

Executive summary of evidence-based clinical recommendations for the use of pit-and-fissure sealants

A report of the American Dental Association Council on Scientific Affairs

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The American Dental Association Council on Scientific Affairs convened a panel of experts to evaluate the collective evidence and develop evidence-based clinical recommendations on pit-and-fissure sealants. This is the executive summary of the full report, "Evidence-Based Clinical Recommendations for the Use of Pit-and-Fissure Sealants: A Report of the American Dental Association Council on Scientific Affairs," which is published in the March 2008 issue of *The Journal of the American Dental Association* and which is available online at "jada.ada.org".

These recommendations regarding use of pit-and-

fissure sealants are provided as a resource to oral health care professionals. The purpose of this document is to provide a critical evaluation and summary of the relevant scientific evidence and to provide recommendations that will assist clinicians with their decision-making process.

These recommendations are not a standard of care, but rather a useful tool that can be applied in making evidence-based decisions about sealant use. The recommendations should be integrated with the practitioner's professional judgment and the individual patient's needs and preferences.

GRADING THE EVIDENCE AND CLASSIFYING THE STRENGTH OF THE RECOMMENDATIONS

The expert panel classified the scientific evidence according to the following format:

TABLE 1

System used for grading the evidence.*	
GRADE	CATEGORY OF EVIDENCE
Ia	Evidence from systematic reviews of randomized controlled trials
Ib	Evidence from at least one randomized controlled trial
IIa	Evidence from at least one controlled study without randomization
IIb	Evidence from at least one other type of quasiexperimental study, such as time series analysis or studies in which the unit of analysis is not the individual
III	Evidence from nonexperimental descriptive studies, such as comparative studies, correlation studies, cohort studies and case-control studies
IV	Evidence from expert committee reports or opinions or clinical experience of respected authorities

* Amended with permission of the BMJ Publishing Group from Shekelle and colleagues.¹

The expert panel classified the strength of the recommendations according to the following format:

TABLE 2

System used for classifying the strength of the recommendations.*	
CLASSIFICATION	STRENGTH OF RECOMMENDATIONS
A	Directly based on category I evidence
B	Directly based on category II evidence or extrapolated recommendation from category I evidence
C	Directly based on category III evidence or extrapolated recommendation from category I or II evidence
D	Directly based on category IV evidence or extrapolated recommendation from category I, II or III evidence

* Amended with permission of the BMJ Publishing Group from Shekelle and colleagues.¹

1. Shekelle PG, Woolf SH, Eccles M, Grimshaw J. Clinical guidelines: developing guidelines. *BMJ* 1999;318(7183):593-596.

2. American Dental Association, U.S. Food and Drug Administration. The selection of patients for dental radiographic examinations. Revised 2004. "www.ada.org/prof/resources/topics/radiography.asp". Accessed Jan. 12, 2008.

TABLE 3

Summary of evidence-based clinical recommendations regarding pit-and-fissure sealants.

The clinical recommendations in this table are a resource for dentists to use in clinical decision making. These clinical recommendations must be balanced with the practitioner’s professional judgment and the individual patient’s needs and preferences.

Dentists are encouraged to employ caries risk assessment strategies to determine whether placement of pit-and-fissure sealants is indicated as a primary preventive measure. The risk of experiencing dental caries exists on a continuum and changes across time as risk factors change. Therefore, caries risk status should be re-evaluated periodically. Manufacturers’ instructions for sealant placement should be consulted, and a dry field should be maintained during placement.

TOPIC	RECOMMENDATION	GRADE OF EVIDENCE	STRENGTH OF RECOMMENDATION
Caries Prevention	Sealants should be placed in pits and fissures of children’s primary teeth when it is determined that the tooth, or the patient, is at risk of developing caries*†	III	D
	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 developing caries*†	Ia	B
	Sealants should be placed on pits and fissures of adults’ permanent teeth when it is determined that the tooth, or the patient, is at risk of developing caries*†	Ia	D
Noncavitated Carious Lesions‡	Pit-and-fissure sealants should be placed on early (noncavitated) carious lesions, as defined in this document, in children, adolescents and young adults to reduce the percentage of lesions that progress‡	Ia	B
	Pit-and-fissure sealants should be placed on early (noncavitated) carious lesions, as defined in this document, in adults to reduce the percentage of lesions that progress‡	Ia	D
Resin-Based Versus Glass Ionomer Cement	Resin-based sealants are the first choice of material for dental sealants	Ia	A
	Glass ionomer cement may be used as an interim preventive agent when there are indications for placement of a resin-based sealant but concerns about moisture control may compromise such placement§	IV	D
Placement Techniques	A compatible¶ one-bottle bonding agent, which contains both an adhesive and a primer, may be used between the previously acid-etched enamel surface and the sealant material when, in the opinion of the dental professional, the bonding agent would enhance sealant retention in the clinical situation§	Ib	B
	Use of available self-etching bonding agents, which do not involve a separate etching step, may provide less retention than the standard acid-etching technique and is not recommended	Ib	B
	Routine mechanical preparation of enamel before acid etching is not recommended	IIb	B
	When possible, a four-handed technique should be used for placement of resin-based sealants	III	C
	When possible, a four-handed technique should be used for placement of glass ionomer cement sealants	IV	D
	The oral health care professional should monitor and reapply sealants as needed to maximize effectiveness	IV	D

* Change in caries susceptibility can occur. It is important to consider that the risk of developing dental caries exists on a continuum and changes across time as risk factors change. Therefore, clinicians should re-evaluate each patient’s caries risk status periodically.

