

Dental Sealants: Evidence of Effective Use and How to Conduct a School-Based Dental Sealant Project



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Dental Sealants

- Explain what dental sealants are, and discuss their purpose.
- Review health disparities and factors that place children at risk for dental caries.
- Explain systematic reviews and their evidence on sealants and school-based programs.
- Discuss the use of sealants, preferred placement methods, and the dental community's acceptance.
- Review the steps to conduct a successful school-based sealant project.



Occlusal Caries

Pit and fissure carious lesions account for 80-90% of all lesions in permanent posterior teeth.

Brown LJ, Kaste L, Selwitz R, Furman L. Dental caries and sealant usage in US children, 1988-1991: Selected findings from the third National Health and Nutrition Examination Survey. J Am Dent Assoc 1996;127(3):335-43.

Pit and fissure carious lesions account for 44% in primary teeth.

National Center for Health Statistics, CDC. National Health and Nutrition Examination Surveys 1999-2004.



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Dental Sealants

- Dental Sealants are bonded into the pits and fissures of caries-susceptible teeth to prevent the decay causing bacteria access to its source of nutrients.
- Sealants reduce the risk of caries in the protected pits and fissures.
- The CDC reports that sealants can last for as long as 5 to 10 years.
- School-based programs generally provide sealants to children who are less likely to have dental care.



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Sealants are Effective

A Cochrane review calculated that placement of resin-based sealants **reduce caries incidence by 86% after one year and 57% at 48 to 54 months.**



Ahovuo-Saloranta A, Hiiri A, Nordblad A, Worthington H, Mäkelä M. Pit and fissure sealants for preventing dental decay in the permanent teeth of children and adolescents. *Cochrane Database of Systematic Reviews* 2004, Issue 3. Art. No.: CD001830. DOI:10.1002/14651858.CD001830.pub2.



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Important to Note:

- Sealants must be **retained** on the tooth and should be monitored to be most effective.
- Studies incorporating recall and maintenance have reported sealant success levels of 80-90% after 10 or more years.

Simonsen, *JADA* 1991; Romcke et al., *JCDA* 1990



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Who should get dental sealants? Who actually gets them?

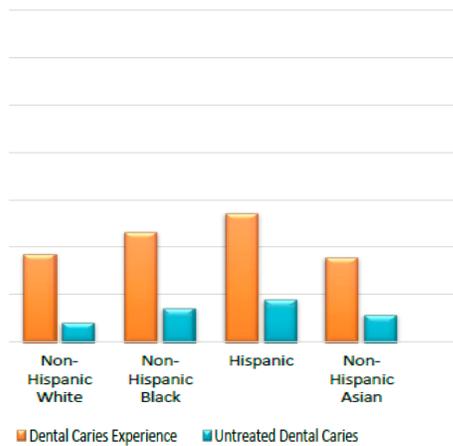
- First permanent molar one of the first permanent teeth to emerge in the oral cavity; and typically the first to develop caries lesions.
- Cochrane Review (2013) - In children and adolescents most caries increment in permanent teeth occurs on the occlusal surfaces of first molars

Ahovuo-Saloranta A, Forss H, Walsh T, Hiiri A, Nordblad A, Mäkelä M, Worthington HV. Sealants for preventing dental decay in the permanent teeth. *Cochrane Database of Systematic Reviews* 2013, Issue 3. Art. No.: CD001830. DOI: 10.1002/14651858.CD001830.pub4



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Prevalence of Dental Caries in Permanent Molar Teeth in U.S. Children and Adolescents in 2011-12 Age 6-11 years



Dye BA, et al. *Dental Caries and Sealant Prevalence in Children and Adolescents in the United States, 2011-2012*. NCHS Data Brief. No. 191, March 2015.



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Oral Health Disparities

Health disparities are the differences in disease rates between population groups that are closely linked with social or economic disadvantage.

