



summary

Half of simple restorations last 10–20 years

MC Downer, NA Azli, R Bedi, DR Moles, DJ Setchell. *How long do routine dental restorations last? A systematic review. BDJ 1999; 187:432–439*

Objective To conduct a systematic review of the literature on the longevity of routine dental restorations in permanent posterior teeth and to identify and examine factors influencing its variability.

Data sources Medline, Embase, Cinhal, Dissertation Abstracts, and ERIC were searched from their inception as well as SCISearch and the Cochrane Controlled Trials Register (Issue 2 1998). Bibliographies of identified studies were searched and attempts to identify unpublished literature by contacting topic experts were made. Key search terms used dental restoration, longevity, failure, durability, survival analysis, life table analysis.

Study selection Studies relating to class I and II restoration in permanent teeth not requiring any additional form of retention were included. Independent assessment of the studies was carried out and levels of agreement assessed using Kappa. When agreements could not be resolved studies were excluded.

Results Eight of 58 relevant research reports met the inclusion criteria. They suggested that 50% of all restorations last 10–20 years, although both higher and lower median survival times were reported. The findings were supported by the totality of studies reviewed. However, variability was substantial. Restoration type, materials, the patient, the operator, the practice environment and type of care system appeared to influence longevity.

Conclusion Many studies were imperfect in design. Those considered to be the most appropriate for analysis were too limited to undertake a formal statistical exploration. Therefore, there remains a need for definitive randomised controlled trials of restoration longevity, of sound design and adequate power, employing standardised assessments and appropriate methods of analysis.

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Commentary

The longevity of routine restorations has implications for patients, dentists, public dental health planners and materials scientists. In an attempt to address this question, the guidelines of the NHS Centre for Reviews and Dissemination at the University of York and of the Cochrane Collaboration were used in a literature review.

An exhaustive search was made to identify all the studies which assessed the longevity of Class I and Class II amalgams, resin composites and glass ionomers in permanent teeth. From 124 identified studies, 58 were short-listed, and a final selection of eight was made which met specific quality and validity criteria. This statistic highlights one of the main issues concerning clinical trials of dental materials, that of study design. The best evidence of restoration performance is the randomised clinical trial, but it is interesting

to note that six of the final eight studies selected were longitudinal retrospective designs.

Numerous other factors complicate this exercise. The initial number of patients and restorations examined in each paper, and their attrition rates, are not given, probably because of space constraints. However, the long survival time of some restorations means that, unless survival analysis was used, the results may be misleading. The authors discuss statistical issues at some length, and give guidance for other researchers. Median Survival Time (MST) is the best measure of restoration longevity, but the concept may not be easily understood by patients.

Developments in restorative materials and techniques present another complication. There have been many improvements in resin composites and glass ionomers in recent years, together with improvements in adhesive techni-

ques. Restorations placed today would be expected to last longer than those placed 10 years ago.

The authors have carried out a very difficult task using the best possible techniques, and have highlighted some of the key issues in clinical dental materials trials. There is some confusion regarding the way the initial short list of 58 reports and the final short list of eight reports have been used, in that restoration longevity has been discussed for both lists, but there is no clear explanation why.

It is hoped that those interpreting published studies and planning future studies will read this paper and appreciate the complexities and requirements of a valid research design.

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