

# Evidence-Based Clinical Practice Guideline on Restorative Treatments for Caries Lesions: A Report from the American Dental Association

Summary of clinical recommendations for carious tissue removal and direct restorative materials for caries lesions on vital, non-endodontically treated permanent teeth

## GRADE Certainty of the Evidence

<b>High</b>	We are very confident that the true effect lies close to that of the estimate of the effect.
<b>Moderate</b>	We are moderately confident in the effect estimate. The true effect is likely to be close to the estimate of the effect.
<b>Low</b>	Our confidence in the effect estimate is limited.
<b>Very Low</b>	We have very little confidence in the effect estimate.

## GRADE Interpretation of Strength of Recommendations

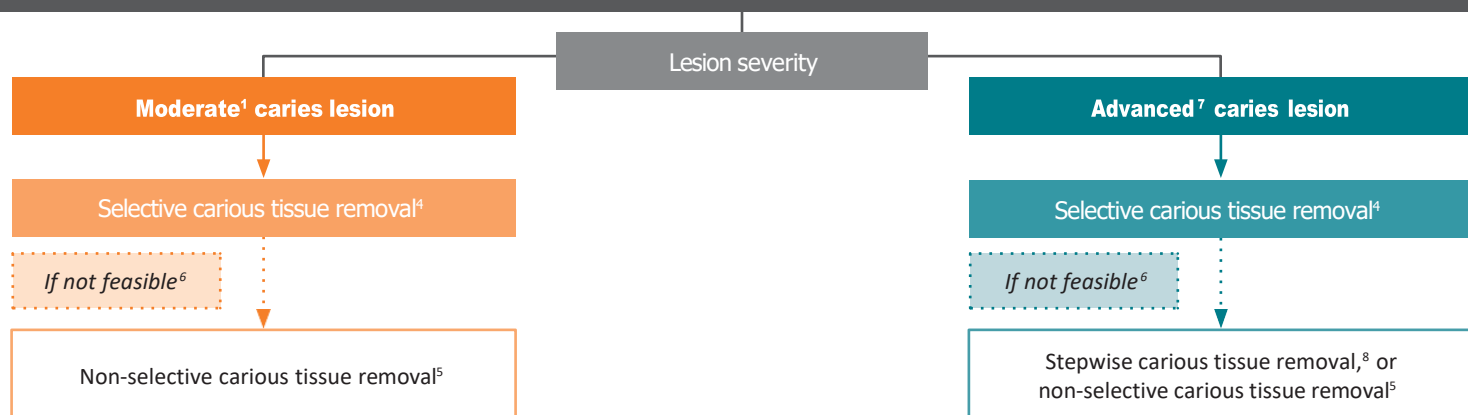
Implications	Strong Recommendations	Conditional Recommendations
<b>For Patients</b>	Most individuals in this situation would want the recommended course of action and only a small proportion would not.	The majority of individuals in this situation would want the suggested course of action, but many would not.
<b>For Clinicians</b>	Most individuals should receive the intervention.	Recognize that different choices will be appropriate for individual patients and that you must help each patient arrive at a management decision consistent with his or her values and preferences.
<b>For Policy Makers</b>	The recommendation can be adapted as policy in most situations.	Policy making will require substantial debate and involvement of various stakeholders.