In their document, **The Ethical Imperative of Addressing Oral Health Disparities**, J.Y. Lee and K. Divaris offered reasons why the advances in dentistry have not led to notable reductions in oral health disparities:

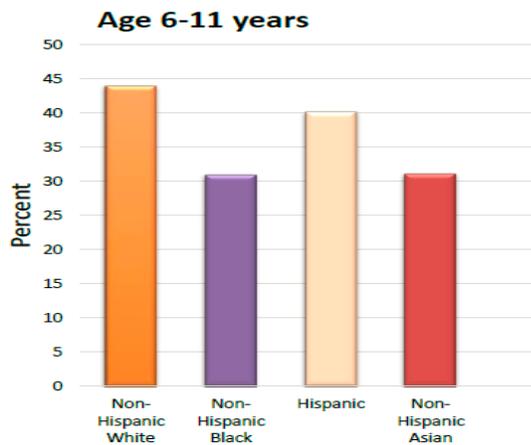
- Economic variables
- Social variables
- Community characteristics

J DENT RES published online 4 November 2013 DOI: 10.1177/0022034513511821



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Prevalence of Dental Sealants in Permanent Molar Teeth in U.S. Children and Adolescents in 2011-12



Dye B.A., et al. Dental Caries and Sealant Prevalence in Children and Adolescents in the U

Dye B.A., et al. Dental Caries and Sealant Prevalence in Children and Adolescents in the United States, 2011-2012. NCHS Data Brief, No. 191, March 2015.



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The HOW of Sealant Placement

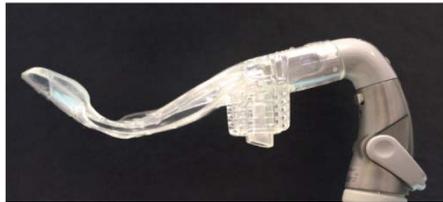
- What isolation method is best?
- Are radiographs necessary?
- Should we follow-up?
- What about sealing over incipient decay?
- Risk of future caries?
- Are sealants accepted?



Isolation Method

Muhanad looked at rubber dam vs. isolite using a splitmouth technique and found:

- The Isolite system is an effective alternative to the rubber dam.
- The IS demonstrated reduced chair time by ten minutes.
- The IS had greater patient satisfaction compared to RD isolation.
- Noise did not influence patients' preferences toward IS or RD.



Muhanad S. Alhareky, BDS, MS, Danya Mermelstein, DDS2, Matthew Finkelman, PhD, Jehan Alhumaid, BDS, DScD, Cheen Loo, BDS, PhD, MPH, DMD, (*Pediatr Dent* 2014;36:400-4)



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Isolation Method

- The isolation of the teeth to be sealed to prevent moisture contamination is the most important thing to ensure sealant success. But which method is best?
- Lyman looked at Isolite vs. Cotton roll isolation.



Todd Lyman, DDS1 • Kavitha Viswanathan, DDS, PhD2 • Alton McWhorter, DDS, MS3; PEDIATRIC D ENTISTRY V 35 / N O 3 MA Y / JUN 1 3



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Are Radiographs Necessary?

- From the 2008 report of the American Dental Association Council on Scientific Affairs entitled, **Evidence-based Clinical Recommendations for the use of Pit-and-Fissure Sealants:**

“The clinician should use recent radiographs, if available, in the decision-making process but should not obtain radiographs for the sole purpose of placing sealants.”

JADA, Vol. 139 <http://jada.ada.org> March 2008



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Is follow up necessary?

- Sealants must be retained on the tooth and should be monitored to be most effective.
- Studies incorporating recall and maintenance have reported sealant success levels of 80-90% after 10 or more years.

(Simonsen, *JADA* 1991; Romcke et al., *JCDA* 1990)



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Caries Risk in Formerly Sealed Teeth

- Evidence-based reviews have found that caries risk for sealed teeth that have lost some or all sealant does not exceed the caries risk for never-sealed teeth.
- It is therefore recommended to offer sealants to children even if follow-up cannot be ensured.

Susan O. Griffin, PhD; Shellie Kolavic Gray, DMD; Dolores M. Malvitz, DrPH;
Barbara F. Gooch, DMD, MPH, *JADA* 2009;140(4):415-423.



