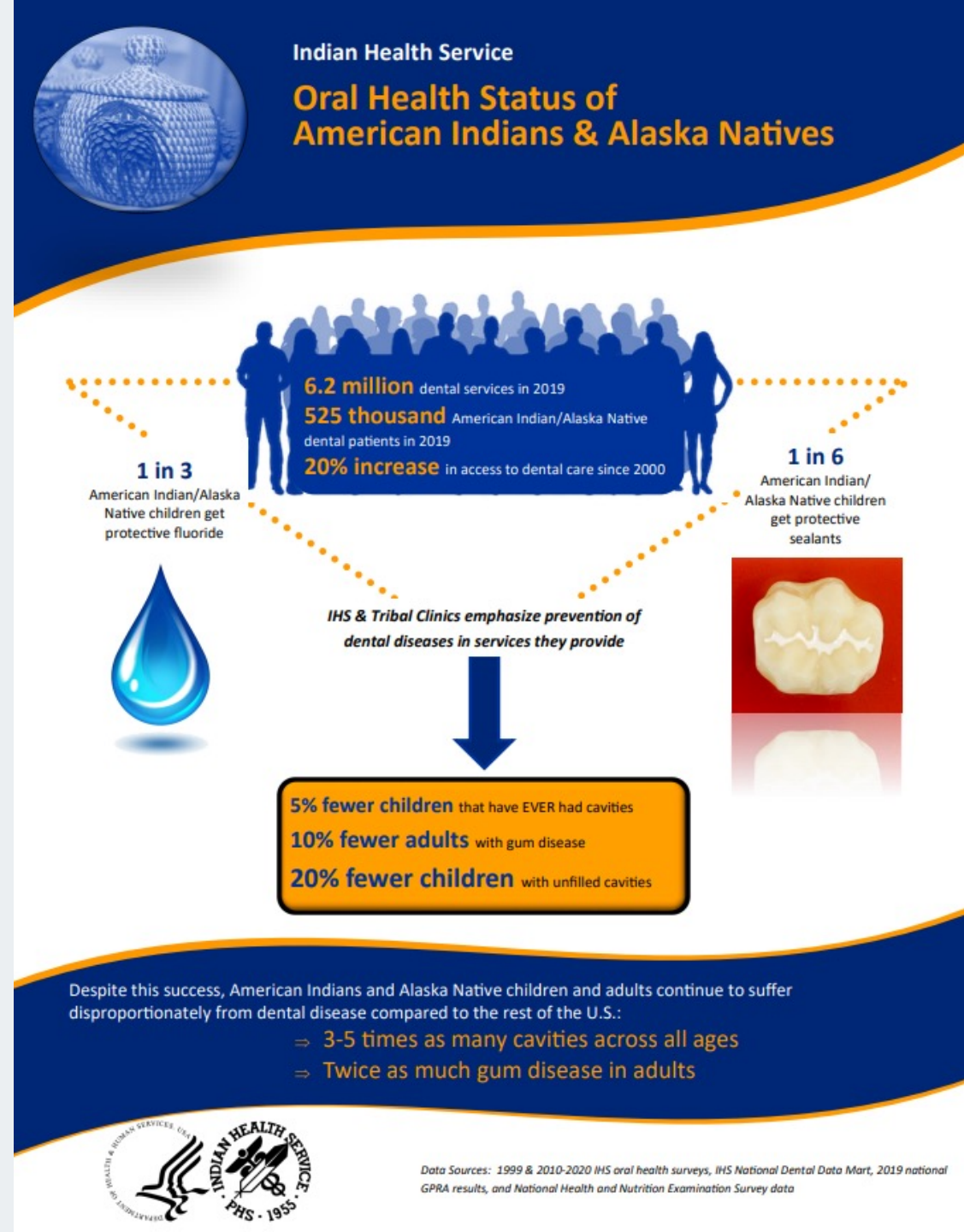
Why is this discussion about sealants even more important for Indian Country? What do you see here?

Data Sources: 1999 & 2010-2020 IHS oral health surveys, IHS National Dental Data Mart, 2019 national GPRA results, and National Health and Nutrition Examination Survey data

<https://www.ihs.gov/doh/documents/surveillance/Infographic%20encompassing%20surveys%20from%202016-2020.pdf>