† Clinicians should use recent radiographs, if available, in the decision-making process, but should not obtain radiographs for the sole purpose of placing sealants. Clinicians should consult the American Dental Association/U.S. Food and Drug Administration² guidelines regarding selection criteria for dental radiographs.

‡ “Noncavitated carious lesion” refers to pits and fissures in fully erupted teeth that may display discoloration not due to extrinsic staining, developmental opacities or fluorosis. The discoloration may be confined to the size of a pit or fissure or may extend to the cusp inclines surrounding a pit or fissure. The tooth surface should have no evidence of a shadow indicating dental caries, and, if radiographs are available, they should be evaluated to determine that neither the occlusal nor the proximal surfaces have signs of dental caries.

§ These clinical recommendations offer two options for situations in which moisture control, such as with a newly erupted tooth at risk of developing caries, patient compliance or both are a concern. These options include use of a glass ionomer cement material or use of a compatible one-bottle bonding agent, which contains both an adhesive and a primer. Clinicians should use their expertise to determine which technique is most appropriate for an individual patient.

¶ Clinicians should consult with the manufacturer of the adhesive and/or sealant to determine material compatibility.



Figure 1. Tooth surface with an early (noncavitated) carious lesion that exhibits a white demineralization line around the margin of the pit and fissure and/or a light brown discoloration within the confines of the pit-and-fissure area. Image provided courtesy of Dr. Amid I. Ismail, the Detroit Dental Health Project (National Institute of Dental and Craniofacial Research grant U-54 DE 14261-01).

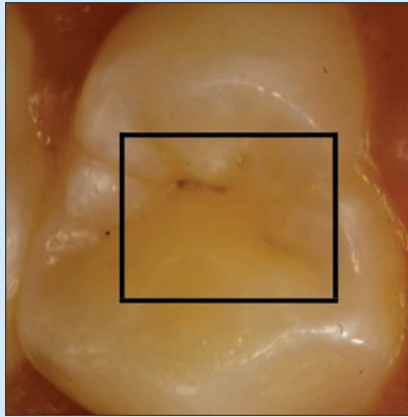


Figure 2. A small, distinct, dark brown early (noncavitated) carious lesion within the confines of the fissure. Image provided courtesy of Dr. Amid I. Ismail, the Detroit Dental Health Project (National Institute of Dental and Craniofacial Research grant U-54 DE 14261-01).

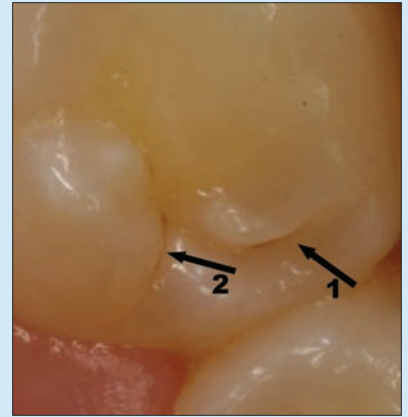


Figure 3. A deep fissure area (arrow 1) and another area exhibiting a small light brown pit and fissure (arrow 2). Note that the lesion does not extend beyond the confines of the pit and fissure. Image provided courtesy of Dr. Amid I. Ismail, the Detroit Dental Health Project (National Institute of Dental and Craniofacial Research grant U-54 DE 14261-01).

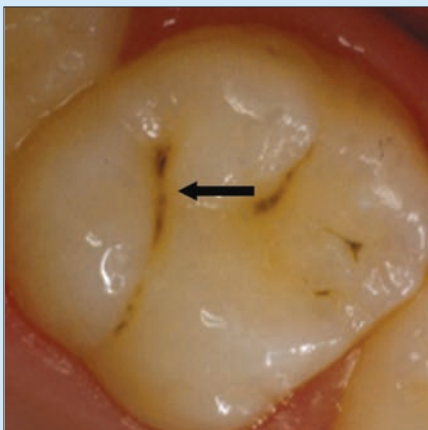


Figure 4. A more distinct early (noncavitated) carious lesion (arrow) that is larger than the normal anatomical size of the fissure area. Image provided courtesy of Dr. Amid I. Ismail, the Detroit Dental Health Project (National Institute of Dental and Craniofacial Research grant U-54 DE 14261-01).

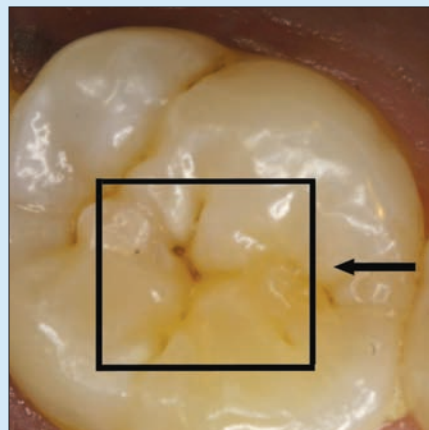


Figure 5. A more distinct early (noncavitated) carious lesion (arrow) that is larger than the normal anatomical size of the fissure area. Image provided courtesy of Dr. Amid I. Ismail, the Detroit Dental Health Project (National Institute of Dental and Craniofacial Research grant U-54 DE 14261-01).

THE EXPERT PANEL

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