

THE DENTAL ADVISORTM

Improving Patient Care Through Research & Education



Resin Cements - Bonding: The End of Luting

Today, resin-based cements that bond an all-ceramic restoration to the tooth are replacing traditional water-based crown and bridge cements used to lute metallic restorations. Bonding a ceramic restoration can result in improved retention, improved esthetics, reduced post-operative sensitivity, reduced marginal discoloration, and reduced secondary caries.

This issue of THE DENTAL ADVISOR reviews the properties and provides clinical tips for the use of resin cements. Long-term clinical results for resin cements are described.

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RATINGS:

Excellent + + + + +
Very Good + + + +
Good + + +

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From the Desk of Dr. Bunek, Editor-in-Chief



I had the wonderful opportunity to attend the AACD meeting in Seattle last week. A memorable conversation I had was about the use and confusion in using resin cements. A colleague of mine wished we were practicing 100 years ago because the only cement on the market was zinc phosphate, and the only decision that needed to be made was which operatory to use! While we all laughed it off, there was a lot of truth to what he was saying. In the last decade, the demands of esthetic, metal-free restorations have resulted in a plethora of cements from which clinicians have to choose. Deciding which cement to use can be overwhelming. If the differences among cements are

not understood, they can be a deterrent to using anything new. As a practicing clinician, I too was confused at one point. However, after understanding a few key properties and strengths/weaknesses about each cement, selecting the proper cement has become easy and predictable.

To help sort out the confusion, in this month's issue, we are lucky to have the founders of THE DENTAL ADVISOR, Drs. John Powers and John Farah, co-author an article with me that will review the properties of resin cements, provide clinical tips for their use, as well as help sort out the confusion with the use of surface treatments for silica- and zirconia-based restorations. As always, I welcome your comments and suggestions; you can reach me at drbunek@dentaladvisor.com. Thanks for your continued support and reading!

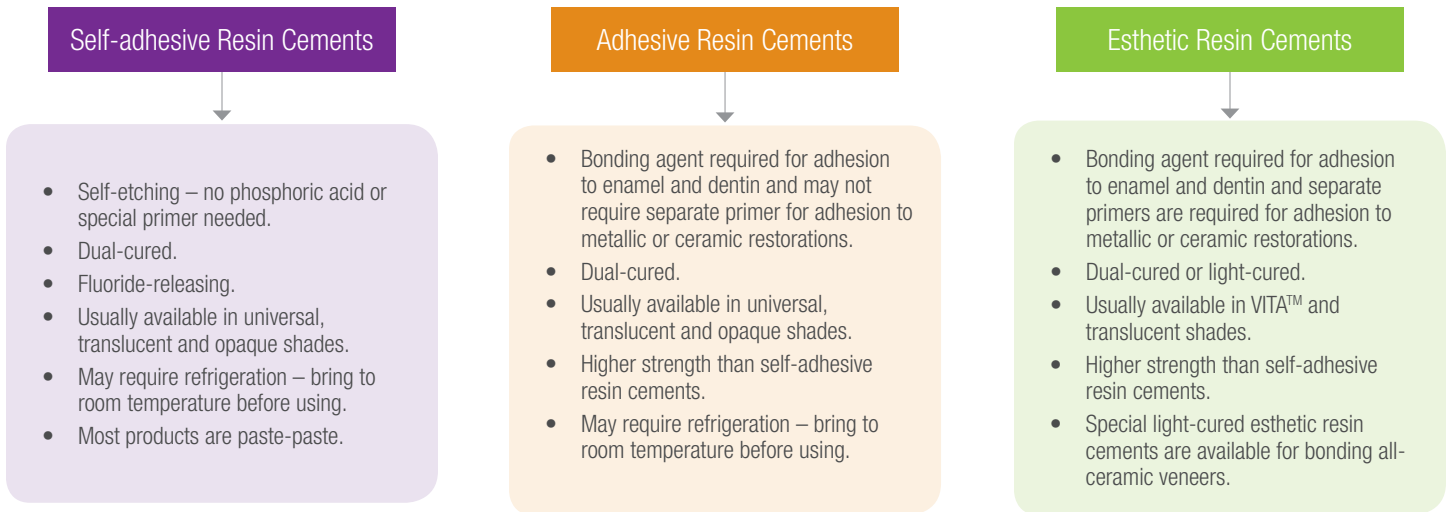
Resin Cements

Dentistry is rapidly evolving from the cementation of metal and metal-ceramic restorations using traditional cements to the bonding of all-ceramic esthetic restorations using resin-based adhesive cements. Resin cements are composed of diacrylate resins and glass filler that contain light activators, chemical initiators, or both. They form a micromechanical bond to tooth structure as well as to the restoration and are insoluble in oral fluids.

Resin cements can be classified into 3 categories:



Characteristics of Resin Cements



Decision Making: Which Resin Cement Should I Use?

Numerous factors influence the dentist’s decision regarding cement selection. Ease of use, cost, strength, and postoperative sensitivity are just a few. To add to the confusion, there are a large variety of cements to choose from. One type of category of cement is not ideal for every situation; therefore, it is imperative to understand the difference in the physical and mechanical properties, as well as handling characteristics. Table 1 highlights the advantages, disadvantages, indications, and contraindications for each category of resin cements.

