

Increase in Utilization of Dental Sealants

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Abstract

Aim: The purpose of this review is to explore how to increase utilization of dental sealants to reach the national 50% sealant objective as stated in the Healthy People 2010 document.

Background: Dental decay is the most common chronic childhood disease. A simple, cost-effective preventive measure to manage this disease is through sealant application.

Review: Although dental sealants are effective in reducing the risk of having dental decay, their rate of utilization among children and adolescents is below the objective set forth by the Healthy People 2010 document. This is related to the lack of public awareness, patient education, and inadequate reimbursement for sealants served by third-party insurers.

Conclusion: Dental decay is the most common chronic childhood disease. Dental sealants are a simple, cost-effective preventive measure to manage this disease. In order to meet the national 50% sealant objective of the Healthy People 2010 document, public awareness and the education of consumers about the benefit of having dental sealants must be improved. Third-party insurers must improve the benefits for subscribers seeking dental sealant services. Using these approaches, the utilization of dental sealants will improve the oral health among the next generation of Americans.

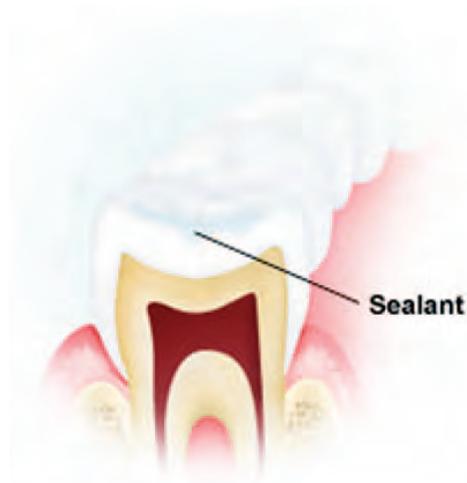
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Introduction

The morphology of the pits and fissures on the occlusal surfaces of premolars and molars render them highly vulnerable to tooth decay. Dental decay is caused by a multifactorial process of the bacterial plaque and carbohydrate substrate on a tooth surface. Cariogenic bacteria, if present in dental plaque, converts sugar or starch from foods into acids that cause enamel demineralization which eventually leads to the formation of caries. Garcia et al.¹ stated not all the surfaces of a tooth are susceptible to caries and the majority of carious lesions occur in occlusal pit and fissures, therefore, sealant utilization is critical to the reduction of occlusal decay. The 1983 and 2001 National Institutes of Health (NIH) Consensus Development Conferences, the 2000 Surgeon General Report, and other reports concluded the placement of sealants is an effective means of preventing tooth pit and fissure caries.²⁻⁶ Dental sealants have been used for over 30 years and are approved by the American Dental Association, National Institutes of Dental and Craniofacial Research, and the American Public Health Association.



A dental sealant is a composite resin material placed over the pits and fissures of susceptible teeth. They provide a physical barrier between caries-susceptible occlusal pit and fissure tooth surfaces and the oral environment, thus, preventing the initiation of dental caries. First-generation sealants were polymerized by ultraviolet light, second-generation sealants were autopolymerized, and third-generation sealants require visible light.^{1,7} New dental sealant materials offer a fluoride-releasing effect, employ smart color-change technology (Clinpro-3M

ESPE, St. Paul, MN, USA), or use a photochromic dye (Helioseal Clear Chroma-Ivoclar Vivadent, Schaan, Liechtenstein) to facilitate application and monitoring of the sealant during recall appointments. “The colored products permit a more precise placement of the sealants, with the visual assurance that the periphery extends halfway up the inclined planes.”¹

Effectiveness of Dental Sealants

The reduction of occlusal caries following dental sealant application is highly significant and dependent upon dental sealant retention.^{1,3,8} Mertz-Fairhurst⁹ reported, “90 to 100% of the original sealants were retained over a one-year period”. Adair¹⁰ concluded, “after one year in clinical trials sealant success rates have been reported as high as 92% in terms of complete retention”, in a review of the literature. For the five-year complete retention rate, Richardson et al.^{11,12} found a 67% retention rate. A 15-20 year cohort study on the retention of fissure sealants in permanent molars found a 65% complete retention rate.¹³ However, with improvements such as bonding agents in the sealant materials retention rates can increase.^{14,15,16} The most common cause for sealant failure is moisture contamination during the application.^{1,2} Training of dental professionals and better management of the operative field with the use of a rubber dam can improve the application technique as suggested in a study by Ganss.¹⁷ If cotton roll isolation is used, a combination of bibulous pads covering Stensen’s duct and using a high-volume evacuation along with the operator and the assistant working to maintain a dry field is recommended.¹

