Summary of: The survival of Class V restorations in general dental practice: part 3, five-year survival

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Objective To evaluate the survival over five years of Class V restorations placed by UK general practitioners, and to identify factors associated with increased longevity. **Design** Prospective longitudinal cohort multi-centre study. **Setting** UK general dental practices. **Materials and method** Ten general dental practitioners each placed 100 Class V restorations of varying sizes, using a range of materials and recorded selected clinical information at placement and recall visits. After five years the data were analysed using the Kaplan-Meier method, log-rank tests and Cox regressions models to identify significant associations between the time to restoration failure and different clinical factors. **Results** After five years 275/989 restorations had failed (27.8%), with 116 (11.7%) lost to follow-up. Cox regression analysis identified that, in combination, the practitioner, patient age, cavity size, moisture contamination and cavity preparation were found to influence the survival of the restorations. **Conclusions** At least 60.5% of the restorations survived for five years. The time to failure of Class V restorations placed by this group of dentists was reduced in association with the individual practitioner, smaller cavities, glass ionomer restorations, cavities which had not been prepared with a bur, moisture contamination, increasing patient age, cavities confined to dentine and non-carious cavities.

EDITOR'S SUMMARY

It is fascinating in life how very often it is the slightest of circumstances that reflect the largest dilemmas and problems. Arguably among the smallest of restorations (minimal intervention notwithstanding) Class V cavities present some unique challenges both to the materials scientist and to the clinician.

Also, with a greater number of people retaining more of their natural teeth for longer it is likely that we might see more of these cavities in future, meaning that some evidence-based solutions would be particularly useful. This study is of particular merit for dental clinicians in that it was conducted in practice settings and in addition was very thoroughly designed to account for as many variables as it is almost possible to anticipate and guard for.

However, what emerges from the procedure to restore such a 'niche' lesion way down by the gingival shoreline is a complex mix of factors including operator, age of patient, size and extent of cavity and material choice, to name but a few. Out of this it is reasonable to conclude that restorations placed in cavities prepared with a bur, which are small enough not to extend beyond the tooth's enamel and are created from resin modified glass ionomer (RMGI) material in a moisture free environment have the greatest longevity.

The authors note that there is a 60% survival rate after five years for the restorations in this study and this is hardly surprising given the very specific formula for success disclosed by the research. So, do we really feel that a 40% failure rate over the same time period is ideal? Can we

do better? Research of this kind certainly adds to our knowledge but the lingering concern is that, for example, if RMGI provides the best route to longevity why are so few practitioners selecting it? This is especially so given that other studies have also pointed to this. If we are to benefit from the evidence-base thrown-up by research then we have to be prepared to modify our behavior and not merely acknowledge the results while complacently continuing with existing habits which apparently 'work well in our hands'.

The full paper can be accessed from the *BDJ* website (www.bdj.co.uk), under 'Research' in the table of contents for Volume 212 issue 9.

Stephen Hancocks
Editor-in-Chief

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IN BRIEF

- This study reminds dentists that they are the most important factor determining the survival of Class V restorations.
- Presents evidence that has been collected from a large number of restorations placed in dental practices and is therefore likely to be particularly relevant to general practitioners.
- Identifies a number of factors associated with poor restoration survival which can help dentists improve their patient care.

COMMENTARY

The article by Stewardson *et al.* is the third part of an ample practice-based clinical trial that evaluated the survival of Class V restorations using different types of materials placed by clinicians in general practices. The merit of this publication is that several clinicians with different experience and years in practice participated in this study. Furthermore, the authors brilliantly designed and executed this clinical trial, analysing and correlating all the essential variables.

The authors found that the increase in patient's age and cavity size was directly related to increase in failure rate. In addition, this study confirms that restorations involving dentine and presence of moisture were associated with decrease in the survival rate of the restorations. Aside from that, the use of rotary instruments increased the survival rate of non-carious lesions. A plausible explanation to this outcome is that the cavity preparation increased the mechanical retention of the restoration, therefore increasing the longevity of the restoration.

The great majority of failure was complete loss of restoration and the lowest percentage of failure was due to recurrent caries. The loss of restoration might be attributed to the lateral excursive movements resulting in lateral cuspal movements generating tensile stresses along tooth restoration interface, suggested by the tooth flexure theory. The ten dentists who placed the restorations had the freedom to use materials which they felt appropriate

to each clinical situation. More background information on the clinicians would have been beneficial to better understand the material selection and outcome of the study, such as the number of years in practice, any special training, knowledge of the material employed and attendance to continuum education courses of each clinician.

Interestingly, greater proportions of carious lesions were filled with amalgam or RMGI than other materials. Furthermore, the time to failure of glass ionomer restorations was shorter than for the other materials and this was only significant for carious lesions. For non-carious lesions, the practitioner had a greater influence on survival than the choice of material. This study and others have shown that RMGI is the material of choice for Class V restorations, yet only two out of the ten clinicians employed this material. Dentists should consult the wealth of information available in order to make clinical decisions based on evidence.

To conclude, this elegant clinical trial presented that Class V lesions prepared with a bur, kept in enamel and as small as possible promote a reduction in time of failure. Hence, restorations placed with RMGI and under no moisture contamination have greater chances of survival.

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

The evidence which practitioners can call on to guide their clinical decisions is frequently limited to results from laboratory tests or clinical studies carried out by a small number of experienced operators working in protected environments. These studies may not reflect the clinical outcomes which will occur in the wider arena of daily practice. Practice-based research can provide this additional source of evidence. This project reflects an area of concern and interest recognised by dentists in practice. Practising dentists are probably better placed than academics to suggest research topics based on the problems and uncertainties which they experience and so we actively involved the dentists of BRIDGE in the design and execution of this project.

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

This study has demonstrated the potential of practice-based research to generate large data sets which are difficult to achieve through institutionally-based studies. We intend to continue setting up similar large scale studies to provide complementary evidence to that obtained through laboratory or smaller scale clinical studies which can be used to guide practicing dentists in their clinical decisions. We hope to build in more training and calibration of dentist participants to create a team of research-dentists who are more familiar with performing clinical trials. This will ensure a greater level of control and uniformity which will lead to more robust and defensible conclusions from our research.