INAHTA Brief

Issue 2018/003

Title Composite Resin Versus Amalgam for Dental Restorations: A Health Technology Assessment

Agency CADTH Suite 600, 865 Carling Avenue, Ottawa, Ontario, Canada, K1S 5S8
Phone: 1 613 226 2553, Fax: 1 613 226 5392; www.cadth.ca

Reference Composite Resin Versus Amalgam for Dental Restorations: A Health Technology Assessment. Ottawa: CADTH; 2018 Mar. Available from: https://www.cadth.ca/dental-amalgams-compared-composite-resin

Aim

The objective of this health technology assessment is to inform a policy question asking whether dental amalgam should continue to be used in Canada. To do this, the health technology assessment addressed the comparative efficacy, longevity and safety, cost-consequence, patient perspectives and experience, environmental, ethical and implementation issues of dental restorations made of amalgam versus composite resin (i.e., the most commonly used alternative in Canada) for the treatment of dental caries.

Conclusions and results

The overall evidence from the assessment of clinical efficacy indicated that restorations made from dental amalgam last longer compared with those made from composite resin. With regard to safety and/or harms, the clinical review found no evidence of a clinically important difference between amalgam and composite resin dental restorations. The cost-consequence analysis indicated that, on average, amalgam restorations have a longer life and cost less than composite resin restorations. Findings from the reviews of patient perspectives and experiences, implementation, as well as environmental and ethical issues highlighted important considerations to further support shared decision-making for patients and clinicians considering which type of dental restoration may be most beneficial. These considerations included: patient profile and perceptions of dental materials; aesthetic considerations; funding and reimbursement models (including public versus private clinical settings); fair and equitable patient access; and a small relative impact of dental amalgam to Canada's overall burden of mercury, with limited evidence describing the environmental impact of composite resin.

Methods

To assess clinical outcomes, efficacy was assessed by updating a 2014 Cochrane systematic review, and safety was assessed by conducting a de novo review and a narrative synthesis of the literature. A cost-consequence analysis was conducted to evaluate the comparative consequences and costs associated with composite resin and amalgam as restorative materials for permanent, posterior teeth, within a Canadian societal perspective.

For patient perspectives and experiences, a literature review and synthesis of published qualitative studies was performed. To understand the current context and implementation issues associated with the use of dental amalgams and composite resin fillings in Canadian dental care settings, telephone consultations, and a review of the published literature were conducted. A literature search was also conducted to inform a comparative assessment of potential environmental effects associated with the use of dental amalgams versus composite resins. And finally, an ethics analysis of published literature was performed, drawing primarily from utilitarian/consequentialist and the deontological/duty-based approaches, to describe ethical, legal and social issues relevant to the comparison of dental amalgam and composite resin.

Further research/reviews required

Given long-standing questions surrounding the safety of amalgam, and remaining uncertainty around the health and environmental effects of compounds contained in composite resin, additional comparative studies of higher quality assessing the efficacy and safety of dental amalgam and composite resin are still needed. Notably, investments into innovation and development are also an important consideration; for example, continued research and development into restorative dental materials that can demonstrate improved efficacy and safety compared with those currently used in contemporary dentistry. Importantly, more research into implementation issues, environmental impact, patient perspectives, and interventions to support shared clinical decision-making is necessary.

Written by

CADTH, Canada