

# Summary of: Influence of root canal fillings on longevity of direct and indirect restorations placed within the General Dental Services in England and Wales

## FULL PAPER DETAILS

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**Aim** To consider the survival of restorations in root filled and non-root filled teeth. **Methods** A data set was established consisting of patients, 18 years or older. For each patient on the database with a tooth restored with a direct or indirect restoration with or without a root filling, the subsequent history of intervention on that tooth was consulted, and the next date of intervention, if any could be found in the data set, was obtained. Thus a data set was created of restored teeth and whether they have also received root fillings, with the dates of restoration and root filling placement and the dates, if any, of re-intervention. Modified Kaplan-Meier statistical analysis was used to quantify the distribution of time to intervention. **Results** Data for over 80,000 different adult patients were analysed, of whom 46% were male and 54% female. A total of 538,967 restoration placements were obtained from the data over a period of 11 years, of which 30,073 were root fillings. **Conclusions** Examination of the survival of restorations in teeth with and without root canal fillings indicated that those with root canal fillings have shorter intervals before re-intervention than teeth without root fillings. Restorations on root canal treated anterior teeth with post and cores had the lowest survival time.

## EDITOR'S SUMMARY

Real is something to be treasured and aspired to. Real coffee, the real travel experience, real mashed potato (in the USA; yes, honestly). We crave and strive for the real truth as being the ultimate and the pure in any particular human endeavour. So the tantalising prospect of real data on the outcome of clinical treatment has to be a moment to savour.

This paper provides such an instance as far as any research and analysis can in practical terms. It takes two to tell the truth and it takes a research project with many caveats to attempt to reach a similar level of veracity. In the *BDJ* we rarely if ever publish *in vitro* work on dental materials. While we recognise the value of this in the development and general testing of materials we feel that for the vast majority of our readers in clinical practice the important information relates to how materials and techniques fare in the real world. Human behaviour, saliva, changes in temperature, variations in mixing, vagaries of biological reaction all

serve to confuse and sometimes confound treatment in the longer term and it is only research or observation of what happens in everyday practice that can really shed light on actual outcomes.

Using a huge amount of data gathered over a comparatively long period of time, this paper is able to conclude that restorations in teeth with root fillings have a shorter time to re-intervention than those in teeth that are not root filled. Additionally, root filled teeth restored with crowns have a longer time to re-intervention than those restored with plastic materials. For some this might seem like common sense, a somewhat obvious finding. That is entirely in keeping with evidence from the real world; what experience teaches us, research can confirm.

What this also reinforces in my view is the standpoint that I have previously termed 'evidence-based anecdote', which is to add weight to the oft heard expression from experienced colleagues that a particular material or technique 'works well in my hands'. Which in turn means

that it has longevity and success for their patients. Perhaps this is one of those rare examples of science directly reflecting life; or the evidence confirming the 'real'.

The full paper can be accessed from the *BDJ* website ([www.bdj.co.uk](http://www.bdj.co.uk)), under 'Research' in the table of contents for Volume 216 issue 6.

Stephen Hancocks  
Editor-in-Chief

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**IN BRIEF**

- Examines the survival of restorations in root filled and non-root filled teeth.
- Suggests that teeth with root canal fillings have less time before re-intervention than teeth without root canal fillings.
- Suggests that teeth restored with crowns during the same course of treatment as the root canal filling was placed have a longer time before re-intervention than those restored with plastic restorations.

**COMMENTARY**

This study analysed a data set derived from payment claims submitted by GDS dentists to the Dental Practice Board in Eastbourne, Sussex, during the period January 1991 to March 2002. The data set was restricted to courses of treatment starting on or after the patient's eighteenth birthday, in which one or more teeth were restored with a direct or indirect restoration with or without a root canal filling on the same course of treatment (tunnel preparations were excluded). The data set included 491,404 teeth with direct restorations of which 22,434 teeth had root canal fillings. Of the 47,563 teeth that had crowns, 7,639 had root canal fillings. For each tooth receiving such treatment the next date of intervention on that tooth was noted, if any were found in the data. The merit of this data set is that it offers a window on 'real life' survival of restorations placed within the GDS. However, the limitations of the data set are many and are discussed by the authors in the full paper. For example, the interval between successive interventions is only a proxy for the 'life' of a restoration. Indeed, a need for re-intervention may have arisen due to a circumstance completely unrelated to the original intervention. The reasons for intervention and re-intervention were not available in the data set.

Additional difficulties were presented in the statistical analysis of this data, which again are debated by the authors. A commonly used technique for analysing incomplete survival data was developed by Kaplan and Meier. However, this could not be applied directly to the data in this study. Instead a modified Kaplan-Meier analysis was applied to allow for the probability that a patient would

eventually re-attend, dependent on the time from the last recorded attendance to the end of the observation period and the age of the patient.

Within the limitations of the study, the main findings were that restorations in teeth with root canal fillings have less time to re-intervention than teeth without root canal fillings. The reason for this is unknown but could be due to larger restorations in root canal filled teeth or a greater risk of tooth and restoration fracture. Root canal filled teeth restored with crowns have a longer time to re-intervention than root canal teeth restored with plastic restorations. Whether this was due to cuspal coverage or better coronal seal could not be determined.

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**AUTHOR QUESTIONS AND ANSWERS****1. Why did you undertake this research?**

The original database for this work was established in 1992 and, with *circa* 5,000,000 restorations followed for ten years, is capable of providing information on the factors influencing restoration longevity. It was therefore considered appropriate to investigate the influence of root canal fillings on longevity of direct and indirect restorations.

**2. What would you like to do next in this area to follow on from this work?**

A new database (of *circa* ten million restorations followed for 16 years) has been established using similar methodology to that used in the present work. Work has commenced to interrogate this database, as it should provide accurate and statistically significant information on the factors influencing restoration survival, which has not been possible to determine in the past.