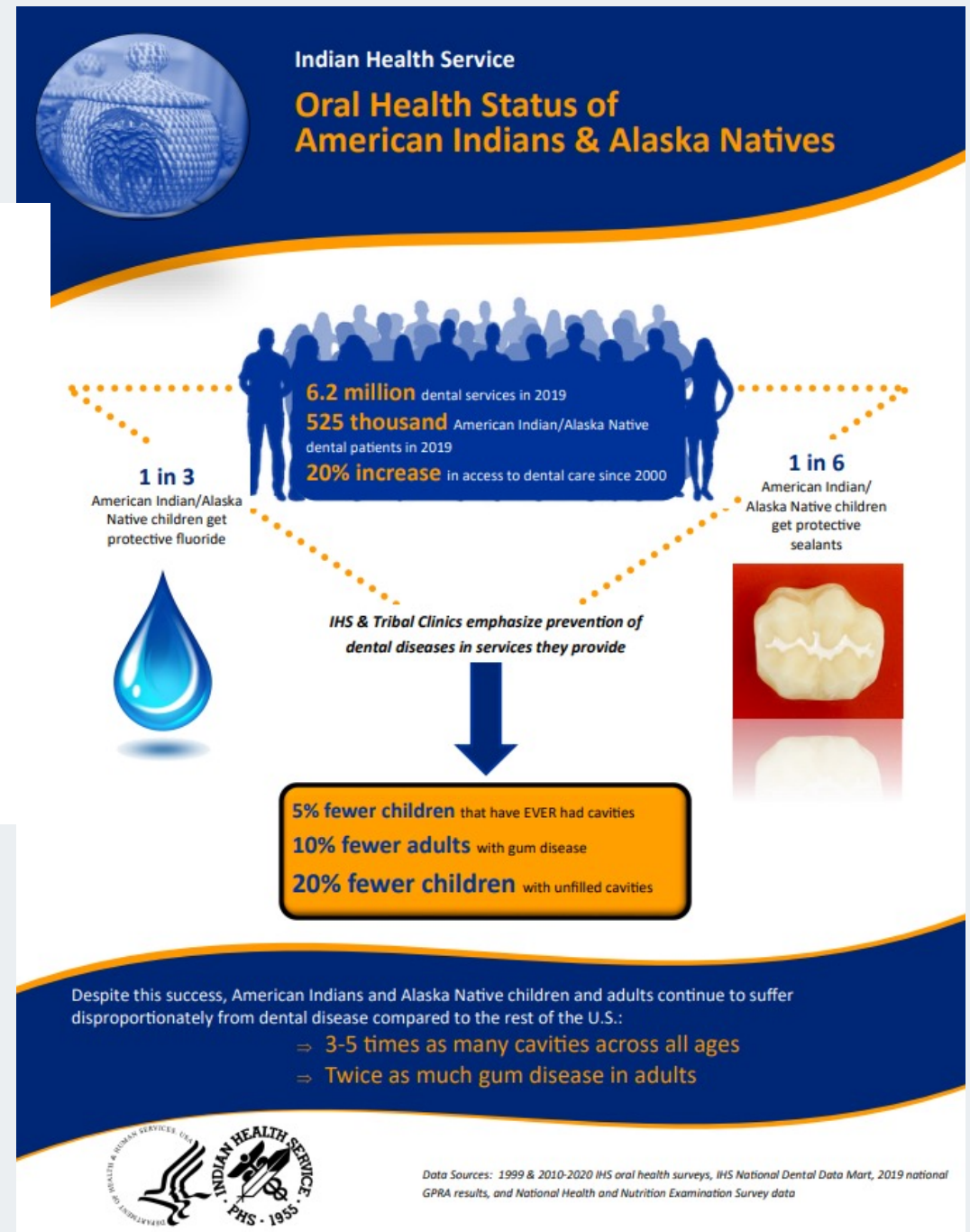
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GIC Sealants:

1 in 6
American Indian/Alaska Native
children get protective sealants

ANYTHING ELSE?



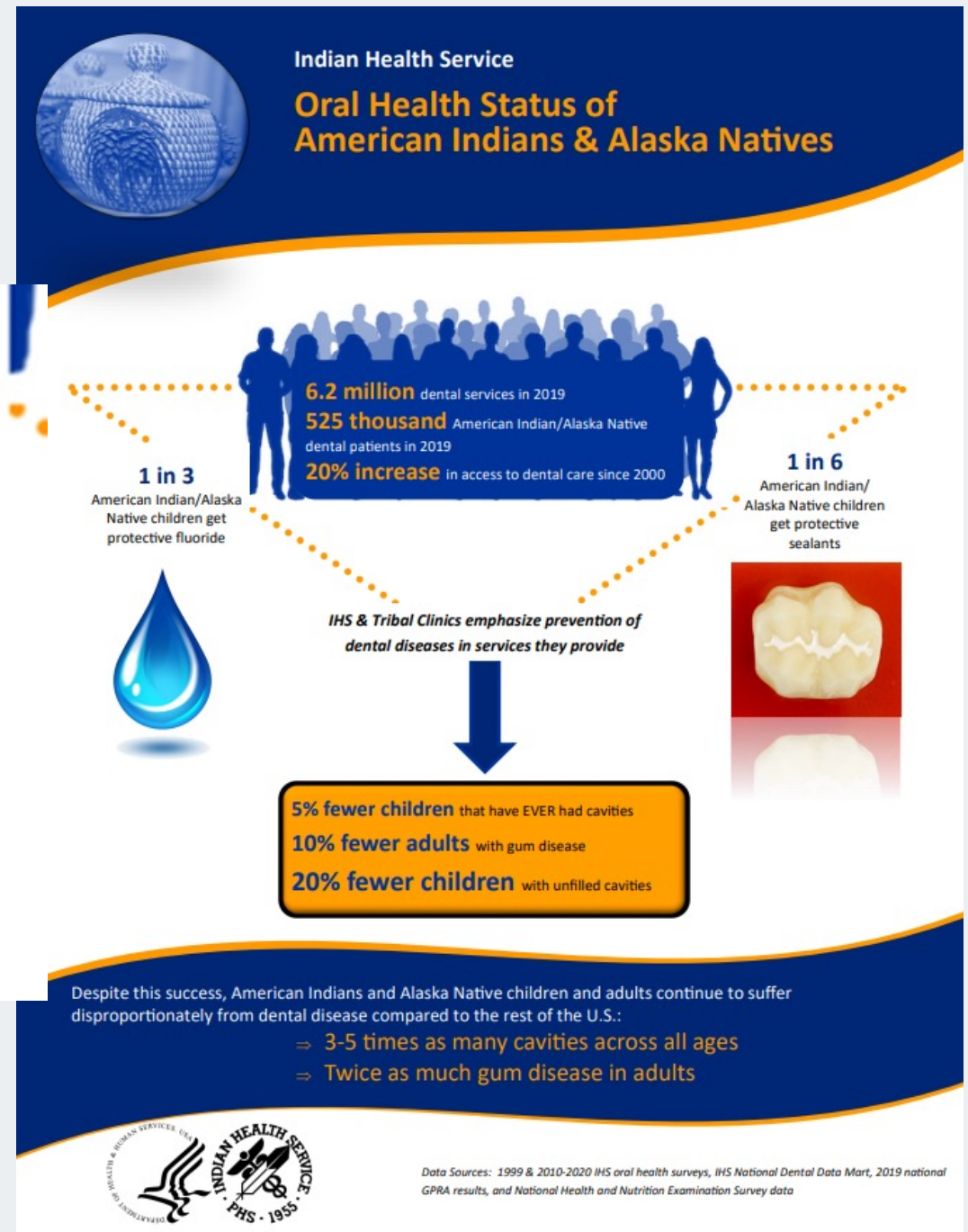
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GIC Sealants:

