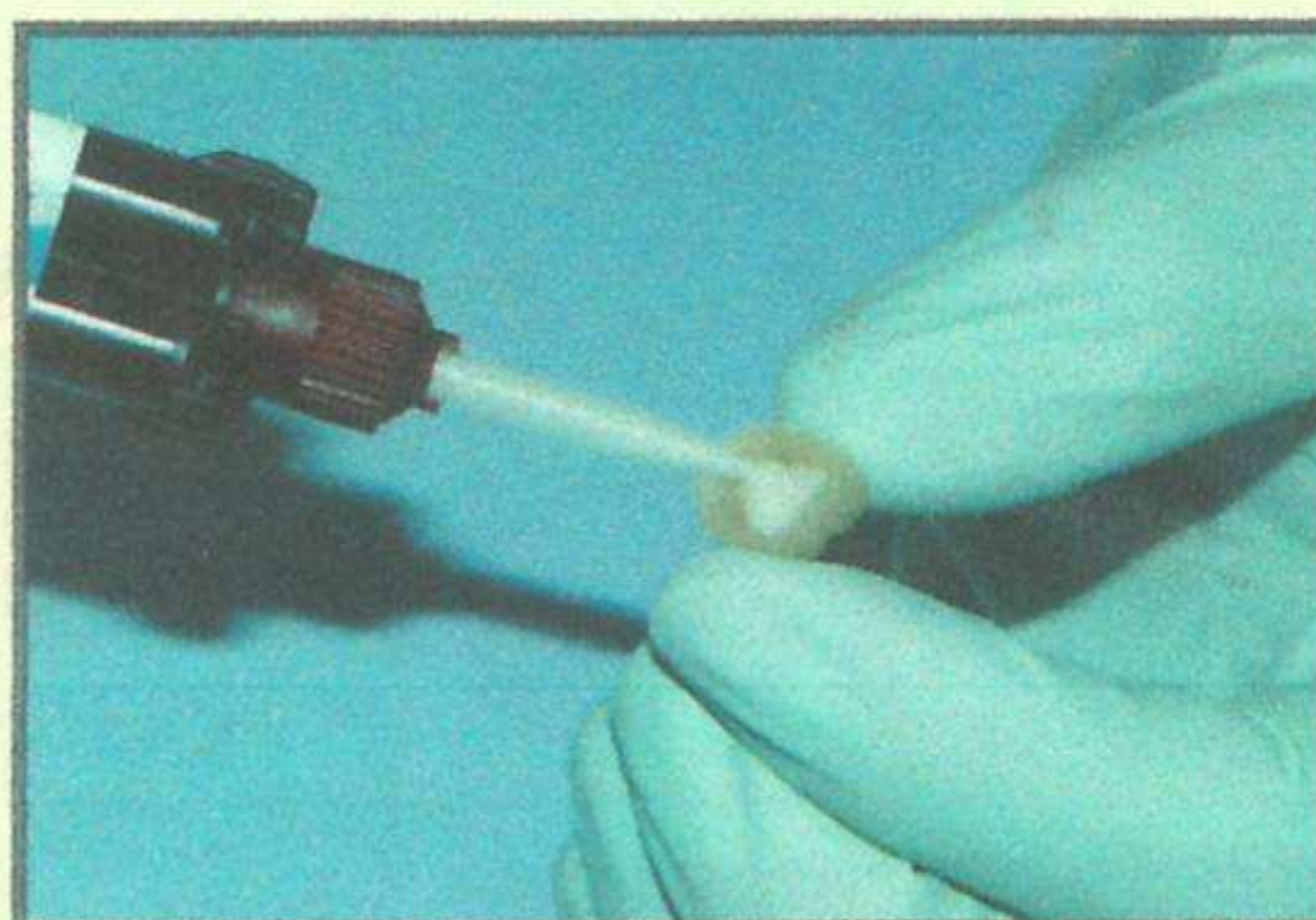


Self-Adhesive Resin Cements—A Replacement or an Alternative?