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Evidence-Based Decision-Making

Two reviews published in 2008 by the Centers for Disease Control and Prevention reported that sealing non-cavitated caries in permanent teeth is effective in reducing caries progression and that sealants reduced bacteria in carious lesions.



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Seal over Non-cavitated Carious Lesions?

In 2000, the independent, nongovernmental Task Force on Community Preventive Services completed a systematic review of published scientific studies demonstrating strong evidence that school sealant programs were effective in reducing the incidence of caries.

Non-cavitated carious lesions are lesions with no discontinuity or break in the enamel surface, or incipient lesions.

They found that sealants reduce the progression of incipient lesions to cavitation.

*MMWR*2001;50(RR21):1-13.



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Task Force on Community Preventive Services

This same task force also noted:

1. Exposure to school-based dental sealant programs was associated with a median relative decrease in dental caries experience of 65 percent.
2. Dental sealants are best applied to children from high-risk populations by trained auxiliaries.
3. School-based dental sealant programs should be included as part of a comprehensive population-based strategy to prevent or control dental caries in communities.

JADA 2009;140(11):1356-1365



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Task Force Recommendations Supported by the ADA

Indications for Sealant Placement

Seal sound and non-cavitated posterior teeth, with first and second permanent molars receiving highest priority.

Tooth Surface Assessment

1. Differentiate cavitated and non-cavitated lesions.
2. Unaided visual assessment is appropriate and adequate.
3. Dry teeth before assessment with cotton rolls, gauze or, when available, compressed air.
4. An explorer may be used to gently confirm cavitations (that is, breaks in the continuity of the surface); do not use a sharp explorer under force.
5. Radiographs are unnecessary solely for sealant placement.
6. Other diagnostic technologies are not required.

JADA, Vol. 140 <http://jada.ada.org> November 2009



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Task Force Recommendations Supported by the ADA

Sealant Placement and Evaluation

1. Clean the tooth surface.
 - Toothbrush prophylaxis is acceptable.
 - Additional surface preparation methods, such as air abrasion or enameloplasty, are not recommended.
2. Use a four-handed technique, when resources allow.
3. Seal teeth of children even if follow-up cannot be ensured.
4. Evaluate sealant retention within one year.

CONCLUSION

These updated recommendations, along with the supporting rationale, should increase practitioners' awareness of the **SBSP as an important and effective public health approach that complements clinical care systems in promoting the oral health of children and adolescents.**

JADA, Vol. 140 <http://jada.ada.org> November 2009



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Are Sealants Accepted?

O'Donnell conducted a study in 2013 to survey the perspectives of dentists regarding the American Dental Association recommendation to seal non-cavitated carious lesions.

Questionnaires were mailed to a randomly selected sample of 2,400 general dentists and pediatric dentists with photos of incipient lesions.

Responses showed that dentists have not adopted evidence-based clinical recommendations regarding the sealing of non-cavitated carious lesions.

<http://dx.doi.org/10.14219/jada.archive.2013.0139>



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Principles of Programs Funded by NCDHHS

OHS provides school-based dental sealant programs at no charge to parents in participating schools.

OHS works to ensure programs:

- Use a community-based approach to dental caries prevention
- Target children at high risk for dental caries
- Operate efficiently
- Ensure quality
- Maximize the use of public funding

The program operates in schools in which a certain percentage of students participate in free and reduced lunch.



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Finally, on to the project!!



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Part II The Process

- School Selection
- Site Selection
- Patient Selection
- Education is Important
- That Pesky Paperwork
- And So It Begins
- Step by Step



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School Selection

Choose a school where:

1. You have good rapport with leadership
2. Available space for temporary clinic
3. Appropriate student demographics
 - Free and reduced lunch data
 - <http://www.dpi.state.nc.us/fbs/resources/data/>
 - Past DMFT or screening data (high disease)
 - <http://www2.ncdhhs.gov/dph/oralhealth/stats/MeasuringOralHealth.htm>
 - Limited access to care