Clinical scenario	Expert Panel Recommendations and Good Practice Statement	Certainty of the Evidence	Strength of Recommendation
<b>Cariou tissue removal approaches in permanent teeth</b>	To treat <b>moderate<sup>1</sup> caries lesions</b> on vital, permanent teeth requiring a restoration, regardless of direct restorative material <sup>2</sup> and means to remove carious tissue, <sup>3</sup> and without pulp therapy, the guideline panel suggests <b>prioritizing the use of selective carious tissue removal<sup>4</sup> over non-selective carious tissue removal.</b> <sup>5, 6</sup>	<b>Very low</b>	Conditional
	To treat <b>advanced<sup>7</sup> caries lesions</b> on vital, permanent teeth requiring a restoration, regardless of direct restorative material <sup>2</sup> and means to remove carious tissue, <sup>3</sup> and without pulp therapy, the guideline panel suggests <b>prioritizing the use of selective carious tissue removal<sup>4</sup> over stepwise carious tissue removal<sup>9</sup> or non-selective carious tissue removal.</b> <sup>5, 6</sup>	<b>Very low</b>	Conditional
<b>Direct restorative materials for permanent teeth</b>	For moderate <sup>1</sup> and advanced <sup>7</sup> caries lesions on vital, <b>anterior</b> , permanent teeth requiring a <b>Class I</b> (lingual pit and fissure) restoration, regardless of carious tissue removal approach, <sup>9</sup> and without pulp therapy, the guideline panel <b>suggests the use of either conventional GIC, hybrid resin composite, or resin-modified GIC.</b> <sup>10-12</sup>	<b>Very low</b>	Conditional
	For moderate <sup>1</sup> and advanced <sup>7</sup> caries lesions on vital, <b>anterior</b> , permanent teeth requiring a <b>Class III</b> (approximal) restoration, regardless of carious tissue removal approach, <sup>9</sup> and without pulp therapy, the guideline panel <b>suggests the use of either nanocomposite or hybrid resin composite.</b> <sup>10</sup>	<b>Very low</b>	Conditional
	For moderate <sup>1</sup> and advanced <sup>7</sup> caries lesions on vital, <b>anterior</b> , permanent teeth requiring a <b>Class V</b> (cervical third of facial or lingual) restoration, regardless of carious tissue removal approach, <sup>9</sup> and without pulp therapy, the guideline panel suggests <b>the use of either conventional GIC, hybrid resin composite, or resin-modified GIC.</b> <sup>10-12</sup>	<b>Very low</b>	Conditional
	For moderate <sup>1</sup> and advanced <sup>7</sup> caries lesions on vital, <b>posterior</b> , permanent teeth requiring a <b>Class I</b> (pit and fissure) restoration, regardless of carious tissue removal approach, <sup>9</sup> and without pulp therapy, the guideline panel suggests <b>prioritizing the use of conventional GIC, dental amalgam, resin composite, or resin-modified GIC over compomer.</b> <sup>5, 11-14</sup>	<b>Very low</b>	Conditional
	For moderate <sup>1</sup> and advanced <sup>7</sup> caries lesions on vital, <b>posterior</b> , permanent teeth requiring a <b>Class II</b> (approximal) restoration, regardless of carious tissue removal approach, <sup>9</sup> and without pulp therapy, the guideline panel suggests <b>prioritizing the use of dental amalgam, resin composite, or resin-modified GIC over conventional GIC.</b> <sup>5, 12-15</sup>	<b>Very low</b>	Conditional
	For moderate <sup>1</sup> and advanced <sup>7</sup> caries lesions on vital, <b>posterior</b> , permanent teeth requiring a <b>Class V</b> (cervical third of facial or lingual) restoration, regardless of carious tissue removal approach, <sup>9</sup> and without pulp therapy, the guideline panel suggests <b>the use of either conventional GIC, hybrid resin composite, or resin-modified GIC.</b> <sup>10-12</sup>	<b>Very low</b>	Conditional
	For moderate <sup>1</sup> and advanced <sup>7</sup> <b>root caries</b> lesions on vital, <b>anterior and posterior</b> , permanent teeth requiring a restoration, regardless of carious tissue removal approach, <sup>9</sup> and without pulp therapy, the guideline panel suggests <b>the use of either resin-modified GIC or conventional GIC (conditional recommendation, low certainty).</b> <sup>10, 12</sup>	<b>Low</b>	Conditional
<b>Good practice statement:</b> The U.S. Food and Drug Administration recommends <b>not using dental amalgam in “children, especially those younger than six years of age; people with pre-existing neurological disease; people with impaired kidney function; [and] people with known heightened sensitivity (allergy) to mercury or other components (silver, copper, tin)” wherever possible.</b> <sup>16</sup>			