Gordon and Paul's Clinical Bottom Line: Is there a need for another category of cements? The vast majority of North American dentists are satisfied with resin-modified glass ionomer cements which bond well to tooth structure, release fluoride, and do not produce tooth sensitivity, but have only moderate strength. Occasionally, more strength is desirable such as for short or extremely tapered tooth preparations. Some categories of resin cements can provide that strength, and when the self-etch component is incorporated in the cement, the chances for post-operative tooth sensitivity or contamination of the preparation during cementation are nearly eliminated. Which category of resin cement provides this strength?

Cements for luting restorations continue to be reinvented as new and old features are incorporated, mixed, or adjusted to find the right combination. It seems as if the search continues with the introduction and touting of new and better self-adhesive resin cements. Resin cements were initially technique sensitive, had many steps, had several components, required special storage, and total-etch cements had a high rate of post-op sensitivity. New self-adhesive resin cements contain a self-etching primer *within* the cement, require *no* pre-treatment of teeth or etching, and are potentially least sensitive. This simplified technique is highly attractive to clinicians.

There are presently three types of resin cements related to bonding agents: 1) Total-Etch, used primarily for veneers on enamel surfaces and for inlays and onlays used with total-etch bonding systems (*Calibra, Duo-Link, NX3, RelyX Veneer, Variolink II, etc.*); 2) Self-Etch Primer, as a separate step, used when strength is required and self-etch is desired (*Multilink Automix, Panavia F 2.0, etc.*); and 3) Self-Adhesive, with self-etching primer incorporated within cement, used for simplicity when



Automix tip dispensing cement into an all-ceramic crown, demonstrating simplicity

self-etch is desired and high strength is not required (*G-Cem, Maxcem Elite, RelyX Unicem, etc.*).

Cements in order of generally decreasing bond strength: total-etch, self-etch primer, self-adhesive, resin-modified glass ionomer, and glass ionomer.

Indications for use of self-adhesive cements: posts, crowns, bridges, inlays, and onlays (*i.e. PFM, zirconia-based, all-ceramic, indirect resin restorations*) where preparations have good retentive features and there is potential for post-operative tooth sensitivity.

This report discusses the advantages and limitations of self-adhesive resin cements, clinical evaluation, laboratory evaluation, and clinical tips.