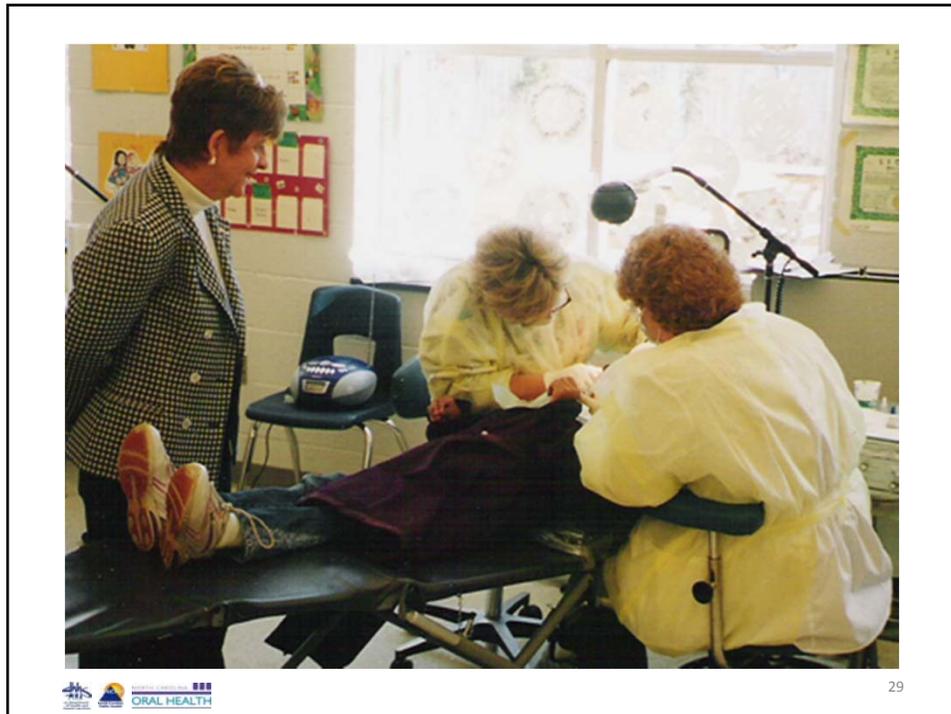
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North Carolina Department of Public Instruction
School Nutrition Services
Free and Reduced Student Data By Site
Public School Year-to-Date Data
2013 - 2014

SFA #	SFA Name	Site #	Site Name	Final ADM	Free Applications	Reduced Applications	Needy %	Grade Level
10	Alamance-Burlington St	304	Alexander Wilson Elementary	539	244	31	51.02%	Pre-K - 5
10	Alamance-Burlington St	308	Altamahaw Ossipee Elem	547	218	23	44.06%	K - 5
10	Alamance-Burlington St	312	Highland Elementary School	664	191	39	34.64%	K - 5
10	Alamance-Burlington St	320	E M Yoder Elementary	330	130	18	44.85%	Pre-K - 5
10	Alamance-Burlington St	326	Eastlawn Elementary	492	458	27	98.58%	Pre-K - 5
10	Alamance-Burlington St	328	Edwin M Holt Elementary	628	188	39	36.15%	K - 5
10	Alamance-Burlington St	340	Elon Elementary	621	191	38	36.88%	Pre-K - 5
10	Alamance-Burlington St	346	B Everett Jordan Elem	419	203	38	57.52%	K - 5
10	Alamance-Burlington St	347	Garrett Elementary	674	361	32	58.31%	K - 5
10	Alamance-Burlington St	351	Grove Park Elementary	574	439	56	86.24%	Pre-K - 5
10	Alamance-Burlington St	354	Harvey R Newlin Elementary	700	666	29	99.29%	Pre-K - 5
10	Alamance-Burlington St	357	Haw River Elementary	505	460	45	100.00%	Pre-K - 5
10	Alamance-Burlington St	358	Hillcrest Elementary	532	418	37	85.53%	Pre-K - 5
10	Alamance-Burlington St	362	Marvin B Smith Elementary	477	195	29	46.96%	Pre-K - 5
10	Alamance-Burlington St	364	North Graham Elementary	377	337	19	94.43%	Pre-K - 5
10	Alamance-Burlington St	372	Pleasant Grove Elementary	240	199	21	91.67%	Pre-K - 5
10	Alamance-Burlington St	374	R Homer Andrews Elementary	588	531	38	96.77%	Pre-K - 5
10	Alamance-Burlington St	380	South Graham Elementary	603	491	61	91.54%	Pre-K - 5
10	Alamance-Burlington St	384	South Mebane Elementary	546	218	29	45.24%	Pre-K - 5
10	Alamance-Burlington St	392	Sylvan Elementary	303	175	27	66.67%	Pre-K - 5 ⁷

