

CADTH RAPID RESPONSE REPORT: REFERENCE LIST

Composite Resin Versus Amalgam for Dental Restorations: Clinical Effectiveness and Safety

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Questions or requests for information about this report can be directed to requests@cadth.ca

Research Questions

1. What is the comparative efficacy of direct dental restorations made of composite resin versus amalgam for the treatment of dental caries in permanent posterior teeth?
2. What is the comparative safety of dental restorations made of composite resin versus amalgam in children and adults?

Key Findings

No literature was identified regarding the comparative efficacy of direct dental restorations made of composite resin versus amalgam for the treatment of dental caries in permanent posterior teeth. Furthermore, no literature was identified regarding the comparative safety of dental restorations made of composite resin versus amalgam in children and adults.

Methods

This report is an update of a literature search strategy developed for a previous CADTH report. For the current report, a limited literature search was conducted on key resources including PubMed, the Cochrane Library, University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused internet search. No filter was used for the comparative effectiveness component of the research question. A filter was applied to limit the retrieval by study type for the safety component of the research question. The initial search alerts ended in February 2018. For the current report, database searches were rerun on March 10th, 2020 to capture any articles published since the last alert date. The search of major health technology agencies was also updated to include documents published since February 2018.

Selection Criteria

One reviewer screened citations and selected studies based on the inclusion criteria presented in Table 1.

Table 1: Selection Criteria

Population	<p>Q1: Permanent, posterior teeth affected by dental caries (patients of any age)</p> <p>Q2: Dental caries patients of any age who have been exposed to dental restorations made of composite resin and/or amalgam</p>
Interventions	<p>Q1: Direct, composite resin dental filling restorations, including consideration of application techniques</p> <p>Q2: Composite resin as a restorative material for dental caries, including (where reported) consideration of surface areas; i.e., number of:</p> <ul style="list-style-type: none"> - restored surface areas - surface years
Comparators	<p>Q1: Direct dental amalgam filling restorations, including consideration of application techniques:</p> <ul style="list-style-type: none"> - bonded and unbonded - application of pins - surface areas restored <p>Q2: Amalgam as a restorative material for dental caries including (where reported) consideration of surface areas; i.e., number of:</p> <ul style="list-style-type: none"> - restored surface areas

	<ul style="list-style-type: none"> - surface years
Outcomes	<p>Q1: Clinical efficacy, as defined by the following outcomes:</p> <p>Primary outcomes:</p> <ul style="list-style-type: none"> - restoration failure rate <p>Secondary outcomes (i.e., reasons for failure):</p> <ul style="list-style-type: none"> - secondary caries, - restoration fracture tooth fracture <p>Q2: All adverse events, including:</p> <ul style="list-style-type: none"> - toxicity - sensitivity - allergic reaction - injury
Study Designs	Health technology assessments, systematic reviews, randomized controlled trials, non-randomized studies

Results

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports and systematic reviews are presented first. These are followed by randomized controlled trials and non-randomized studies.

No relevant health technology assessments, systematic reviews, randomized controlled trials, or non-randomized studies were identified regarding the comparative efficacy of direct dental restorations made of composite resin versus amalgam for the treatment of dental caries in permanent posterior teeth, or the comparative safety of dental restorations made of composite resin versus amalgam in children and adults.

References of potential interest are provided in the appendix.

Health Technology Assessments

No literature identified.

Systematic Reviews and Meta-analyses

No literature identified.

Randomized Controlled Trials

No literature identified.

Non-Randomized Studies

No literature identified.

Appendix — Further Information

Previous CADTH Reports

1. Khangura SD, Seal K, Esfandiari S, et al. Composite Resin Versus Amalgam for Dental Restorations: A Health Technology Assessment (*CADTH Health Technology Assessment*). Ottawa (ON); CADTH: 2018:
Available from:
<https://cadth.ca/sites/default/files/pdf/feedback/HT0021-Dental-Amalgam.pdf>
Accessed 2020 Mar 13

Systematic Reviews and Meta-analyses

Alternative Outcome

2. Aires CW, Pedrotti D, Lenzi TL, Soares FZM, Ziegelmann PK, Rocha RO. Is there a best conventional material for restoring posterior primary teeth? A network meta-analysis. *Pesqui Odontol Bras*. 2018 Mar 01;32:e10.
[PubMed: PM29513886](#)
3. Chisini LA, Collares K, Cademartori MG, et al. Restorations in primary teeth: a systematic review on survival and reasons for failures. *Int J Paediatr Dent*. 2018 Mar;28(2):123-139.
[PubMed: PM29322626](#)

Upcoming Systematic Review

4. Probst LF, da Silva E, Pereira A, Neves, J. Are dental amalgam fillings safe to patients, oral health professionals and environment? A systematic review. *PROSPERO: International prospective register of systematic reviews*. York (GB): University of York Centre for Reviews and Dissemination; 2019.
Available from:
https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42019129797
Accessed 2020 March 13

Non-Randomized Studies

Mixed Intervention

5. Palotie U, Vehkalahti MM. Type and time of first re-intervention of posterior restorations - 13-year scenario at the public dental service. *Acta Odontol Scand*. 2020 Feb 19:1-7.
[PubMed: PM32072834](#)

Alternative Outcome

6. Lin PY, Wang J, Chiang YC, Lai CY, Chang HJ, Chi LY. Risk of subsequent attention-deficit/hyperactivity disorder among children and adolescents with amalgam restorations: A nationwide longitudinal study. *Community Dent Oral Epidemiol*. 2018 02;46(1):47-53.
[PubMed: PM28782290](#)

7. Yong JB, Sivarajan S, Abbott PV. An analysis of the timing and materials associated with pulp disease following restorative dental treatment. *Int Endod J.* 2018 Dec;51(12):1327-1335.
[PubMed: PM29779218](#)

Review Articles

8. Uttarwar V, Gunwal M, Sonarkar S, et al. Clinical Longevity of Dental Amalgam V/S Resins Based Composites – A Literature Review. *IOSR Jnl of Dental and Med Sci.* 2019; 18(5): 62-64
Available from: <http://www.iosrjournals.org/iosr-jdms/papers/Vol18-issue5/Series-15/H1805156264.pdf> Accessed 2020 Mar 13
<http://www.iosrjournals.org/iosr-jdms/papers/Vol18-issue5/Series-15/H1805156264.pdf>