1 in 3
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<https://www.ihs.gov/doh/documents/surveillance/Infographic%20encompassing%20surveys%20from%202016-2020.pdf>



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Data Sources: 1999 & 2010-2020 IHS oral health surveys, IHS National Dental Data Mart, 2019 national GPRA results, and National Health and Nutrition Examination Survey data

GIC Sealants:

Look for treating with both where and when we can?!

1 in 3
American Indian/Alaska Native children get protective fluoride

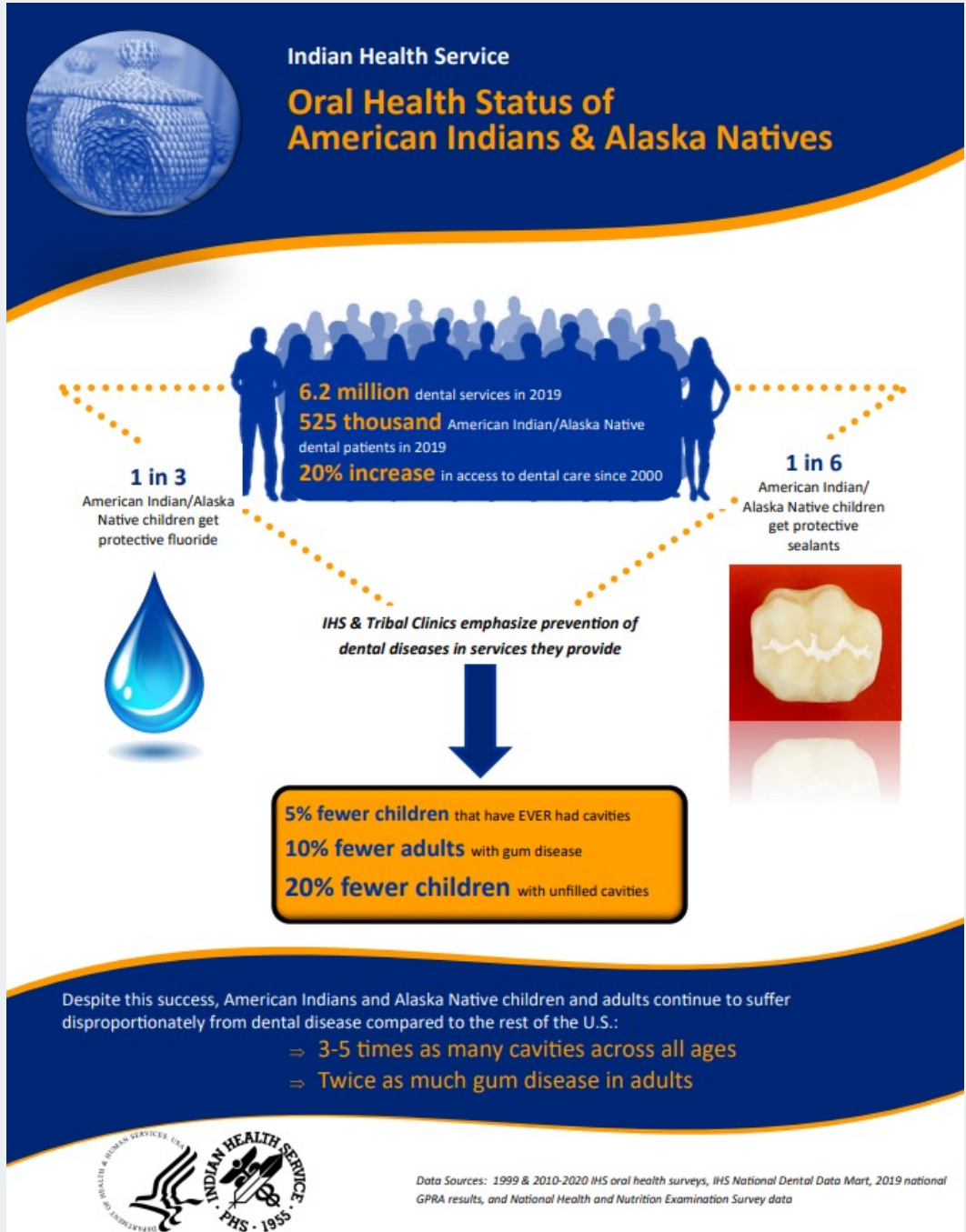


1 in 6
American Indian/Alaska Native children get protective sealants



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Indian Health Service
Oral Health Status of American Indians & Alaska Natives