	Advantages	Disadvantages	Indications	Contraindications
Self-Adhesive Resin Cement	- Easy to use (no etch or primer required) - Less technique sensitivity - Low postoperative sensitivity - Easy cleanup	- Can have a shade shift over time - Not as strong as adhesive or esthetic resin cements	- All-metal or ceramic-metal crowns/ bridges w/good retentive preparations - High-strength ceramic (zirconia) crowns and bridges - Posts (metal and fiber)	- All-ceramic veneers - Crown or bridge with poor retention - Resin-bonded bridges
Adhesive Resin Cement	- No etching of tooth	- Can have a shade shift overtime - Clean-up can be difficult - May require oxygen inhibition gel	- All-ceramic crowns, onlays, inlays, bridges - High-strength ceramic (zirconia) or metal-based crowns/ bridges - Maryland bridges - Posts (metal or fiber)	- All-ceramic veneers
Esthetic Resin Cement	- Highly esthetic - Minimal shade shift over time - Multiple shades and try-in pastes available - Highest bond strength	- Most technique sensitive - Moisture sensitive - Highest chance of postoperative sensitivity if used with total-etch bonding	- All-ceramic crowns and veneers in esthetic zone - All-ceramic inlays/onlays	- Opaque all-ceramic restorations

Table 1: Resin Cements: Advantages, Disadvantages, Indications, and Contraindications

Long-term Clinical Data of Self-adhesive Resin Cements

Long-term performance studies conducted by THE DENTAL ADVISOR for self-adhesive resin cements have shown excellent results. Four clinical studies are highlighted in the table below.

Product	Number of Years	Number of Restorations Observed at Recall	Lack of Post-operative Sensitivity	Resistance to Marginal Staining	Retention
RelyX Unicem Self-Adhesive Resin Cement (3M ESPE)	10	1311	98.9%	92%	96.3%
PANAVIA SA CEMENT (Kuraray Noritake Dental)	2	257	97%	100%	100%
G-CEM Automix (GC America)	2	52	90%	100%	100%
seT (SDI (North America), Inc.)	1.5	198	96%	96%	96%

Table 2: Long-term Clinical Data of Self-adhesive Resin Cements

For more information:

RelyX Unicem Self-Adhesive Resin Cement (3M ESPE):

<http://www.dentaladvisor.com/clinical-evaluations/evaluations/3m-espe-relyx-unicem-self-adhesive-resin-cement-10-year.shtml>

PANAVIA SA CEMENT (Kuraray Noritake Dental): <http://www.dentaladvisor.com/clinical-evaluations/evaluations/panavia-sa-cement-2-yr.shtml>

G-CEM Automix (GC America): <http://www.dentaladvisor.com/clinical-evaluations/evaluations/g-cem-automix-2-yr.shtml>

seT (SDI (North America), Inc.): <http://www.dentaladvisor.com/clinical-evaluations/evaluations/set-18-mo.shtml>

Q&A

Q: Dr. Farah, what type of cement do you recommend for use with veneers?

A: Esthetic resin cements generally contain an option for dual-cure or light-cure only polymerization. However, a few esthetic resin cement kits include light-cure only cements marketed toward veneers due to their color stability and increased working time. Light-cured resin cements do not contain an amine catalyst (found in many dual-cure resin cements), so there is less chance of shade change over time that can result from oxidation of the amine catalyst. These veneer kits also provide try-in pastes and a variety of shades. **Mojo Veneer Cement** (Pentron Clinical), **Variolink Veneer** (Ivoclar Vivadent), and **3M ESPE Rely X Veneer Cement** (3M ESPE).

Q: Dr. Powers, is it necessary to apply ceramic primer to a full-contour zirconia crown before cementing with self-adhesive resin cement?

A: If the crown has good retention, then the use of a ceramic primer is not necessary. If the crown has poor retention, then use of a ceramic primer (**CLEARFIL CERAMIC PRIMER**, Kuraray Noritake Dental; **Monobond Plus**, Ivoclar Vivadent; **Z-PRIME PLUS**, Bisco) is recommended. Typically, use of ceramic primer can double the bond strength of the resin cement to the zirconia substrate.

Q: Dr. Powers, can I assume that resin cements labeled as dual-cured will self-cure?

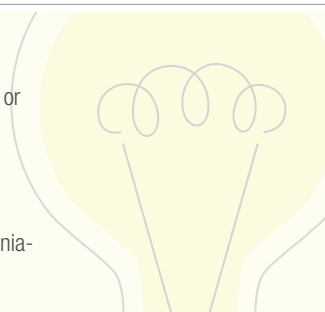
A: Some dual-cured resin cements will self-cure without light activation, whereas others require light activation to initiate the self-curing mechanism. Laboratory tests show that most dual-cured resin cements have higher strength if they are light activated.

Q: Dr. Bunek, I want to cement a full-contour zirconia crown that has poor retention. What type of resin cement do you recommend?

