

# A practice-based clinical evaluation

Trevor Burke and Russell Crisp present the PREP Panel's evaluation of Voco Ionolux Resin Modified Glass Ionomer.

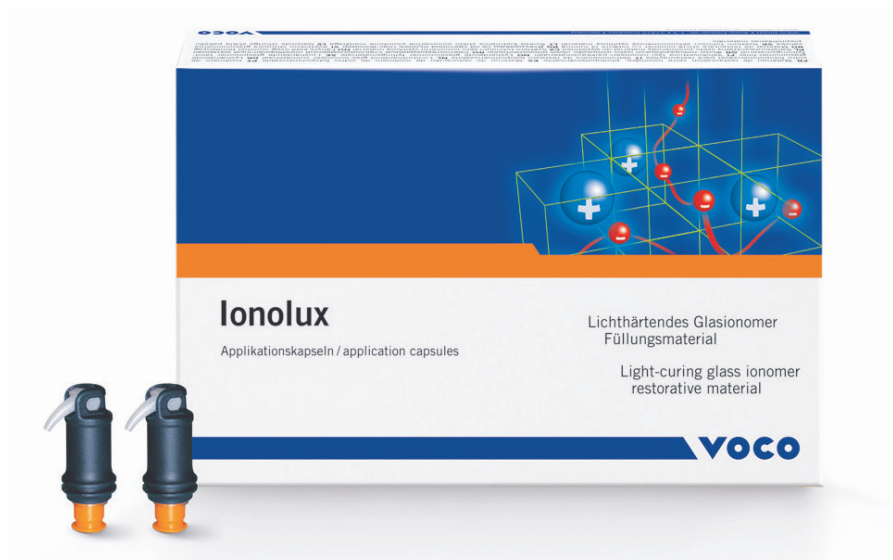
Glass ionomer materials (GIC – glass ionomer cements) were developed in the 1970s, initially being derived from the FAS glass used in silicate materials, but with the phosphoric acid used in silicate being substituted by a polyacrylic acid. These materials had a number of benefits initially, such as fluoride release, but suffered from poor aesthetics and low flexural strength. The addition of a resin to the GIC to form a resin modified glass ionomer (RMGI) provided benefits such as command set (light cure), the release of more fluoride and improved aesthetics compared with conventional GIC materials, plus improvements in flexural strength.

A newly developed RMGI material has recently been developed and released by Voco, namely, Ionolux. It is therefore the aim of this article to describe how a group of practice-based researchers, the PREP Panel, considered the handling of Voco Ionolux.

## Methods

All 33 members of the practice-based research group, the PREP Panel, were sent an email communication asking if they would be willing to evaluate an RMGI material. Of those who responded in the affirmative, 10 members (two of whom were female), with an average time since graduation of 30 years (range 21 to 46 years), were selected at random.

Explanatory letters, questionnaires and a pack containing 100 capsules (20 of each shade) were distributed in mid-October, 2016. The practitioners



were asked to use the materials for 10 weeks and return the questionnaire.

## Clinical evaluation

Regarding the number of glass ionomer (GI) restorations placed by the evaluators in a typical week, six placed less than 10 and four placed 11 to 15 GI restorations. Of these, 39 per cent were stated to be conventional GI, and 59 per cent were RMGI, with two per cent being other types. A wide range of glass ionomer materials was used prior to this study by the respondents, most commonly Riva LC (6) and Fuji IX (7). Five of the respondents used more than one material.

All the evaluators stated that they used resin modified glass ionomer materials (RMGI). The principal reasons for the choice of these materials were good handling, good results, familiarity, good setting time, satisfactory aesthetics, light curing, good wear,

polishability and good compatibility with composite if used at the base of a box. Other comments included that RMGI materials had been, "used after PREP Panel evaluation," were, "easy to prep as a core", "supplied in the practice" and "cheap and cheerful".

When the evaluators were asked to rate the ease of use of their current GI material, the result was as follows:



All the evaluators used these materials in a capsule format.

When the evaluators were asked to rate the ease of use of their current RMGI material, the result was as follows:



Six of the evaluators (60 per cent) used GI materials in load bearing positions in the posterior teeth of adults. All the evaluators who treated children used GI materials in load bearing positions in the posterior primary teeth.

Regarding number of shades, 60➔

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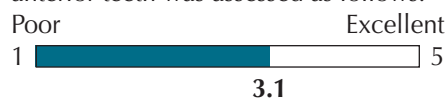
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6 per cent (n= 6) of the evaluators stated that their current GI material had sufficient, with the average number of shades being stated to be three (range: one to five).

The overall aesthetic quality of GI restorations placed by the evaluators in anterior teeth was assessed as follows:



Comments included:

- “Matt finish, dull and opaque.” (two similar quotes)
- “Shades and general appearance.”
- “Do not use GI materials in the aesthetic zone.”
- “Poor finish and optical properties compared with composites.”

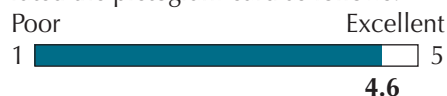
### Evaluation of Voco Ionolux RMGI

Evaluators rated the instructions as follows:



An evaluator commented, “Reiterate incremental build up of 2mm.”

The pictogram card was stated to be helpful by all the evaluators and they rated the pictogram card as follows:



Comments included:

- “A bit flimsy.”
- “Nurse found the instructions simple.”

The packaging was stated to be satisfactory by all the evaluators.