Dental sealants that are applied to the teeth using appropriate techniques are virtually 100% effective in preventing tooth decay.^{2,3,18} In a 1997 study, Carlsson et al.¹⁹ found a 45% lower caries development rate in permanent molars in the sealed group of teeth. Concurrently, Bhuridel et al.²⁰ reported “permanent first molars with sealants were less likely to receive subsequent restorative treatment than were those without sealants.” Hence, this preventive method can save money on healthcare expenditures by avoiding more labor intensive and invasive dental procedures such as restorative, endodontic, and surgical care.²¹

Utilization of Dental Sealants

According to a report of the U.S. Surgeon General in 2000, dental decay is the most common chronic childhood disease. Fifty percent of 5- to 9-year-old children have at least one cavity or filling, and that rate increased to 78% among 17-year-olds.¹⁸

Although prevalence among children and adolescents of one or more sealed permanent tooth surfaces increased about 13% during the periods of 1988-1994 to 1999-2002, it is still well below the objective set by the Healthy People 2010 document which is 50% of sealant use among this population.²²



A barrier to effective utilization of sealants is “lack of consumer knowledge of the effectiveness of sealants, and, resultantly, a lack of demand for the product.”¹¹

Another barrier mentioned by a 1996 study of Ohio dentists was the insurance coverage for sealants. “Dentists continue to identify lack of insurance coverage for sealant application as a major barrier to patients receiving the service.”²³ A 1998-99 Ohio State survey of third grade students in school-based “School Link” programs found in addition to the oral health benefit “providing sealant programs in all eligible, high-risk schools could reduce or eliminate racial and economic disparities in the prevalence of dental sealants.”²⁴ Many states have used government money to initiate sealant utilization programs to meet the objective delineated in the Healthy People 2010 document. Examples of community-based sealant promotion programs targeted to high-risk school children include the following:

- “Sealant Saturdays” in Salt Lake City, Utah²⁵
- “Dental Initiatives of the Academic Health Center” at the University of Minnesota²⁶
- “Dental Sealant Program” of the Department of State Health Services, Texas²⁷
- “Seal a Smile Program” of the Wisconsin Oral Health Program²⁸
- “Dental Sealant Grant Program” of the Illinois Department of Public Health²⁹
- “Rural School-based Oral Health Program for South Texas”³⁰

In order to reach the proposed objective, the utilization of dental sealants can be increased through public awareness, consumer education, and by establishing reimbursement by insurance companies. Healthcare providers, parents, and all consumers of healthcare need to understand oral health is an integral part of overall health. This awareness can be achieved through a public health initiative by educating dental consumers about the benefits of dental sealants at local family health clinics, daycare centers, and schools.^{3,31}

Outreach programs can only be successful if they are language appropriate to accommodate the cultural diversity of the nation. It is because “culture and ethnicity create a unique pattern of beliefs and perceptions as to what ‘health’ or ‘illness’ actually mean.”³² This pattern of beliefs will affect and influence how people perceive their needs for care and, in particular, the acceptance of dental sealants. As consumers are educated about the benefits of sealants, there may be an increase in consumer demand. For example, as effective consumer education and marketing strategies have influenced the utilization of the tooth whitening products, those same strategies could be utilized to promote dental sealant application.

Third-party payment has been another major determinant to dental sealant utilization. In 2001, a study³³ was done to determine how to achieve the Healthy People 2010 objective of 50% sealant application level in a population of citizens in the state of Alabama. It concluded the low insurance payment/claim ratio could be one of the obstacles to achieve the 50% application objective. This factor may influence sealant utilization in terms of dental providers not educating their patients or offering this service if it is not a reimbursable service in a patient’s insurance plan. Insurance guidelines may also impose limitations. For example, insurance companies impose age specifications and limit the reimbursement to cover permanent molars only. Some dental plans either fail to cover sealant application at all, restrict the application to once every five years, or even once for the lifetime of the tooth. If the third-party payers acknowledge the emerging paradigm of conservative dental care, they should be

willing to encourage the provision of preventive treatment.³⁴ The 2000 Surgeon General Report commented that “third-party payment system has to acknowledge its responsibility to compensate providers adequately to ensure that the next generation of conservative therapy can be enjoyed by the American people.”¹⁸ Same comments were noted by the Panel chair Michael C. Alfano, DMD, PhD of the 2001 NIH Consensus Development Conference, “that for the American people to benefit from these findings, insurance companies will need to change the way they compensate dental providers so that the next generation of conservative therapy can be enjoyed by everyone.”³

Conclusion

Dental decay is the most common chronic childhood disease. A simple, cost-effective preventive measure to manage this disease is through sealant application. In order to meet the national 50% sealant objective of the Healthy People 2010 document, dental professionals must increase public awareness and educate consumers about the benefit of having dental sealants. Also, dental professionals must lobby to insurance companies so the compensation for sealant applications will be adequate. With these approaches, the utilization of dental sealants will improve the oral health among the next generation of Americans.

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