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Dental Sealants: Key Points From the 2008 ADA Report

The American Dental Association has published evidence-based clinical recommendations for the use of pit-and-fissure sealants. A report of the American Dental Association Council on Scientific Affairs, in the March issue of the *Journal of the American Dental Association*, answers questions regarding the indications for placing pit-and-fissure sealants, the criteria for their placement over early caries, and techniques to optimize retention and effectiveness.

Below is the abstract and a partial list of recommendations/conclusions. For the full report, go to <http://jada.ada.org/cgi/reprint/139/3/257>.

ABSTRACT

BACKGROUND. This article presents evidence-based clinical recommendations for use of pit-and-fissure sealants developed by an expert panel convened by

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ADA Unveils Ad to Support Dentistry in Developing Countries

The American Dental Association is offering a camera-ready print public service advertisement to help garner support for the Health Volunteers Overseas Dentistry Programs.

The purpose of the ad, "ADA, HVO and You — Coming together to share our care," is twofold. It seeks financial contributions in support of HVO dentistry programs and it reaches out to dentists to volunteer for the programs.

Currently, volunteer assignments are available for dentists in China, Cambodia, Vietnam, Laos, Tanzania, Nicaragua, and St. Lucia. The assignments can range from one to four weeks.

HVO is a private, nonprofit organization dedicated to improving health care in developing countries through education and training. HVO volunteers travel to resource-poor countries, with an emphasis on educating, clinical training, and increasing the number of local health workers that will benefit the community long after volunteers have departed.

The ADA and its Center for International Development and Affairs is a sponsor of the HVO overseas dentistry program. Dentists interested in learning more about volunteer opportunities can visit www.hvousa.org. Dental publications can download the four-color public service ad at http://www.ada.org/ada/international/volunteer/hvo_ad.pdf.



New Gel for Treating Pain of TMJ Disorders

Researchers have developed a gel that quickly relieves pain in the temporomandibular joint, myofacial areas, and muscles of mastication. The gel should be administered as a first-step procedure before trying to diagnose and treat the cause of the patient's pain and dysfunction. The study is published in the *Journal of Oral Implantology*.

The gel is composed of 18 percent potassium complex, 10 percent dimethylisorbide, and 72 percent aqueous hydroxyethyl cellulose gel. As soon as clinicians identify the TMJ disorder, the gel is rubbed onto the facial skin as the authors have found the gel predictably provides immediate relief from pain while accelerating the restoration of the jaw's functional abilities usually within five minutes after application.

The speed of relief from using the gel has led authors to recommend the gel be applied as a first-step procedure before definitive diagnosis and treatment. Once the pain has been eliminated as a complicating factor, a diagnosis and treatment plan regarding the jaw's biomechanical problems may be identified and dealt with.

The gel can be reapplied by the patient as needed, safely providing self-help for comfort control and aiding in the successful treatment of this problem. Topically applied, the gel is odorless, noninvasive, painless, and predictably effective.

A beverage's "buffering capacity," or the ability to neutralize acid, plays a significant role in the cause of dental erosion.

Energy Drinks May Boost Dental Erosion

Energy drinks in the United States, on the upswing over the last decade, have been promising consumers more "oomph" in their day. It is estimated the energy drink market will hit \$10 billion by 2010. While great news for energy drink companies, it could mean a different story for consumers.

Previous scientific research findings have helped to warn consumers that the pH levels in beverages such as soda could lead to tooth erosion. The studies revealed that, whether diet or regular, iced tea or root beer, the acidity level in popular beverages that consumers drink every day contributes to the erosion of enamel.

However, in a recent study published in *General Dentistry*, the Academy of General Dentistry's clinical, peer-reviewed journal, the pH level of soft drinks isn't the only factor that causes dental erosion. A beverage's "buffering capacity," or the ability to neutralize acid, plays a significant role in the cause of dental erosion.

The study examined the acidity levels of five popular beverages on the market. The results proved that popular high-energy and sports drinks had the highest

mean buffering capacity, resulting in the strongest potential for erosion of enamel.

According to the study, the popularity of energy drinks is ticking upward, especially among adolescents and young adults. Their permanent teeth are more susceptible to attack from the acids found in soft drinks, due to the porous quality of their immature tooth enamel. As a result, there is high potential for erosion among this age group to increase.

Raymond Martin, DDS, MAGD, an AGD spokesperson, said he treats more patients in their teens to 20s for tooth erosion. "They drink a great deal more sodas, sports drinks, and energy drinks," he said. "The results, if not treated early and if extensive, can lead to very severe dental issues that would require full mouth rehabilitation to correct."

