

# Practice-based assessment

The PREP Panel evaluates 3M ESPE's RelyX Ultimate adhesive resin cement.

Luting materials are needed to fill the space (hopefully not more than 50 microns) between an indirect restoration and the tooth preparation. These may roughly be classified into:

- Active – in which the luting material actually helps to bond the restoration to the tooth, and,
- Passive – in which the luting material simply fills the space between the tooth and the restoration.

It may appear obvious that 'active' materials are to be preferred over 'passive' since the active luting materials may help make up for deficiencies in the retention of the preparation or a lack of height of the tooth being prepared. In this regard, the only truly active luting materials are those which are resin-based, as these can be used in combination with a dentine bonding agent.

Resin luting materials also exhibit advantages over traditional luting materials such as phosphate cement, or glass ionomer luting materials. They are insoluble in the dilute organic acids which are found in plaque (a major advantage, since plaque may be present at the gingival margin of crowned teeth where the luting material may be exposed) while materials such as phosphate and glass ionomer are not. Their physical properties are excellent and they are tooth coloured.

However, the uptake of resin luting materials was initially slow, other than for the placement of porcelain laminate veneers and resin-retained bridges, but they are now becoming much more widely accepted, with 45 per cent of a group of UK dental practitioners who responded to a survey stating that they used a resin luting material, and with



a higher proportion of dentists who had graduated <10 years using resin luting than dentists who had graduated earlier. By contrast, phosphate cement was still used by 28 per cent of respondents for single units and 26 per cent of respondents for multiple units.

It is therefore the purpose of this study to evaluate the handling characteristics of a newly-designed and recently-introduced resin luting material, 3M ESPE's RelyX Ultimate, when used by a group of UK general dental practitioners.

## Materials and methods

A questionnaire was designed jointly by the PREP Panel co-ordinators and the manufacturer of Rely X Ultimate (3M ESPE AG) in order to provide background information on the current usage of resin-based luting cements by the participating practitioners and to rate the presentation, instructions,

dispensing, ease of use and handling of the new material, with the majority of responses being given on a visual analogue scale (VAS).

All 33 members of the PREP Panel were sent a letter asking if they were prepared to evaluate a new resin-based luting system, with 12 members being selected at random from those who gave a positive response. All were male, and the average time since graduation was 23 years, with a range of 10 to 43 years. Explanatory letters, questionnaires and a pre-launch kit of Rely X Ultimate were sent to the evaluators, with a request that they use the materials, where indicated, for a period of two months. The kit contained four 8.5g syringes (one A1, one B0.5, 1 A3 and one Translucent) of the luting material, 3M ESPE Scotchbond Universal adhesive, try-in pastes plus mixing tips and instructions for use. The data from the returned questionnaires were then collated.

## FJ Trevor Burke

is co-ordinator of the primary dental care research group at the University of Birmingham.

## Russell J Crisp

is a member of the primary dental care research group at the University of Birmingham.

## Evaluation

When the evaluators were asked how many indirect, resin-retained (or resin-bonded) restorations, such as ➤

Composite and ceramic inlays and dentine-bonded crowns, they placed in a typical month, five evaluators stated that they placed less than five, five placed between six and 10, with two evaluators placing over 10 such restorations a month.

Regarding the clinical techniques that they used resin luting materials for, the evaluators stated that they placed fewer than five resin-retained bridges per month, while, in a typical month, eight of the evaluators stated they placed less than five porcelain veneers, with the remainder placing between six and 10. When the evaluators were asked how many other indirect restorations they placed in a typical month, the majority (n=7) placed over 10, three evaluators placed less than five and the remaining two placed between six and 10. The main reasons for the choice of their pre-study material were ease of use and good results.

Eight (67 per cent) of the evaluators used 'conventional' luting systems (including a resin-modified glass ionomer material) with the principal reasons for the choice of these materials being ease of use and good results. Other reasons stated were good working time, easy removal of excess and no post-operative sensitivity.

When the evaluators were asked to rate the overall ease of use of the resin luting system which they currently used the result was as follows:



When the evaluators were asked to rate the overall ease of use of the 'conventional' luting system if currently used, the result was as follows:



The evaluators rated the presentation of the various components as follows:

a) Overall layout of the pack



b) Ease of use of the bottle of Scotchbond Universal



c) Ease of use of the resin cement mixing syringes



#### Comments:

"Microbrushes too big to use in post holes – had to use 'mini' ones"

"It's a large box. I would not have found the syringes but for the fact my nurse opened it upside down!!" (two similar).