6.2 million dental services in 2019
525 thousand American Indian/Alaska Native dental patients in 2019
20% increase in access to dental care since 2000

1 in 3 American Indian/Alaska Native children get protective fluoride

1 in 6 American Indian/Alaska Native children get protective sealants


IHS & Tribal Clinics emphasize prevention of dental diseases in services they provide

5% fewer children that have EVER had cavities
10% fewer adults with gum disease
20% fewer children with unfilled cavities

Despite this success, American Indians and Alaska Native children and adults continue to suffer disproportionately from dental disease compared to the rest of the U.S.:

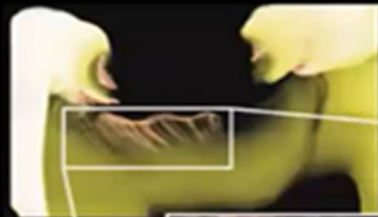
- ⇒ 3-5 times as many cavities across all ages
- ⇒ Twice as much gum disease in adults

Data Sources: 1999 & 2010-2020 IHS oral health surveys, IHS National Dental Data Mart, 2019 national GPRA results, and National Health and Nutrition Examination Survey data



Silver Diamine Fluoride (SDF):

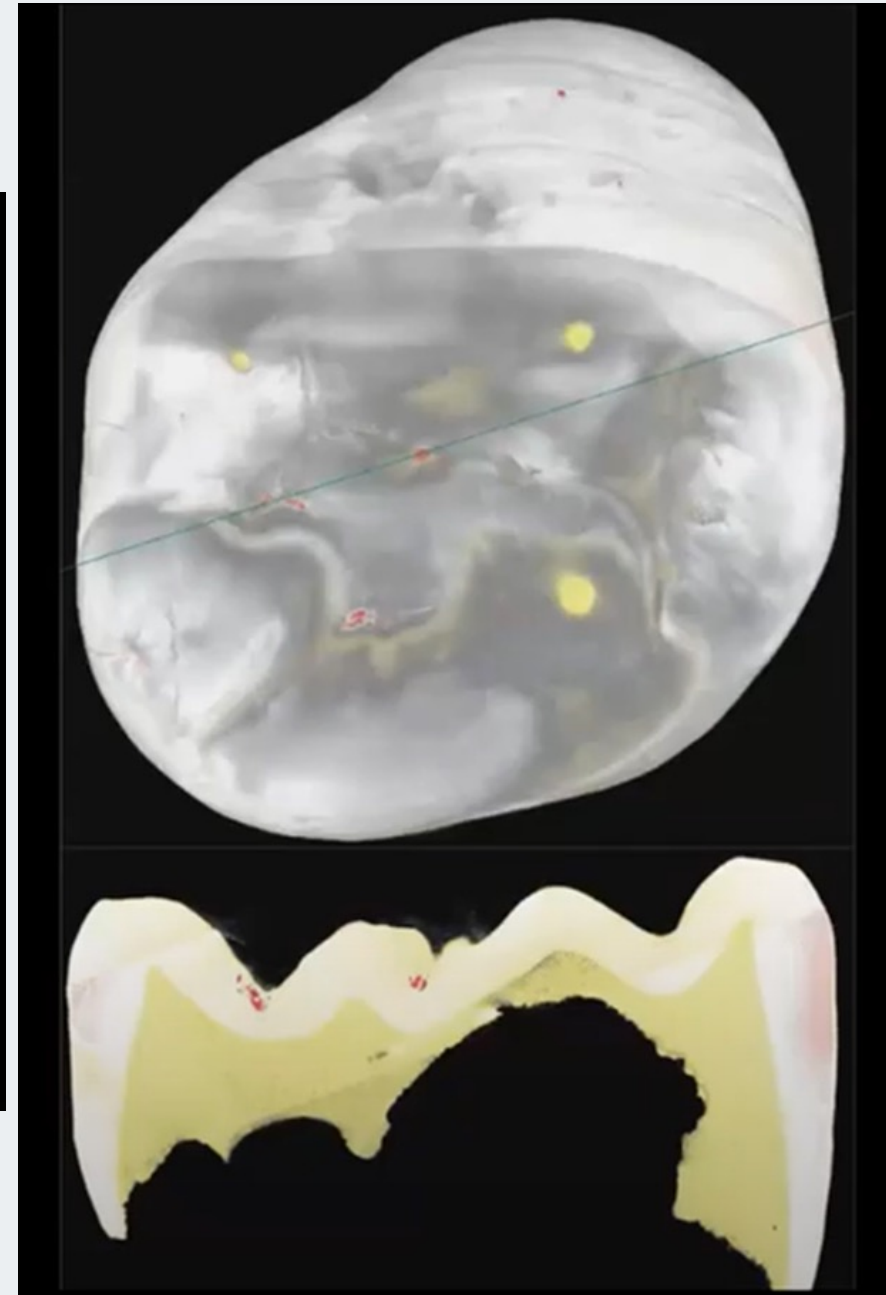
SDF hardens carious dentin



The outer layer of an SDF-arrested lesion is intensely hard, condensed necrotic dentin



Seto, Horst, Frachella, Duffin, MacLean



Silver Diamine Fluoride (SDF):

Effectiveness?

When applied to a carious lesion, SDF has also been shown to decrease caries risk of adjacent tooth surfaces. (ADA)

Llodra JC, Rodriguez A, Ferrer B, et al. Efficacy of silver diamine fluoride for caries reduction in primary teeth and first permanent molars of schoolchildren: 36-month clinical trial. J Dent Res 2005;84(8):721-4.