The light curing option of the material was stated to be useful, as follows:

- Yes, always: nine evaluators
- Yes, treatment of children: three evaluators
- Yes, geriatrics: two evaluators

The total number of restorations placed during the evaluation was 402, comprised in percentage terms as follows:

- class V (anterior) – nine per cent
- class III – seven per cent
- class V (posterior) – 25 per cent
- class I or II – 23 per cent
- other – 13 per cent

- deciduous teeth – 23 per cent.

When the evaluators were asked to give details of the placement techniques used for class V restorations, a freehand technique was used by eight evaluators (78 per cent) and a matrix used by four evaluators (33 per cent), with two evaluators using both methods.

When the evaluators were asked to give their, and their dental nurses’, assessment of the dispensing and placement of Ionolux, the result was as follows:



Five (50 per cent) of the evaluators stated that they experienced no difficulty with the material sticking to instruments. Those that did stated they overcame that by moistening the instrument or using an alcohol wipe; one evaluator used a “dab” of Vaseline.

Regarding ease of placement, 90 per cent (n=9) of the evaluators stated that they experienced no difficulty with the material slumping when placing restorations and 50 per cent (n=5) stated the viscosity of the material was satisfactory. Seven of the evaluators (70 per cent) stated that the material had sufficient working time.

Comments made by the remaining evaluators included:

- “Quite light sensitive under ambient light and started to set before adequate carving.”
- “Seemed to vary a bit.”
- “With my headlight on set far too fast, without headlight still too fast – very difficult.”

Regarding restoration margins, 90 per cent of the evaluators (n=9) stated that the restoration margins were satisfactory.

The ease of polishing of restorations of Ionolux RMGI was stated to be as follows:



The translucency/ of Ionolux RMGI for anterior use was rated as follows:



Sixty per cent (n=6) of the evaluators stated the number of shades was adequate. One evaluator suggested deleting shades A1 and A3.5. Suggestions for additional shades were: A4 (two), C4 (two), C5, A5 and a dark cervical shade.

The overall surface finish achieved with Ionolux RMGI restorations was assessed as follows:



The overall aesthetic quality of anterior restorations of Ionolux was assessed as follows:



Comments regarding aesthetic quality included:

- “Sometimes a matt finish.”
- “Acceptable.”
- “Did not use in anterior teeth.”

The principal use of Voco Ionolux RMGI was stated to be as follows:

- Posterior: six evaluators
- Universal: three evaluators

That capsules contained 20 per cent more material compared with competitors was stated to be:

- “Helpful from time to time” (four evaluators).
- “Often helpful” (three evaluators).

That Ionolux is used without an extra tooth conditioner was stated to be an advantage by seven evaluators.

Overall, 80 per cent (n=8) of the evaluators stated they were satisfied with Voco Ionolux RMGI and 70 per cent (n=7) would purchase the material, with 80 per cent (n=8) stating that they would recommend the material to colleagues.

An evaluator commented, “Maybe would if working in the NHS.”

The ease of use of Ionolux RMGI was rated as follows:



Comments included:

- “Best aesthetics of any GI or RMGI I have used.”
- “Good wear properties.”
- “Easy to finish and polish.” ☺

● “Large nozzle makes fillings in posterior teeth a bit tricky” (two similar quotes).

● “Good number of shades and nice finish.”

● “Prefer narrower tip to ensure material is in floor of deep boxes”

Essential changes to make the material more acceptable were considered to be:

● “Capsule tip too short and wide” (five similar comments).

● “Make material less light sensitive.”

The following improvements were suggested for Voco Ionolux:

● “Large capsules not always an advantage. Maybe have two sizes with two prices and let GDP choose.”

● “Reduce light sensitivity” (two evaluators).

● “Slightly thicker consistency for placing and packing but one of the best RMGIs I have tried.”

### Discussion

The Voco Ionolux RMGI restorative system has been subjected to an extensive evaluation in clinical practice, by members of the PREP Panel, in which 402 restorations were placed. Based on this the following conclusions may be made:

● The instructions scored very well (4.6 on a VAS where 5 = excellent and 1 = poor) with no negative comments.

However, fifty per cent of the evaluators reported that the material stuck to instruments and a variety of methods were used to overcome this.

● The score for ease of use was similar to the previously used glass ionomer system. The capsule design, in particular the width of the nozzle, was commented upon by nearly half the evaluators, and this would seem to be the reason for the slight difference in scores for anterior and posterior use.

● Regarding the aesthetics of the material, the score for aesthetic quality of Voco Ionolux was a significant improvement on the previously used glass ionomer material (4.4 compared with 3.1 on a VAS where 1 = poor and 5 = excellent). The material also scored well for surface finish and ease of polishing.

● The majority (70 per cent) of the evaluators stated the working time was satisfactory, although comment was made by the remaining evaluators of fast setting under ambient surgery light and when working with a headlight.

The potential for this new material is illustrated by the fact that the majority of evaluators (70 per cent) would

purchase the material and 80 per cent would recommend it to colleagues.

### Conclusions

The good reception for this new light cured glass ionomer material is indicated by the high number of evaluators stating they would both buy and recommend the system to colleagues. Particularly positive statements were made regarding the aesthetics of restorations placed with Ionolux.

It is possible the scores achieved could be even higher if attention is given to the comments made with reference to the capsule design.

### Manufacturer's comments

Voco acknowledges the PREP Panel for its comments regarding the recently introduced Ionolux RMGI. Feedback received from this evaluation is highly appreciated as it helps Voco R&D to drive ongoing improvements to the product range. We are very pleased with the responses regarding the polish and aesthetic quality of the material, as it was a main goal in the material development to combine the ease of handling of a GI with the aesthetics of a composite.