

Which filling material is best in the primary dentition?

Abstracted from

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Dental fillings for the treatment of caries in the primary dentition.
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Question: Which filling material should be used for the treatment of caries in the primary dentition?

Data sources The Cochrane Oral Health Group’s specialised trial register (Cochrane Central Register of Controlled Trials) was searched along with Medline, Embase and the System for Information on Grey Literature in Europe, along with proceedings from conferences on early childhood caries, restorative materials for paediatric dentistry, and material sciences conferences for dental materials used for children’s dentistry. There were no language restrictions. Additionally, the reference lists from articles of eligible papers were searched, and handsearches made of the journals *Operative Dentistry*, *Journal of Restorative Dentistry*, *Pediatric Dentistry*, *Journal of Clinical Pediatric Dentistry*, and the *International Journal of Paediatric Dentistry*. Authors and manufacturers of dental materials were individually contacted.

Study selection Randomised controlled trials (RCT) or quasi-RCT with a minimum period of 6 months’ followup were included. Both parallel group and split-mouth study designs were considered. The unit of randomisation could be the individual, group (school, school class, etc), tooth or tooth pair. Included studies had a dropout rate of less than 30%. The eligible trials consisted of young children (children aged less than 12 years) with tooth decay involving at least one tooth in the primary dentition which was symptomatic or symptom-free at the start of the study.

Data extraction and synthesis Data were independently extracted, in duplicate, by two review authors. Disagreements were resolved by consultation with a third review author. Authors were contacted for missing or unclear information regarding randomisation, allocation sequence, presentation of data, etc. A quality assessment of included trials was undertaken. The Cochrane Collaboration statistical guidelines were followed for data analysis.

Results Only three studies were included in this review. One study assessed the clinical performance of aesthetic crowns versus conventional stainless steel crowns in 11 children who had at least

two mandibular primary molars that required a crown restoration. The outcomes assessed at 6 months included gingival health restoration failure occlusion, proximal contact and marginal integrity. The second (split-mouth) study compared a resin-modified glass ionomer with amalgam over a 36-month period. Forty pairs of Class II restorations were placed in 40 patients (21 males and 19 females; mean age 8 years ±1.17 years). Although the study period was 36 months, only the 6- and 12-month results are reported because of the loss to followup of patients being greater than 30% for the 24- and 36-month data. The third study recruited 30 patients (age range, 4–9 years) with one pair of primary molars that required a Class II restoration. The materials tested were a compomer and amalgam. Loss to followup at 24 and 36 months was 20% and 43% respectively. This meant that only the 24-month data were useable. For all of the outcomes compared in all three studies, there were no significant differences in clinical performance between the materials tested. No studies were found that compared restorations with extractions or with no treatment as an intervention in children with childhood caries.

Conclusions It was disappointing that only three trials that compared three different types of materials were suitable for inclusion into this review. There were no significant differences found in all three trials for all of the outcomes assessed. Well-designed RCT comparing the different types of filling materials for similar outcomes are urgently needed in dentistry. There was insufficient evidence from the three included trials to make any recommendations about which filling material to use.

Commentary

Dental caries remains the principal problem in dentistry, since it is still found in almost half of all children aged <12 years old in many countries.¹ In addition, there are several guidelines and recommendations (eg, see the *National Guideline Clearinghouse* website <http://bit.ly/aL1mhI>) about the treatment of dental decay in children, and they are clear regarding the materials and techniques to use in case of minor or extensive caries in children.

So, this systematic review addresses a very pertinent issue: what evidence is there about the use of dental filling materials for the treatment of caries in primary teeth? The aim of the systematic review is clear, as are the databases and search strategies used. Making my own Medline search, nevertheless, I found more than 10 possibly relevant papers that had not been included in (or had been expressly excluded from) this review, so there may be bias in the search strategy used by the authors.

This paper is based on a Cochrane Review published in The Cochrane Library 2010, issue 1 (see www.thecochranelibrary.com for information). Cochrane Reviews are regularly updated as new evidence emerges and in response to feedback, and The Cochrane Library should be consulted for the most recent version of the review.

The reviewers considered the risk of bias in the randomisation sequence, allocation concealment, blind outcome assessment and completeness of followup. Of 26 eligible papers, only three were found acceptable to be included in the analysis, all of them with high risk of bias. These included papers compared aesthetic versus stainless crowns, ionomer versus amalgam and compomer versus amalgam. None found any significant differences in the time of the study.

So what does this result mean for the clinician? On the one hand, it can be seen as a message to, “keep doing what you are doing” since there is no evidence of any better dental filling for dental caries in children. On the other hand, they could choose to use just the cheaper or easier methods or materials.

Given that carious teeth often result in pain and sepsis, good evidence on the most effective materials for filling deciduous teeth is important for clinicians — particularly in the light of some lower level observational evidence that found that the majority of painless carious primary teeth remained symptomless until shed² which,

in the absence of good evidence of effectiveness, may encourage nontreatment.

The main message, however, is for researchers. First, establish a gold standard for the treatment of dental caries in children and then compare any new product with a more rigorous clinical trial, adopting the CONSORT guidelines.³ This will be beneficial for all: dentistry, dentists and most of all for children.

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