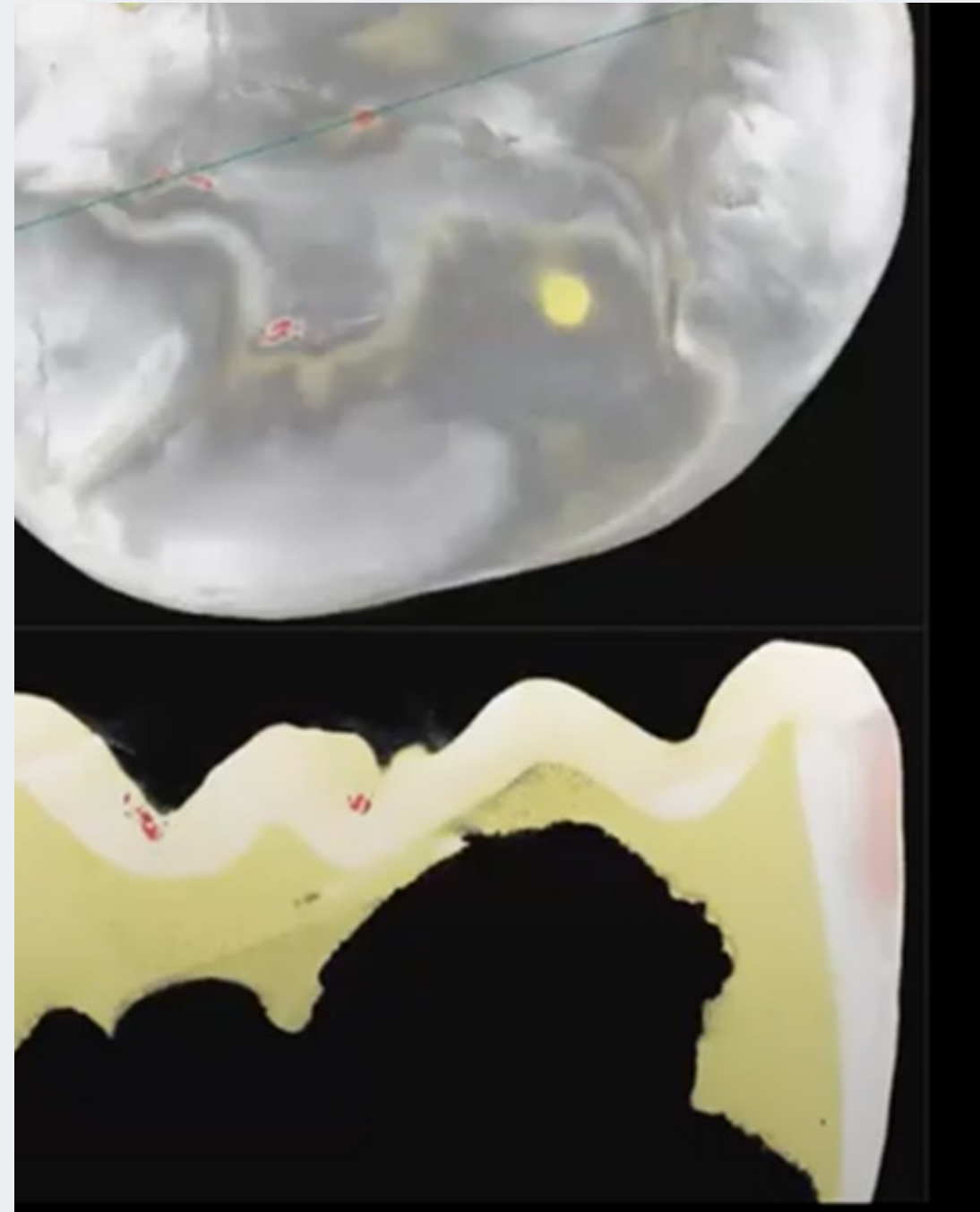
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<https://www.ada.org/resources/research/science-and-research-institute/oral-health-topics/silver-diamine-fluoride#:~:text=The%20U.S.%20Food%20and%20Drug,and%20must%20be%20professionally%20applied.>

Silver Diamine Fluoride (SDF):

Hmmmm, silver deposits in the pits and fissures! If the ionic silver acts as an antibacterial (by disrupting membranes, denaturing proteins, and inhibiting DNA replication), then what could we expect if SDF is applied prior to the sealant?

What if during the exam when sealants are treatment planned, SDF is applied, then returns for sealants (maybe even a second dose of SDF prior to placing the GIC sealant)?





GIC Sealants: vs. SDF?


Our primary experimental condition consisted of a 38% SDF solution (2.24 F-ion mg/dose). The active control consisted of glass ionomer cement sealants and atraumatic restorations, a minimally invasive approach that consists of preventive and restorative components to halt the progression of caries.^{18,19} Each participant also received a 5% sodium fluoride application.



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Noninferiority of Silver Diamine Fluoride vs Sealants for Reducing Dental Caries Prevalence and Incidence

A Randomized Clinical Trial

[Ryan Richard Ruff](#), PhD, MPH,^{1,2} [Tamarinda J. Barry Godin](#), DDS,¹ and [Richard Niederman](#), DMD¹

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GI Sealants: vs. SDF?

The crude incidence of dental caries in children treated with SDF was 10.2 per 1000 tooth-years vs 9.8 per 1000 tooth-years in children treated with sealants and ART (rate ratio, 1.05; 95% CI, 0.97-1.12).