A: The use of an adhesive resin cement (**RelyX Ultimate Adhesive Resin Cement**, 3M ESPE or **Multilink Automix**, Ivoclar Vivadent) is recommended with non-retentive preparations. These cements require separate priming of tooth substrate and of the zirconia restoration. It is also important to clean the inside of your zirconia restoration after try-in. However, the use of phosphoric acid is not recommended with zirconia-based restorations. One method of cleaning the intaglio surface that has been tested and proven in THE DENTAL ADVISOR Biomaterials Research Center is with the use of **Ivoclean** (Ivoclar Vivadent). After cleaning the contaminated zirconia surface with **Ivoclean**, a ceramic primer can effectively be applied to the surface.

Clinical Hints: Resin Cements

- Use light activation whenever possible - dual-cured cements typically have increased flexural strength and bond strength when activated with a light vs. self-curing.
- Translucent shades may be sensitive to ambient light.
- Excess cement is easy to remove after 3-5 seconds of exposure to curing light.
- Use stronger cements when there is not enough retention.
- Do not apply resin cements directly on exposed pulp or dentin that is close to the pulp. Use **TheraCal** (Bisco Dental Products).
- Use a silane primer with silica-based all-ceramic restorations.
- Do not use hydrofluoric or phosphoric acid with zirconia-based restorations.



Resin Cements Evaluated by THE DENTAL ADVISOR

Self-Adhesive			Adhesive Resin		Esthetic Resin	
Company	Product	Rating	Product	Rating	Product	Rating
3M ESPE	 3M ESPE RelyX Unicem 2 Automix Self-Adhesive Resin Cement	96%	 3M ESPE RelyX Ultimate Adhesive Resin Cement	96%	3M ESPE RelyX Veneer Cement	98%
Kuraray Noritake Dental	 PANAIA SA CEMENT	96%	Panavia F 2.0	97%	CLEARFIL ESTHETIC Cement	96%
Ivoclar Vivadent	SpeedCEM	93%	 Multilink Automix	97%	 Variolink II	97%
Kerr Corporation	Maxcem Elite	NT	NX3 XTR	NT	 NX3 Nexus Third Generation	97%
SHOFU DENTAL CORP	BeautiCem SA	CE	ResiCem	91%		
GC America	 G-CEM Automix	98%				
SDI (North America), Inc.	seT PP	97%				
VOCO	Bifix SE	94%				



TDA Recommends

Self-Adhesive Cements:

- **3M ESPE RelyX Unicem 2 Automix Self-Adhesive Resin Cement** (3M ESPE)
- **PANAIA SA CEMENT** (Kuraray Noritake Dental)
- **G-CEM Automix** (GC America)

Adhesive Cements:

- **Multilink Automix** (Ivoclar Vivadent)
- **3M ESPE RelyX Ultimate Adhesive Resin Cement** (3M ESPE)

Esthetic Resin Cements:

- **NX3 Nexus Third Generation** (Kerr Corporation)
- **Variolink II** (Ivoclar Vivadent)

Surface Treatment for Silica- and Zirconia-based Restorations

Clinicians are often confused regarding the best way to treat the intaglio surface of silica- and zirconia-based restorations before cementation. Surface treatments of indirect restorations are a crucial step in adhesion as they improve the bond strength at the ceramic-cement interface by micromechanical and chemical bonding. **Micromechanical interlocking** is achieved by increasing the surface area of indirect restorations. This can be done by etching with hydrofluoric (HF) acid or sandblasting with 50 um alumina. **Chemical bonding** is achieved through the use of silane or ceramic primers with MDP. Table 3 highlights general guidelines for surface treatments.

	Micromechanical Treatment: HF or Sandblasting	Chemical Treatment: Silane or Ceramic Primer w/ MDP
Silica-based glass ceramic (laboratory)	HF (laboratory will generally etch)	Silane
Silica-based glass ceramic (milled chairside)	HF	Silane
Zirconia-based restoration cemented with self-adhesive cements	Sandblast with 50 um alumina	Self-adhesive and adhesive resin cements usually contain an acidic monomer (MDP) - therefore no need to use a ceramic primer if preparation is retentive
Zirconia-based restoration cemented with adhesive resin cements and esthetic resin cements	Sandblast with 50 um alumina	Ceramic Primer w/MDP

Table 3: Surface Treatment Guidelines: Silica- and Zirconia- based Restorations.

TheraCal LC

Bisco Dental Products

(800) 247-3368, (847) 534-6000 | www.bisco.com

Purpose

The purpose of this clinical study was to determine the clinical performance of **TheraCal LC** (Bisco Dental Products).

Placement

Ninety-seven restorations placed in 55 patients were evaluated at placement for:

- Type of tooth
- Level of caries risk
- Type of pulp cap
- Bonding agent and restorative material used
- Patient sensitivity before placement

The types of teeth and types of restorations are indicated in Figures 1 and 2. Eight restorations were noted as being very deep but there is no record of any requiring root canal treatments at a later date. There were no direct pulp caps. All placements were indirect pulp caps, liners under deep restorations or in teeth with a history of significant sensitivity. Levels of caries risk are indicated in Figure 3. The teeth were restored using 11 resin composites, two ceramics and eight self-etching bonding agents.