To drink responsibly for oral health:

- Use a straw positioned at the back of the mouth so that the liquid avoids the teeth,
- Rinse the mouth with water after drinking acidic beverages, and
- Limit the intake of sodas, sports drinks and energy drinks.



Healthy Gums are Something to Smile About

According to a study published in the *Journal of Periodontology*, a smile may help convey healthy teeth and gums. Researchers found evidence that periodontal disease, or gum disease, may negatively affect an individual's smiling patterns and deter someone from displaying positive emotions through a smile.

The study, conducted at the University of Michigan, evaluated the smiling patterns of 21 periodontal patients while viewing a segment of a comedy program. At predetermined measurement points throughout the segment, the researchers assessed three dimensions of the patients' smile: the horizontal width of the mouth in millimeters, the open width of the mouth in millimeters, and the number of teeth shown. Additionally, the researchers also noted the number

of times the patient covered his or her mouth while watching the segment. Individual perceptions of how the patient's quality of life is affected by oral health were also considered. The data then were evaluated along with a clinical exam of the patient's periodontal health.

"Since periodontal disease is prevalent in such a large number of adults, we sought to investigate if the disease affects a person's smiling behavior," said study author Marita R. Inglehart, PhD. "Smiling plays a significant and essential role in overall well-being. Previous findings suggest that smiling can affect social interactions, self-confidence and can influence how people perceive one another."

The findings indicated that periodontal disease can impact how a person smiles. The more symptoms of gum disease found in a patient's mouth, such as periodontal pockets between 4 to 6



millimeters deep, or loose or moving teeth, the more likely the patient was to cover his or her mouth when smiling, or to limit how widely the mouth opened during the smile. Further, the more gum recession seen in the patient, the fewer teeth he or she showed when smiling.

Children's Brain Development Not Adversely Affected by Fillings

Dental amalgam tooth fillings do not adversely affect children's brain development and neurological status, researchers report in a recent issue of the *Journal of the American Dental Association*.

The authors of the report — members of a joint team from the University of Lisbon, Portugal, and the University of Washington, Seattle — studied the possible neurological effects of dental amalgam tooth restorations. Dental amalgam contains elemental mercury combined with other metals such as silver, copper, tin, and zinc to form a safe, stable alloy. Dental amalgam has been used for generations to fill decayed teeth that might otherwise have been lost.

Beginning in 1997 and continuing for seven years, the authors studied 507 Portuguese children aged 8 through 12 years who received either amalgam or resin-based composite fillings. They conducted routine clinical neurological examinations to assess two types of neurological signs: hard (indicating damage to specific neural structures) and soft (subtle signs of central nervous system dysfunction that likely point to immature sensory-motor skills rather than to any structural damage in the brain). The researchers also evaluated the children for presence of tremor.

The two groups of children, after seven years, did not differ in terms of the presence or absence of hard signs or tremor. They also didn't differ in terms of the presence or absence or severity of soft signs at any point. Also, as expected in healthy children, the severity of any neurological soft signs diminished as the children aged.



There are no findings that bacteria increase under sealants.



California Dental Association Analysis Panel Conclusions

- Reduction of caries incidence after placement of resin-based sealants ranges from 86 percent at one year to 78.6 percent at two years, and 58.6 percent at four years.
- Pit-and-fissure sealants are retained on primary molars at a rate of 74.0 to 96.3 percent at one year, 59 and 70.6 to 76.5 percent at 2.8 years.
- When possible, a four-handed technique should be used for sealant placement.
- Placement of pit-and-fissure sealants significantly reduces the percentage of noncavitated carious lesions that progress for as long as five years after sealant placement.
- There are no findings that bacteria increase under sealants. When placed over existing caries, sealants lower the number of viable bacteria by at least 100-fold and reduce the number of lesions with any viable bacteria by 50 percent.
- Two of three reviewed studies indicate that resin-based sealants are more effective in caries reduction at 24 to 44 months after placement than glass ionomer cement.
- The use of air abrasion instead of acid etching reduces the rate of sealant retention.
- Sealant retention can be improved if the clinician applies a bonding agent that contains both an adhesive and a primer between the previously acid-etched enamel surface and the sealant material.
- Presently available self-etching bonding agents, which do not involve a separate etching step, provide comparable or less retention than do bonding agents that involve a separate acid etching step.

Clinical Recommendation on Pit-and-Fissure Sealant Placement Over Early (Noncavitated) Carious Lesions to Prevent Progression

- Pit-and-fissure sealants should be placed on early (noncavitated) carious lesions to reduce the percentage of lesions that progress.

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the American Dental Association Council on Scientific Affairs. The panel addressed the following clinical questions: Under what circumstances should sealants be placed to prevent caries? Does placing sealants over early (noncavitated) lesions prevent progression of the lesion? Are there conditions that favor the placement of resin-based vs. glass ionomer cement sealants in terms of retention or caries prevention? Are there any techniques that could improve sealants' retention and effectiveness in caries prevention?