Site Selection

- Enough space to accommodate dental chair, sterilization, tray set up and paper work.
- Availability of water/sink for toothbrushing, instrument sterilization, and operator hand hygiene.
- Does the space have an ability to accommodate a noisy compressor in another area?
- Are there sufficient electrical circuits?
- Contact OHS Staff Technician for site approval.



Patient Selection

- Consider time allotted for project and number of patients who can realistically be seen.
- Consider age group eruption status.
- Consider age group cooperation status.
- To prescreen or not to prescreen
 - Educational benefit to letting all parents receive information on sealants
 - Motivational benefit of inspiring more sealants

Education is Important

- Educate the students AND staff on what sealants are and the benefits of having them.
- Stress to students that sealants at school are fun.
- Consider incentives for returning forms.
- Send health history/consent forms home approximately 2 weeks prior to project.



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Paperwork is Important

- Send home:
 - Parent Information Letter
 - Health History Consent Form
 - Response Envelope
- Consider a ConnectEd message.
- As forms come in, review health history and look for proper consent signatures and potential errors on forms.

SEALANT PROJECT
PARENT RETURN ENVELOPES
WORDING IN ENGLISH & SPANISH

To the Parents of _____

1. Please sign the Consent for Dental Sealants form.
2. Place inside this envelope
3. Please return to your child's teacher tomorrow.

THANK YOU!



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But First!

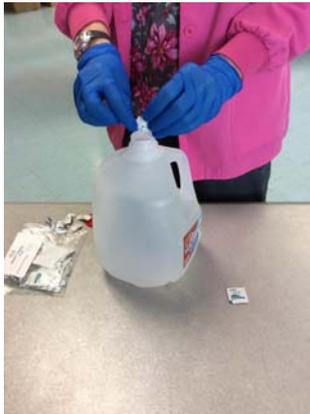
- Prior to seeing patients, assure water line safety:
- place one ICX waterline tablet into the empty dental unit water bottle
- fill with water and connect water bottle to the unit
- wait two minutes for the tablet to dissolve
- Repeat when the water from the bottle runs out.
- Time saver: premix by adding 5 tablets to 1 gallon of distilled water



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Mix Well

5 Tablets to a gallon



Shake it very well



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Also Prepare Your Ultrasonic Cleaner

1 tablet in Ultrasonic



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Prepare the Chair and Unit

Supplies covered



Infection Control



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Have Safety Equipment Ready and Handy



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Be Prepared

The day's trays are ready.



Oral Hygiene Station



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Sealant Application Technique

Application steps



Guidance from the OHS

- Use toothbrush and water to brush teeth
- Isolate teeth
- 30 second etch
- Rinse and dry
- Sealant placement
- Cure for 20 seconds
- Check with explorer
- Rinse



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When You Have Finished Your Patient

Instruments in Dirty Tray



Sterilization Area



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Ready To Be Sterilized



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Paperwork: forms and letters

- Complete and sign patient treatment form.
- Complete letter to parent/guardian reporting number of teeth sealed and any treatment needs recommended.
- Complete sealant reporting forms.
- Send thank you letters to school personnel and any volunteers who helped you.



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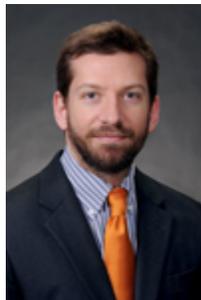
Questions?



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A Special Thank You

The N.C. Oral Health Section greatly appreciates the technical expertise provided by:



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