Results at Six Months

Recalled restorations were evaluated in the following categories:

- Postoperative sensitivity as reported by the patient
- Necessity of endodontic treatment
- Percentage of direct and indirect pulp caps that required endodontic treatment
- Percentage of teeth classified by caries risk that required endodontic treatment

Of the 14 restorations eligible for six-month recall, nine were available for evaluation. No postoperative sensitivity was reported by patients. None of the teeth required endodontic treatment.

Summary

TheraCal LC had excellent performance at six months. No postoperative sensitivity was observed six months after placement. None of the teeth required endodontic treatment. **TheraCal LC** received a 100% clinical performance rating at the six-month recall.

6-month Clinical Performance

+++++

Consultants' Comments

"Finally, there is a therapeutic liner that reduces sensitivity and is easy to place."

*"None of the teeth treated with **TheraCal LC** needed root canal treatments."*

*"In patients who had a history of postoperative sensitivity, **TheraCal LC** was exceptional in reducing or eliminating the discomfort."*

FIGURE 1

Types of teeth included at placement.

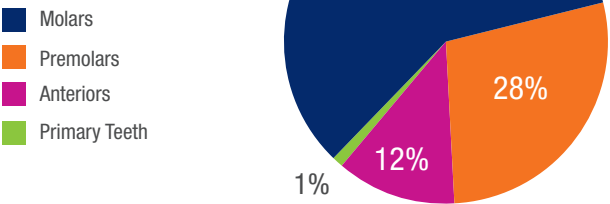


FIGURE 2

Types of restorations placed.

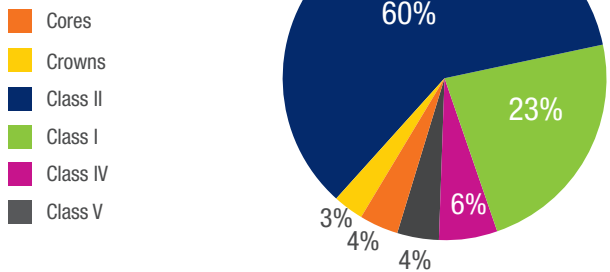
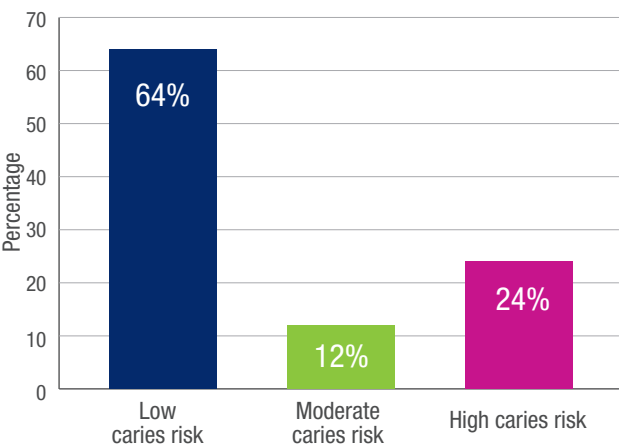


FIGURE 3

Levels of caries risk at placement.



3M ESPE Retraction Capsule

3M ESPE

(800) 634-2249 | www.3mespe.com

Description

3M ESPE Retraction Capsule is an astringent retraction paste supplied in a single-use capsule. The capsule is compatible with common composite dispensers. The extra-fine, soft-edge tip has an orientation ring that corresponds in size and position to a periodontal probe. The retraction paste contains 15% aluminum chloride and can be used alone or in conjunction with retraction cord for all indications requiring temporary deflection of marginal gingival. Its use requires a clean and dry sulcus area (e.g., when taking impressions, cementing temporary and permanent restorations, and when preparing Class II and Class V restorations). **3M ESPE Retraction Capsule** contains 0.3 g of paste per capsule. Each capsule is individually sealed in a foil blister pouch, and should remain in the blister until ready for immediate use. The product is sold in a refill pack of 25 capsules or a value pack of 100 capsules. The **3M ESPE Retraction Capsule** was evaluated by 30 consultants in 612 uses. This retraction paste received a 91% clinical rating.

Suggested Retail Cost

Box of 25	\$80.80
Box of 100	\$281.30

Product Features

3M ESPE Retraction Capsule has excellent hemostatic properties and produces a clean, dry sulcus. The best results for retraction are achieved when the paste fills the entire sulcus. **3M ESPE Retraction Capsule** contains enough paste for use on up three teeth. The narrow tip is a highly rated feature of **3M ESPE Retraction Capsule**. While the primary use is for tissue retraction before crown and bridge impressions, it is also useful for moisture control when seating ceramic restorations. The blue color is easy to see in the mouth and aids in ensuring complete removal from the sulcus. Care must be taken to rinse off the paste completely. If a chalky residue remains on the tooth and gingiva after initial rinsing, the use of vigorous air-water spray is recommended to remove it. The capsule should remain in the foil blister pack until ready for use, as it is designed to keep the material moist. Consultants very occasionally encountered capsules that were dry, and the paste could not be extruded. Forty-three percent of consultants rated **3M ESPE Retraction Capsule** better than other gingival products they had used and 27% rated it as equivalent. Sixty percent would switch to **3M ESPE Retraction Capsule** and 80% would recommend it to a colleague.