TYPES OF STUDIES REVIEWED. Staff of the ADA Division of Science conducted a MEDLINE search to identify systematic

reviews and clinical studies published after the identified systematic reviews. At the panel's request, the ADA Division of Science staff conducted additional searches for clinical studies related to specific topics. The Centers for Disease Control and Prevention also provided unpublished systematic reviews that since have been accepted for publication.

RESULTS. The expert panel developed clinical recommendations for each clinical question. The panel concluded that sealants are effective in caries prevention and that sealants can prevent the progression of early noncavitated carious lesions.

CLINICAL IMPLICATIONS. These rec-

ommendations are presented as a resource to be considered in the clinical decision-making process. As part of the evidence-based approach to care, these clinical recommendations should be integrated with the practitioner's professional judgment and the patient's needs and preferences. The evidence indicates that sealants can be used effectively to prevent the initiation and progression of dental caries.

BIBLIOGRAPHY

1. Beauchamp J, Caufield PW, et al., Evidence-based clinical recommendations for the use of pit-and-fissure sealants. A report of the American Dental Association Council on Scientific Affairs. *J Am Dental Assoc* 139(3):257-68, 2008. Copyright 2008 American Dental Association. All rights reserved. Reprinted by permission.

UPCOMING MEETINGS

2008

May 1-4 CDA Spring Scientific Session, Anaheim, 800-CDA-SMILE (232-7645), cda.org.

May 2-3 Evidence-based Dentistry Champion Conference, ADA headquarters, Chicago, ada.org/goto/ebdconf.

May 4 International Conference on Evidence-based Dentistry, ADA headquarters, Chicago, ada.org/goto/ebdconf.

May 6-9 Conference for Oral Health in the Americas, Lima, Peru, http://www.fdiworldental.org/public_health/3_1conferences.html.

July 16-20 56th Annual Meeting and Exhibits, Academy of General Dentistry, www.agd2008orlando.org.

Sept. 12-14 CDA Fall Scientific Session, San Francisco, 800-CDA-SMILE (232-7645), cda.org.

Sept. 24-27 FDI Annual World Dental Congress, Stockholm, congress@fdiworldental.org.

Oct. 16-19 American Dental Association 149th Annual Session, San Antonio, Texas, ada.org.

Oct. 25-29 American Public Health Association Oral Health Section's annual meeting and exposition, San Diego, www.apha.org/meetings.

2009

May 14-17 CDA Spring Scientific Session, Anaheim, 800-CDA-SMILE (232-7645), cda.org.

Sept. 11-13 CDA Fall Scientific Session, San Francisco, 800-CDA-SMILE (232-7645), cda.org.

Oct. 1-4 American Dental Association 150th Annual Session, Honolulu, Hawaii, ada.org.

To have an event included on this list of nonprofit association continuing education meetings, please send the information to *Upcoming Meetings*, CDA Journal, 1201 K St., 16th Floor, Sacramento, CA 95814 or fax the information to 916-554-5962.

Honors

Eugene LaBarre, DMD, MS, of Alameda, Calif., associate professor and chair of the Department of Removable Prosthodontics at the Arthur A. Dugoni School of Dentistry, is a recipient of the 2008 Medallion of Distinction. The award is the highest honor the dental school Alumni Association can bestow upon an individual.



Eugene LaBarre, DMD, MS

Population-based Evaluation of Antenatal Diagnosis of Orofacial Clefts 8:188

In trying to evaluate whether there have been any changes in the prevalence or antenatal detection of clefts, while researchers have found no change in prevalence of the Nova Scotia population they do cite improved detection. Their study is published in the latest issue of *The Cleft Palate — Craniofacial Journal*.

Affecting nearly 7,000 children each year, or 1 in every 600 newborns, clefts are the most frequent birth defect in the United States. They may be visible by diagnostic imaging techniques as early as the first trimester, when fusion of the facial prominences and palatal shelves occurs. For several decades, clefts of the lip and primary palate have been diagnosed antenatally with 2-D ultrasonography.

In the study, 225 fetuses were identified as having orofacial clefts. The overall prevalence of clefts was 2.1 in 1,000 live births, and this prevalence did not change with time. The overall antenatal detection of cleft lip with or without cleft palate was 23 percent. However, there was improvement in detection of cleft lip with or without cleft palate from the years 1992 to 1996 (14 percent) to the years 1997 to 2002 (30 percent). No isolated cleft palates were detected antenatally.

To read the entire study, go to <http://www.allenpress.com/pdf/CPCJ45-2-article.pdf>.