Advantages

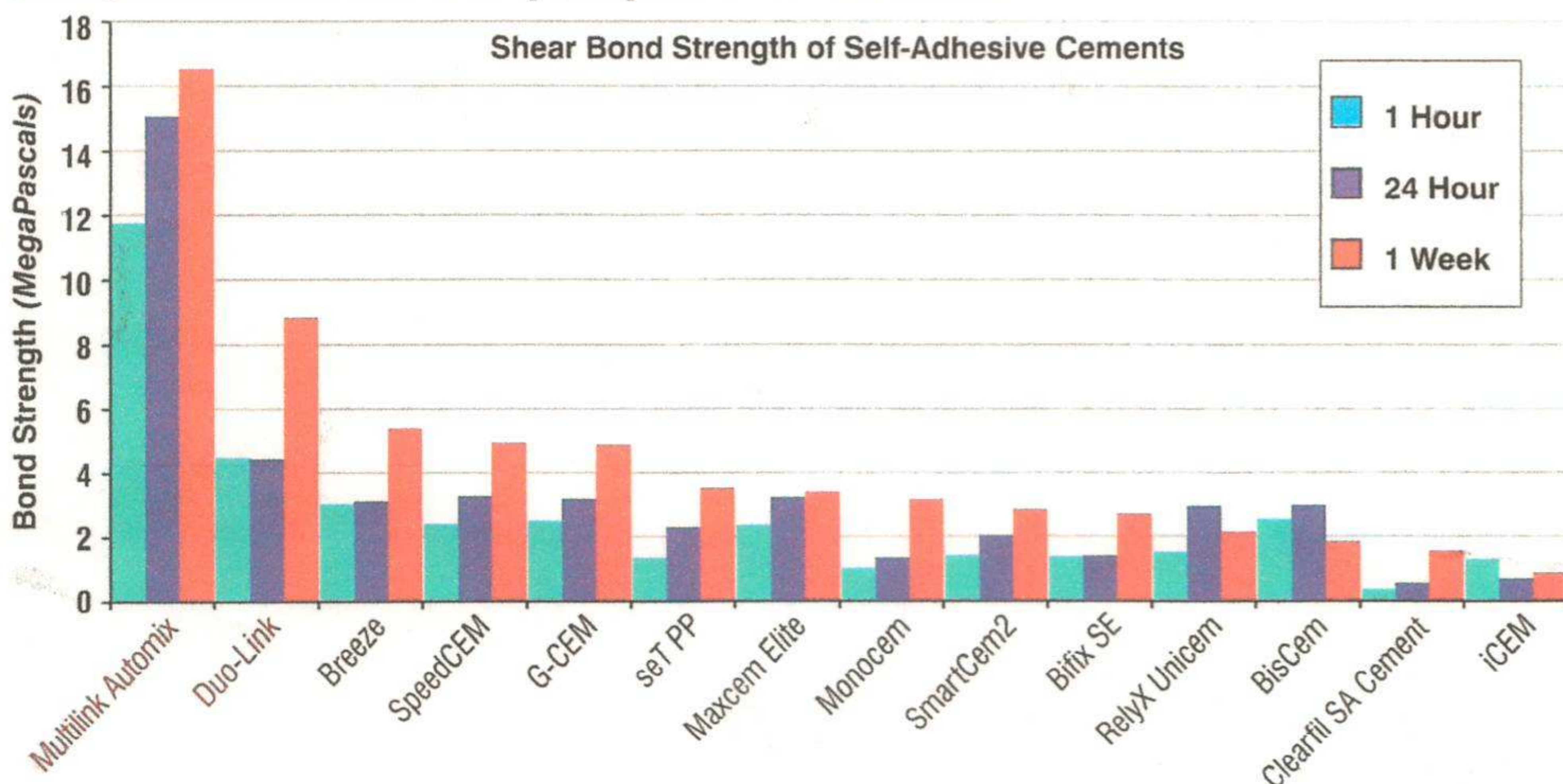
- Minimal post-operative tooth sensitivity
- No etching or pretreatment of teeth
- Simple, one-step procedure
- Easy mixing if used with automix tips
- Low technique sensitivity
- Dual-cure or self-cure
- Easy cleanup
- Low solubility

Limitations

- Little to no sustainable fluoride release: less than resin-modified glass ionomers
- Low bond strength
- Not indicated for veneers or adhesive bridges
- High cost
- Limited shade selection
- Refrigeration required or recommended
- Early versions of this cement reported failures in bonding during service of inlays and onlays
- More clinical research is needed

Clinical and Laboratory Evaluation

Method: Shear bond test samples were formed using 4.2mm diameter gel capsules on freshly extracted teeth. Excess cement was brushed away, then sample was light cured and allowed to set per manufacturer's instructions. Samples were then stored in 37° C water for 1 hour, 24 hours, and 1 week prior to shear testing. Note: Bond strength values produced by this test were markedly lower than values reported using other methods (*i.e. Ultradent method*) and are a direct result of the specific parameters used in this test.



CR Evaluator Survey Results:

- **Cement used most for daily routine cementation of crowns and fixed partial dentures:** 62% resin-modified glass ionomer, 18% self-adhesive resin, 8% self-etch primer resin, 5% conventional glass ionomer, and 7% other
- **Current use:** 74% of evaluators currently use a self-adhesive resin cement
- **Most popular brands:** 65% RelyX Unicem by 3M ESPE and 27% Maxcem Elite by Kerr (*multiple cements reported*)
- **Reasons for use:** 73% simplicity, 62% retention, and 59% no post-op sensitivity
- **Procedures where used:** 50% posts, 48% zirconia-based crowns, and 46% onlays
- **Failures:** 43% of evaluators reported failures using self-adhesive resin cement; most common failure: 10% reported loose restorations
- **Overall rating:** of those who use self-adhesive resin cements, 12% rated self-adhesive resin cements as better than resin-modified glass ionomer, 59% rated self-adhesive cements as the same, and 29% rated them as worse than resin-modified glass ionomer
- **Cost:** All are considered too high