Conclusions and Relevance

In this school-based pragmatic randomized clinical trial, application of SDF resulted in nearly identical caries incidence compared to dental sealants and ART and was noninferior in the longitudinal prevalence of caries. These findings suggest that SDF may provide an effective alternative for use in school caries prevention.



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Case Presentation Training



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GIC Sealants:

The Non-Invasive Dentistry How-To Guide

CareQuest
Innovation Partners™



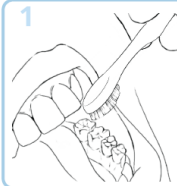
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HOW TO

apply **Glass Ionomer** cement sealants or fillings for carious or healthy fissures with a sound enamel perimeter.

CareQuest
Innovation Partners.

Clean & keep moist



Clean out debris. Do not dry.

Condition



Apply 10-20% poly-acrylic acid (PAA) conditioner to the fissures and extend onto sound enamel.

3



Rinse. For no aerosols, dab with damp cotton.

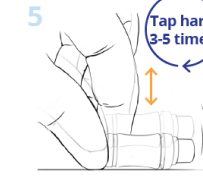
Isolate



Isolate with cotton, not a rubber dam. Keep the teeth moist.

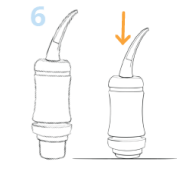
No decay is removed.

Activate



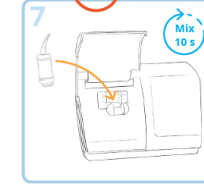
Firmly tap the capsule on a hard surface.

Experienced hand-mixers may reduce material costs with powder & liquid kits.



Compress the plunger completely. Hold it down for 2 seconds.

Mix **60 s** Working time after mix

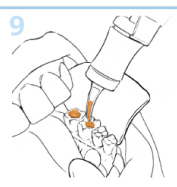


Mix for a full 10 seconds at 4,000 rpm.



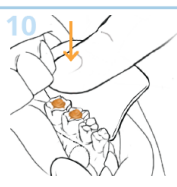
Insert the capsule into the applicator.

Apply - at least 1 quadrant at a time

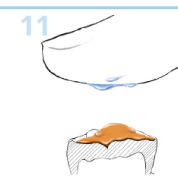


Immediately squeeze into the deepest part. To avoid air bubbles, *kiss* the tip to the moist surface and backfill while slowly withdrawing.

Release, and progress to the next tooth.

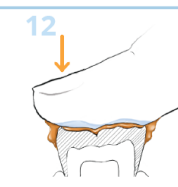


Use a gloved finger to rapidly adapt the glass ionomer into the fissures.

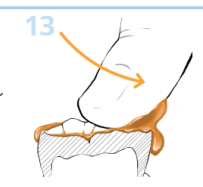


The gloved finger should be moist with the patient's saliva or a thin layer of petroleum jelly (e.g. Vaseline).

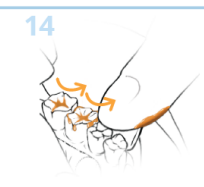
Contour



Push down firmly to allow excess to flow out.

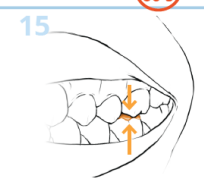


With continued downward pressure, slide the fingertip across the occlusal.



Slide the finger up and off without lifting up. Immediately continue to the next tooth, using a wave-like motion.

Bite down **end 60 s**



Remove the cotton. Help the patient bite down hard and grind. Hold the chin and click the jaws together until you feel and hear enamel-to-enamel contact. Then help the patient open.

Remove excess **≤60 s**



Use a cotton swab or explorer to remove excess from surfaces where the glass ionomer is not meant to stay. Floss as necessary. Okay to apply fluoride varnish after 3 minutes.



GIC Sealants:

Erupting 2nd molars with gingival operculum present on the distal occlusal surface.

Article by Dr. Jeanette MacLean

<https://www.aegisdentalnetwork.com/id/2022/04/preventing-caries-in-partially-erupted-molars>



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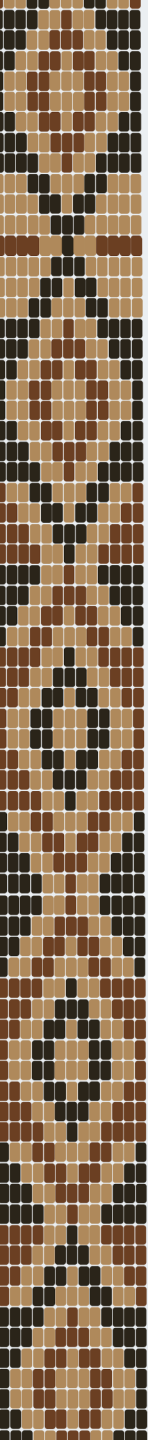


Preventing Caries in Partially Erupted Molars

Glass-ionomer sealants provide a superior alternative to resin sealants

Jeanette MacLean, DDS





GIC Sealants:

Erupting 2nd molars with GC Fuji Triage placed as a sealant

<https://www.aegisdentalnetwork.com/id/2022/04/preventing-caries-in-partially-erupted-molars>



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Jeanette MacLean, DDS



Image 10 of 11 Posttreatment photograph taken after the procedure was repeated for the contralateral molar.