When the evaluators were asked to rate the draft laminated instructions, the result was as follows:



#### Comments from the evaluators:

"More written instructions under pictures would be helpful" and "Generally good but a little confusing with multiple options on multiple uses."

In the light of these comments, and similar ones from other sources, the manufacturer's modified the instructions for the market launch, which were then rescored by the evaluators as follows:



As RelyX Ultimate is indicated for cementation of zirconia restorations along with additional pre-treatment steps, the evaluators were asked if it was an advantage for the same luting material to be used for all indications and 92 per cent (n=11) stated that it was.

The same number (92 per cent) also considered it advantageous to be able to use Scotchbond Universal adhesive both for bonding to the tooth and as a silane and restoration primer.

#### Comments from the evaluators:

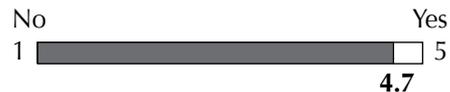
"A single luting material is better than a drawer of different types" and "Great to have one box to do all."

A total of 143 restorations were placed using RelyX Ultimate and when the evaluators were asked to rate their (and also their dental nurses') assessment of the dispensing and handling of the system, the result was as follows:



Ten (83 per cent) of the evaluators stated that the number of shades available was sufficient and seven (58 per cent) of the evaluators used the RelyX Try-in pastes contained in the kit: of these, six (86 per cent) stated that the pastes were useful.

The evaluators were asked to rate if the flow of the material was satisfactory when pressure was applied during placement of indirect restorations, with the following result:



The viscosity of the material was rated by the evaluators as follows:



When the evaluators were asked to rate the overall ease of use of RelyX Ultimate, the result was as follows:



When the evaluators were asked to describe how RelyX Ultimate compared with the resin luting material previously used, all the evaluators described it as similar or better handling and 83 per cent (n=10) described the working time as similar or better.

Ten (83 per cent) of the evaluators stated that they would purchase the material if available at average cost ➔

and nine (75 per cent) would also recommend RelyX Ultimate to colleagues.

#### **Final comments included:**

"The syringe and mixing tips provided make life very easy, particularly when cementing multiple units – nice product" (two similar)

"I enjoyed using this material. I feel it fills a need in my practice where it utilises the clinical benefits of resin-based cements with ease of use"

"Worked well for post cementation. Great to have all in one box!"

#### **Discussion**

The overall layout of the pack and ease of use of the bottle of Scotchbond Universal and the resin cement syringes scored highly (3.9, 4.4 and 4.6 respectively on a visual analogue scale where 5 = excellent and 1 = poor). RelyX Ultimate was rated similar by the evaluators for overall ease of use when compared with the normally used resin-based cementation system, (4.3 v 4.2 on a visual analogue scale where 5 = easy to use and 1 = difficult to use). When asked how much they liked the convenience of the handling and dispensing of the system they gave a score of 4.9 (5 = convenient, 0 = inconvenient). Comments made regarding the draft form of the laminated instruction card indicate that the layout could be further improved and this was duly implemented by the manufacturers. An ideal score for viscosity (3.0 on a visual analogue scale where 5 = too viscous and 1 = too thin) was achieved by RelyX Ultimate and 92 per cent of the evaluators stated the ability to use the same luting material for all indications was a clinical advantage. The same number (92 per cent) also considered it an advantage to be able to use the

Scotchbond Universal bonding agent for bonding to tooth and also as a silane and restoration primer. The use of RelyX Ultimate and Scotchbond Universal without prior polymerisation was said by one evaluator to be the "absolute highlight". Not all evaluators used the try-in pastes but of the seven who did 86 per cent stated that these pastes were useful. Ten (83 per cent) of the evaluators would purchase RelyX Ultimate and the nine (75 per cent) would recommend the system to colleagues.

#### **Conclusions**

The good reception of this new material is underlined by the number of evaluators who stated that they would both purchase the system and recommend it to colleagues.

#### **Manufacturer's comments**

We would like to thank the prep panel evaluators as well as the organisers for their timely and invaluable feed-back pre-launch. It allowed us to improve and clarify the instructions for use to a design that was even easier to comprehend. Also the positive clinical feed-back on having provided ease of use combined with the advantages of an adhesive luting system confirmed our initial objective for the development of RelyX Ultimate Adhesive Resin Cement. In the meantime the product has been launched and continues to yield positive feed-back from our customers.

#### **References**

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2. Brunton PA, Sharif MO, Creanor S, Burke FJT, Wilson NHF. Contemporary dental practice in the UK in 2008: indirect restorations and fixed prosthodontics. *Br Dent J* 2012; 212: 115–119.