++++ 1/2



Consultants' Comments

"The best paste system I have ever used."

"An excellent hemostatic agent."

"Love the narrow diameter of the tip."

"Great for use with Class V restorations."

"Hard to rinse off."

Clinical Tips

- This material should not be used in patients with periodontal disease, open furcations or exposed bone.
- Store capsules in their foil pouches until the time of use.
- Orient the tip perpendicular in the sulcus and express the paste slowly.
- Use of a cotton compression cap can be helpful to aid in retraction.
- If residue remains on the tooth/gingiva after rinsing, scrub with a micro-tipped applicator brush to remove it.
- Completely remove paste from sulcus prior to taking a final impression. Residual paste can inhibit setting of the impression material. ■

3M ESPE RelyX Ultimate Adhesive Resin Cement

3M ESPE
(800) 634-2249 | www.3mespe.com

Description

RelyX Ultimate Adhesive Resin Cement is an adhesive resin cement available in a dual-barrel syringe with a mixing tip for easy mixing and dispensing. Used in conjunction with **Scotchbond Universal Adhesive** (3M ESPE), a new all-purpose bonding agent, it results in high bond strength to both enamel and dentin - measured to be over 30 MPa by THE DENTAL ADVISOR. **RelyX Ultimate Adhesive Resin Cement** includes a component that activates the self-cured function of the bonding agent and eliminates the need for an additional activator. **Scotchbond Universal Adhesive** also functions as a primer for silica-based ceramics, zirconia and metal substrates. In addition, it can also be used with total-etch and self-etch bonding techniques. The combination can be used for cementing silica-based ceramic, zirconia, PFM, and CAD/CAM restorations. **RelyX Ultimate Adhesive Resin Cement** is available in shades: A1/Light, A3 Opaque, B0.5/White, and Translucent.

Evaluation Protocol

During a 15-month period, over 700 restorations were cemented with **RelyX Ultimate Adhesive Resin Cement** and **Scotchbond Universal Adhesive** by four dentists. The restorations included mostly crowns; bridges (3, 4 and 5 units); and a few inlays, onlays and veneers. The vast majority were silica-based ceramic and zirconia restorations.

Results at One-year

Two hundred and seventy five restorations (Figure 1) were recalled over a three-month period. The recalled restorations were evaluated for lack of sensitivity, resistance to marginal staining and retention. Each category was rated on a scale of 1 to 5. 1=poor, 2=fair, 3=good, 4= very good, and 5=excellent.

Lack of sensitivity

Lack of sensitivity was rated excellent (Figure 2). Ten patients reported mild to moderate sensitivity lasting for a period of a few days after cementation. Only one patient experienced sensitivity that lingered for about one month and then dissipated after an occlusal adjustment.

Resistance to marginal staining

Resistance to marginal staining was rated excellent (Figure 2). Five of the recalled patients presented with very slight discoloration (a rating of 4) at the margin that did not require intervention. One patient experienced significant discoloration of posterior crown requiring replacement.

Retention

Retention was rated excellent (Figure 2). Three crowns and two veneers debonded during the first 15 months of service. This represents a debond rate of less than 0.2%. The two veneers debonded shortly after cementation, and it is possible that the material was not adequately mixed. Overall, the debonding rate has been low, attesting to the high bond strength of the cement to tooth structure.

1-year Clinical Performance

+++++

Consultants' Comments

"Loved the material – it was easy to work with and a very reliable bond."

"I cemented two minimally retentive bridges with excellent results."

"Quick and easy, I like it."

"After seating a restoration, spot cure for not more than two seconds; otherwise, the set material is hard to remove."

FIGURE 1

Distribution of restorations evaluated at one year.

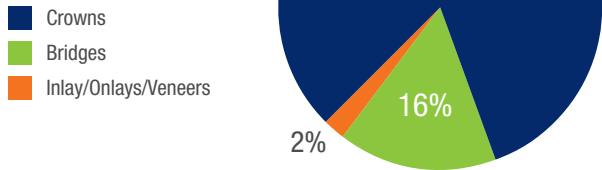
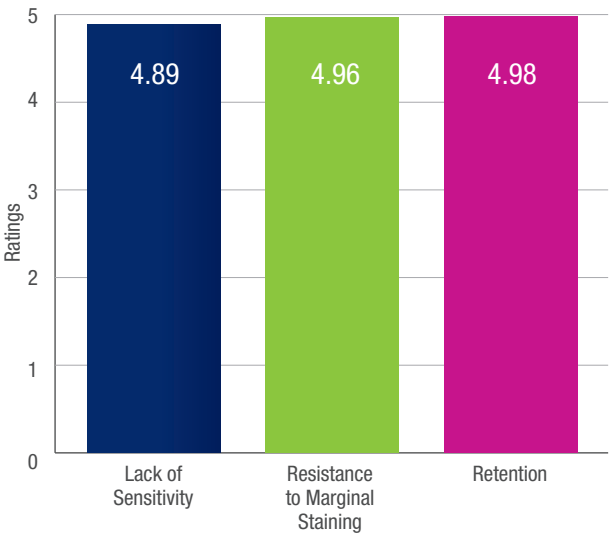