GI Sealants:

Erupting 2nd molars with gingival operculum present on the distal occlusal surface

<https://www.aegisdentalnetwork.com/id/2022/04/preventing-caries-in-partially-erupted-molars>

https://youtu.be/INp5uqnm_FU?si=F_JJTnFQsG704dOO



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Preventing Caries in Partially Erupted Molars

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Jeanette MacLean, DDS



GC Fuji TRIAGE: Application with Dr. Jeanette MacLean



Adapt material to tooth surface
with finger or microbrush



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GI Sealants:

Erupting 2nd molars with gingival operculum present on the distal occlusal surface

<https://www.aegisdentalnetwork.com/id/2022/04/preventing-caries-in-partially-erupted-molars>

<https://www.youtube.com/watch?v=KJpe9CuuHT0>



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Preventing Caries in Partially Erupted Molars

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Jeanette MacLean, DDS



Triage Sealant Application Tutorial for Low Viscosity Glass Ionomer Ceme...



Rinse and Dry (but do not dessiccate)



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GIC Sealants:

A List of Recommended Studies and Articles (Courtesy of Dr. Jeanette MacLean):

1. Seth, S. “Glass Ionomer Cement and Resin-Based Fissure Sealants Are Equally Effective in Caries Prevention.” J Am Dent Assoc. 2011 May; 142(5): 551–552.
2. Oba. A.A., Dülgergil, T., Sönmez, I.S., and Dogan, S. “Comparison of Caries Prevention With Glass Ionomer and Composite Resin Fissure Sealants.” J Formos Med Assoc. 2009 Nov; 108(11): 844–848.
3. Gurgan, S., Kutuk, Z.B., Yalcin, Cakir F., and Ergin, E. “A Randomized Controlled 10-Year Follow-Up of a Glass Ionomer Restorative Material in Class I and Class II Cavities.” J Dent. 2020 Mar; 94: 103–175.
4. Mickenautsch, S., Mount, G., and Yengopal, V. “Therapeutic Effect of Glass Ionomers: An Overview of Evidence.” Aust Dent J. 2011 Mar; 56(1): 10–15.
5. Alirezaei, M., Bagherian, A., and Sarraf Shirazi, A. “Glass Ionomer Cements As Fissure Sealing Materials: Yes or No?: A Systematic Review and Meta-Analysis.” J Am Dent Assoc. 2018 Jul; 149(7): 640–649.
6. Milicich, G. Journal of Microscopy, Vol. 217, Part 1, January 2005, 44–48.
7. Hicks, J., Garcia-Godoy, F., Donly, K., and Flaitz, C. “Fluoride-Releasing Restorative Materials and Secondary Caries.” Dent Clin North Am. 2002 Apr; 46(2): 247–276.
8. Starr, J.R., Ruff, R.R., Palmisano, J., Goodson, J.M., Bukhari, O.M., and Niederman, R. “Longitudinal Caries Prevalence in a Comprehensive, Multicomponent, School-Based Prevention Program.” J Am Dent Assoc. 2021 Mar; 152(3): 224–233.

Articles:

1. <https://www.dentaltown.com/magazine/article/8683/glass-ionomer-cement-sealants>
2. [Preventing Caries in Partially Erupted Molars](#)



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GIC Sealants:



GC FujiCEM Evolve....Why?

Seán R. Kelly, DDS, MSHS

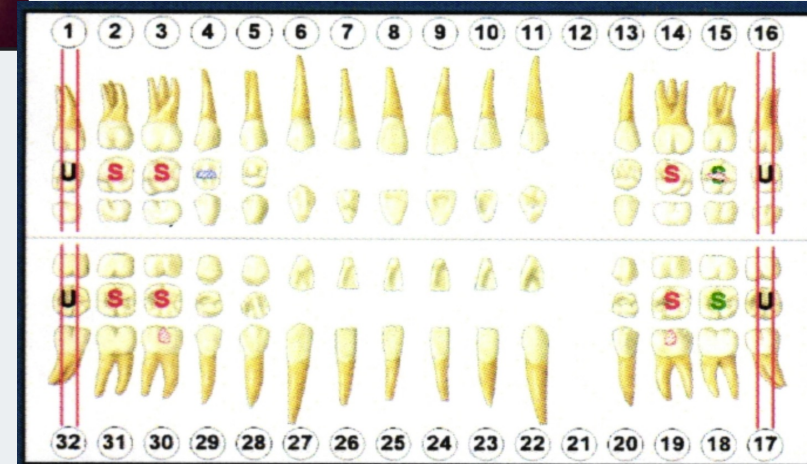
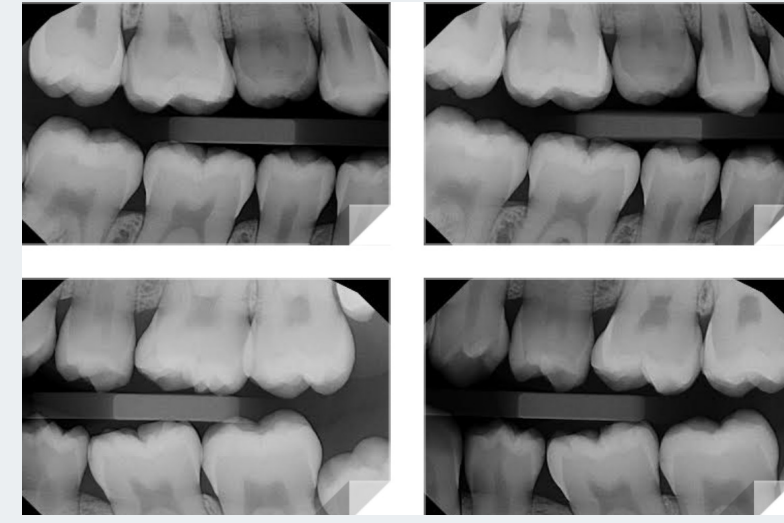
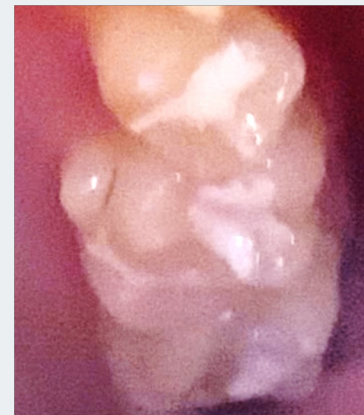
Clinical Consultant