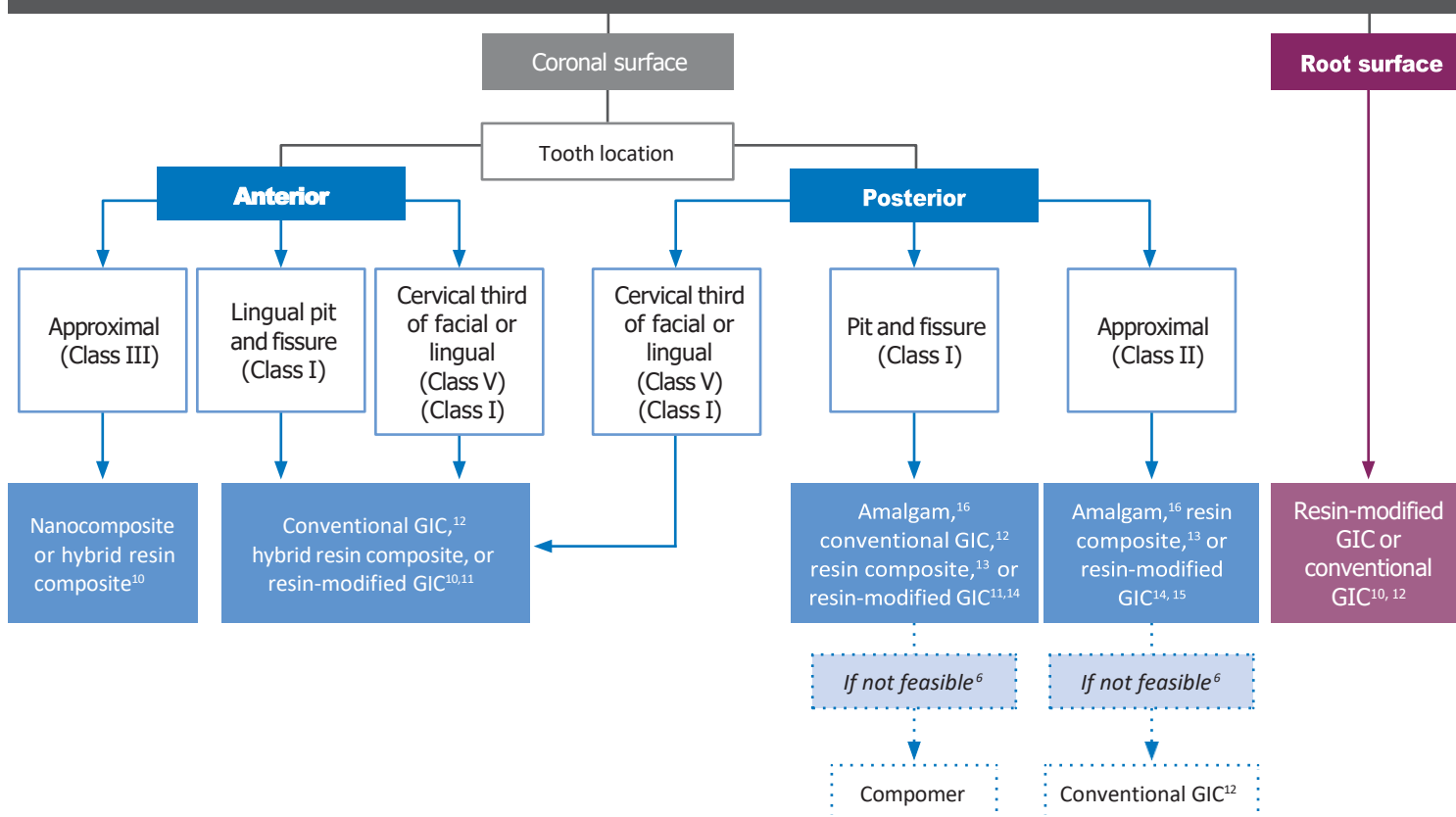
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## Caries removal approaches<sup>9</sup> on permanent teeth



## Direct restorative materials<sup>2</sup> for permanent teeth



1 Moderate caries lesion is defined as International Caries Detection and Assessment System (ICDAS) codes 3 and 4.

2 Direct restorative materials are limited to the use of dental amalgam, compomer, conventional GIC, resin composites (i.e., hybrid resin composite, macrofilled resin composite, and nanocomposite), and resin-modified GIC.

3 Means to remove carious tissue is defined as mechanical or chemo-mechanical.

4 Selective carious tissue removal is defined as carious tissue being removed until soft or firm dentin is reached. Also known as partial or incomplete caries removal.

5 Non-selective carious tissue removal is defined as carious tissue being removed until hard dentin is reached. Also known as complete caries removal.

6 The prioritization of interventions in this recommendation is a ranking determined by the panel due to their effectiveness, patients' values and preferences, resources required, acceptability, and feasibility.

7 Advanced caries lesion is defined as ICDAS codes 5 and 6.

8 Stepwise carious tissue removal is defined as carious tissue being first removed until soft dentin is reached and then a temporary restoration is placed. Months later, the restoration and carious tissue are removed until firm dentin is reached and a permanent restoration is then placed. Also known as two-step caries removal.

9 Carious tissue removal approach is defined as the extent of carious tissue removed.

10 The guideline panel assigned no prioritization among the recommended interventions.

11 Conventional and resin-modified GIC may be preferable when tooth isolation cannot be achieved, in patients with special healthcare needs, or in patients lacking predictable access to care.

12 Conventional GIC may be preferable when light-curing is not feasible.

13 Resin composites refer to hybrid resin composite, macrofilled resin composite, and nanocomposite.

14 The guideline panel assigned no ranking among the prioritized interventions.

15 Resin-modified GIC may be preferable when tooth isolation cannot be achieved, in patients with special healthcare needs, or in patients lacking predictable access to care.

16 FDA Issues Recommendations for Certain High-Risk Groups Regarding Mercury-Containing Dental Amalgam. [FDA Issues Recommendations for Certain High-Risk Groups Regarding Mercury-Containing Dental Amalgam | FDA](#) [Accessed 1 Oct 2024].