FIGURE 2 Results at One year



Conclusion

RelyX Ultimate Adhesive Resin Cement used with **Scotchbond Universal Adhesive** performed exceptionally well at the one-year recall, based on observations of low sensitivity, minimal marginal discoloration and a very low debonding rate. **RelyX Ultimate Adhesive Resin Cement** received a 99% clinical performance rating.

3M ESPE Filtek Bulk Fill Flowable Restorative

3M ESPE

(800) 634-2249 | www.3mespe.com

Description

3M ESPE Filtek Bulk Fill Flowable Restorative is a flowable restorative material with a 4 mm depth of cure, reducing the need to incrementally layer restorative material. This composite is designed for low shrinkage and low polymerization stress, while the flowable viscosity is designed to provide good adaptation. When used for Class I and Class II restorations, **Filtek Bulk Fill** can be used as a base layer and should be covered with 2 mm of composite strong enough handle the occlusal load. **Filtek Bulk Fill** can also be used for pit and fissure sealants, Class III and V restorations, core build-ups where at least half the coronal tooth structure is remaining, restoration of minimally invasive cavity preparations, blockout of undercuts, and repair of resin and acrylic temporary materials. **Filtek Bulk Fill** is packaged in 2 g syringes and 0.2 g unit-dose capsules and is available in shades U (Universal), A1, A2 and A3. Curing time is at least 20 seconds for shade U and 40 seconds for shades A1, A2 and A3. **Filtek Bulk Fill** was evaluated by 20 consultants who placed 877 restorations. This bulk-fill composite received a 91% clinical rating.

Suggested Retail Cost

2-count syringe kit	\$81.90
15-count capsule kit	\$64.70

Product Features

Filtek Bulk Fill gives the clinician two delivery options - syringes and capsules. Both are well marked and are easy to identify by their orange coloring. The ability to use this composite for indications common to flowable composites and as a bulk-fill base layer make it a versatile product to keep in the office. The shades are translucent, which allows a greater depth of cure. Minimizing the number of layers to complete a restoration was reported to be a real time saver for many consultants.

Filtek Bulk Fill has a viscosity that stacks well and does not slump or run. In some cases an instrument is needed to adapt this flowable material to the cavity walls. Some consultants noted that the material contained bubbles upon extrusion from the syringe or capsule. Thirty-five percent of consultants rated **Filtek Bulk Fill** better than other bulk-fill composites they were using and 30% rated it to be equivalent. Fifty percent would switch to **Filtek Bulk Fill** and 75% would recommend it to a colleague.

++++ 1/2



Consultants' Comments

- "Easy to place, flows well, stacks well."
- "We really love the extended tips on the unit dose capsules."
- "Great color match."
- "Provides nice contrast on radiographs."
- "Does not mask dark or stained dentin."
- "I prefer the bulk-fill composites that do not require a second layer."
- "Long curing times."
- "Composite strings from the tip at the end of placement."
- "Create an extra light shade for pediatric restorations."

Clinical Tips

- Filtek Bulk Fill** can be used with any self-etch or total-etch bonding system.
- Make sure to adjust curing time depending on light source and shade of the material used. ■

Snap-On Smile

DenMat Holdings LLC
(800) 445-0345 | www.denmat.com

Description

Snap-On Smile is a removable appliance made of tooth-colored resin that is worn over the existing teeth. It can be designed as a full-arch or unilateral device and may be used to replace missing teeth. **Snap-On Smile** is indicated for upper and lower teeth as a short- or long-term option, for establishing vertical dimension before starting full-mouth reconstruction, as a diagnostic tool, as a provisional for implant restorations, for cosmetic enhancement of color or alignment, or as a removable partial denture. **Snap-On Smile** is available in 22 shades.

Clinical Evaluation Protocol

Eight consultants had **Snap-On Smile** appliances fabricated for 29 patients. Laboratory fabrication of **Snap-On Smile** was completed by DenMat, and each case required a PVS impression of the treated arch, opposing impression or model and bite registration; photos were optional. Appliances consisted of temporary restorations used during implant treatment, trial options for cosmetic treatment, and replacements for missing teeth. Eighteen patients were available for follow-up at one year. Of these patients, 33% were still wearing their appliances occasionally and 67% had discontinued wearing them.

At recall, appliances were evaluated on a 1-5 rating scale: 1 = poor, 2 = fair, 3 = good, 4 = very good, 5 = excellent.