Northwest Tribal Dental Support Center



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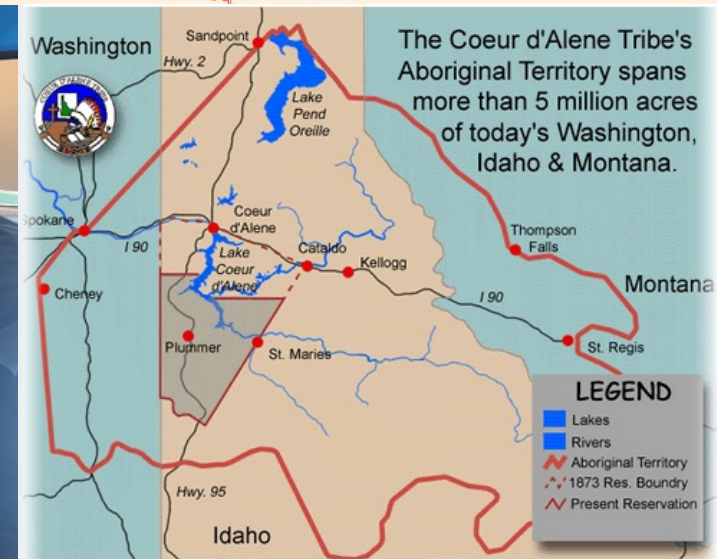
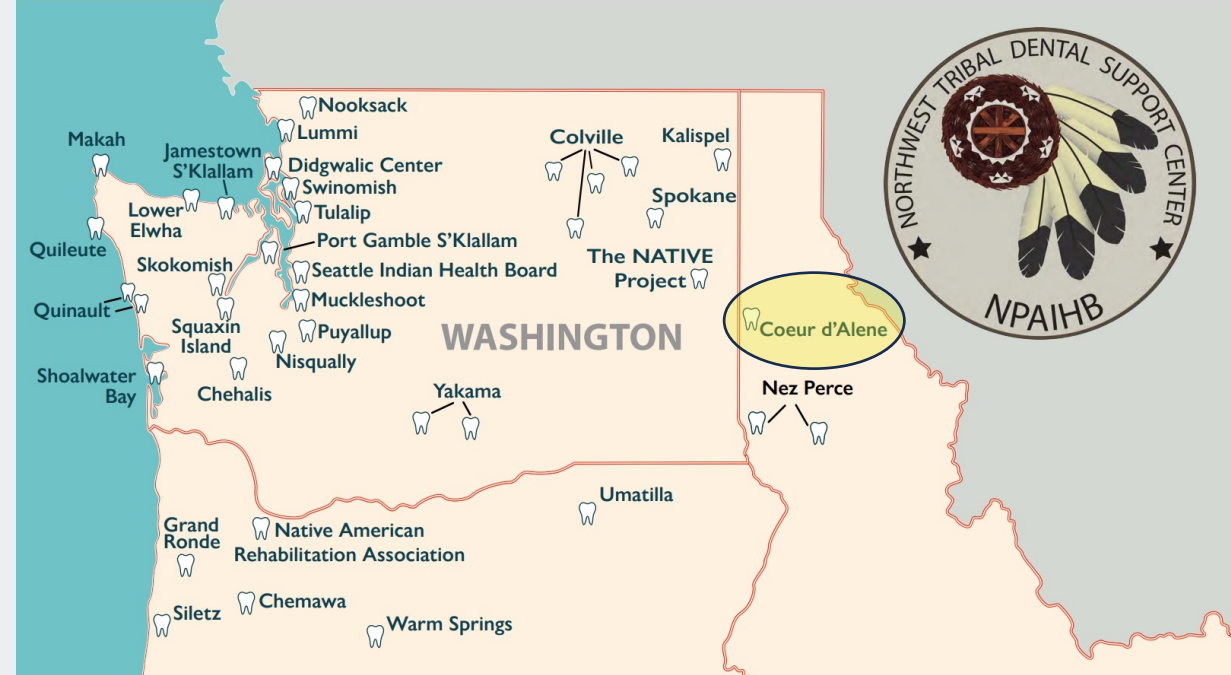
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**15 year old –
SDF and Sealants**

MID in Action

Indian Country Oral Health ECHO

Provided by:
Taylor Wilkens, DDS
Dental Director
Marimn Dental Clinic
Coeur d'Alene Tribe



Above Image from:
<https://www.cdatribe-nsn.gov/our-tribe/tribal-lands/>



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MID in Action

This patient is 9 years old.
The sealant was placed in
January of 2023. GC America
Forte.

Provided by:
Taylor Wilkens, DDS
Dental Director
Marimn Dental Clinic
Coeur d'Alene Tribe



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Group Discussion and Q & A



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Questions?



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Dr. Sean Kelly: drkelly55@gmail.com

Dr. Miranda Davis: mdavis@npaihb.org

Thank You!

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