Clinical Observations

Esthetics

The appearance of **Snap-On Smile** received a wide range of ratings from patients and consultants (Figure 1). Some patients loved it and thought that it greatly enhanced the appearance of their smiles. The monochromatic color and shallow embrasures led to some comments that the teeth did not look natural.

Retention/Fit

Snap-On Smile has a snap fit and maintained good retention after a year's use (Figure 1). Since **Snap-On Smile** fits over unprepared teeth, it often produced a full feeling in the mouth. The bulkiness led to changes in speech and increased salivation. Most of the patients commented that **Snap-On Smile** was difficult to use functionally. Chewing was uncomfortable and inefficient.

Color Stability

The **Snap-On Smile** material maintained a glossy surface and was resistant to stain and discoloration (Figure 1).

Gingival Health

The main effect on the gingiva was related to eating and food becoming lodged underneath the appliance (Figure 1). Gingival health was dependent upon proper oral hygiene. No sores or irritation of the soft tissue were observed by consultants.

Lack of Sensitivity

Some pressure was noted, and patients compared it to the feeling of wearing a retainer (Figure 1).

1-year Clinical Performance

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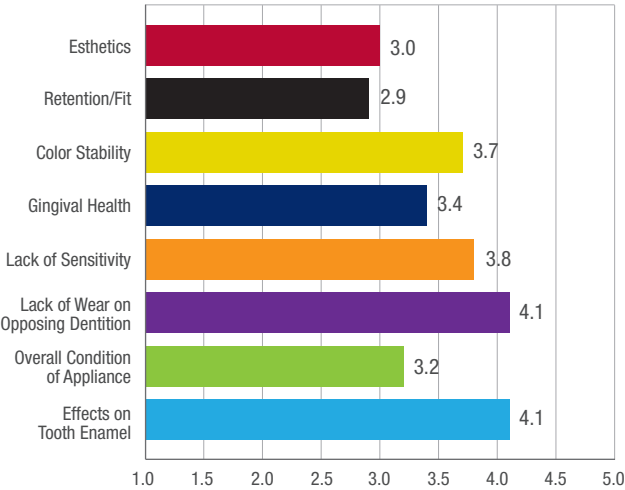
Consultants' Comments

- "Patients tended to wear it at first then gradually decreased using it."
- "Those still wearing **Snap-On Smile** after a year tended to use it for special occasions only."
- "Patients must be diligent about rinsing or brushing after eating."

Patients' Comments

- "My co-workers gave me many compliments on how it looked."
- "It still looks like new."
- "Makes my smile so nice!"
- "Stays in very well."
- "Easy to clean and is still in good condition. I treat it with care."
- "Did not feel or look natural."

FIGURE 1: Snap-On Smile Ratings at One Year



Snap-On Smile One-year Clinical Performance *(cont.)*

Effects on Teeth

No effects on tooth enamel from insertion/removal were observed by dentists or patients (Figure 1). Likewise, no wear on opposing dentition was visible (Figure 1).

Fracture Resistance

Only one instance of fracture was observed. A full-coverage maxillary appliance broke in the molar region at one week.

Overall Condition

Other than the appliance that fractured, **Snap-On Smile** appliances remained in good condition during the one-year evaluation (Figure 1). The fact that most appliances had occasional or short-term use likely contributed to the like-new condition.

Overall Patient Satisfaction

Satisfaction ratings were highly dependent on two factors: esthetics and function. Even though patients were nearly unanimous in stating that **Snap-On Smile** was difficult to use for chewing, those who found their appliances attractive would wear them to enhance their appearance.

Summary

Case selection and management of patients' expectations are critical in achieving patient satisfaction with **Snap-On Smile**.

Snap-On Smile appliances were most useful for short-term use (cosmetic trial, provisional for implant restorations). The appliances that were still in use at one year were in good condition. **Snap-On Smile** received a clinical performance rating of 84%.

AirLight M800-S

Beyes Dental Canada, Inc.

(877) 703-3562 | www.beyes.ca

Description

The **AirLight M800-S** high-speed handpiece incorporates a built-in miniature generator to power the LED light. The drive air rotates the generator, generating electricity to illuminate the LED. The need for fiberoptic tubing and bulbs is eliminated. The unit requires minimum air pressure of 35 psi. **AirLight M800** handpieces are designed with ceramic ball bearings and have a three-port water spray, a push button auto chuck mechanism and can be sterilized to 135°C. The **AirLight M800** attaches to all four-, five-, and six-hole handpiece tubing and attaches to a quick connect swivel coupler. **AirLight M800** comes with a one-year warranty and is available in two head sizes: M800-S standard, 13.1 mm, and M800-M mini, 11.8 mm. **AirLight M800-S** was evaluated by 12 consultants in over 500 uses. This high-speed handpiece received an 87% clinical rating.

Suggested Retail Cost \$598.00 handpiece with coupler

Equipment Features

The ability to have illumination from a handpiece using non-fiberoptic tubing is a great convenience and an economical solution for many dentists. **AirLight M800-S** produces very good illumination, and the three-port water spray effectively clears the working area. Since the generator requires 35 psi drive air to rotate the motor, the light functions at full speed but not if the handpiece is being run slowly. The relative weight and noise level received varying ratings from consultants, as they compared **AirLight M800-S** to other handpieces. Those who found it heavy also noted that it was well balanced. Twenty-five percent of consultants rated **AirLight M800-S** better than other high-speed

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Consultants' Comments

"No bulbs to replace!"

"Light is bright."

"Good balance and torque"

"Swivel coupler allows quick connection of the handpiece."

"Adequate air pressure is needed to operate the light."

"I like the fact that the light source is built into the handpiece without additional units or couplings."

handpieces they were using and 33% rated it to be equivalent. Forty-two percent would switch to **AirLight M800-S** and 50% would recommend it to a colleague.

Clinical Tip

- Clean and lubricate the handpiece before sterilization. ■

Venus White Pro

Heraeus
(800) 431-1785 | www.heraeusdentalusa.com

Description

Venus White Pro is a take-home whitening kit for custom trays. The carbamide peroxide whitening gel in the kits is available in concentrations of 16%, 22% and 35%, and in various kit configurations, to meet patient needs. The viscous whitening gel is mint flavored and contains potassium nitrate. For best results, **Venus White Pro** should be used with custom whitening trays for up to 14 days. Depending on the gel concentration and the patient's preference for time of day, whitening is achieved following the manufacturer's recommendations for use or recommendation by a dental professional.

Concentration	Daytime Use	Nighttime Use
35%	15 minutes, twice a day or 30 minutes once a day	--
22%	60 minutes once or twice per day	up to 8 hours
16%	4-6 hours per day	up to 8 hours

Suggested Retail Cost \$41.29/patient kit

Venus White Pro kits contain six syringes of whitening gel, paper shade guide, patient tray case, and instructions for use. Refill kits contain three syringes intended for touch-up applications. It is also available in 50 Syringe Packs, and a full line of patient marketing materials are available, including customizable pieces. **Venus White Pro** is just one offering within the complete family of Venus White teeth whitening and oral care products. **Venus White Pro** was evaluated by five consultants in 14 patient uses. This take-home whitening kit received an 88% clinical rating.

Product Features

Venus White Pro is provided in an attractive, professional-looking kit for dispensing to patients. Dentists and patients found the highly viscous, mint-flavored gel remained in the tray for effective whitening



Infection Control with Dr. John Molinari and Peri Nelson, B.S.

We have received numerous questions regarding the recent infection control incident in an Oklahoma oral surgery practice. Even though the official public health investigation is ongoing, a number of infection control problem areas were initially reported by the media. These have caused many patients to become concerned and ask questions about their dentist's practice procedures. In order to assist you in preparing for specific questions posed by your patients, we have developed a series of infection control discussion areas to consider with the whole dental team. Please visit THE DENTAL ADVISOR website to view and download this guide.

We also continue to be asked specific questions about other infection control issues. The following are recent examples:

1. Do my prescription glasses provide sufficient protection when treating patients?

While any form of eyewear will provide some level of protection against the splash/spray of blood or other body fluids, the style of many of today's frames are quite small and do not afford appropriate ocular protection. Disposable side shields, which are designed to fit all types of frames, provide a certain degree of additional protection. Unfortunately, if they are not placed correctly on the arm of the prescription glasses or they are not flush against the sides of the lenses, the opportunity increases for splash/spray to reach the eye. Therefore, specifically designed protective eyewear with side shields, or a face shield worn in conjunction with prescription glasses, or a disposable mask with face shield will provide the greatest barrier against aerosols and macroscopic debris.



Consultants' Comments

"The 35% gel whitens the teeth fast!"

"Nice patient kit."

"Some tooth sensitivity with all concentrations."

"I would like dosage marks on the syringes."

during the time of use. Half of the patients used the 22% gel and one-quarter each used the 16% and 35% gels. Over 60% of patients preferred to follow the nighttime whitening regimen. The amount of gel in each kit is adequate to produce significant whitening, and patients reported they were pleased with the results. Seventy-three percent of patients reported tooth and gum sensitivity with their whitening, 75% of which was mild to moderate. Twenty percent of consultants rated **Venus White Pro** better than other take-home whitening systems they were using and 40% rated it equivalent. Sixty percent would switch to **Venus White Pro** and recommend it to a colleague. Ninety percent of patients would recommend **Venus White Pro** to friends and family.

Clinical Tips

- Refrigerate the product when not in use.
- Instruct patients not to overfill trays, and instead use only a small pearl sized dab of gel for each tooth.
- Heraeus offers Venus Comfort Gel, containing potassium nitrate and fluoride, for patients that may be prone to sensitivity. ■

Seal-Tight®

Kerr TotalCare

(800) 841-1428 | www.kerrtotalcare.com

Description

Seal-Tight is a disposable air/water syringe tip designed to help prevent cross contamination. It requires a *Seal-Tight Conversion Kit*, which contains an adaptor that will remain on the air/water syringe. The adaptors are available in three models to fit most manufacturers' air/water syringes. The white and yellow plastic tip slides into the adaptor, which the manufacturer states has a unique interlock system that eliminates o-ring wear and tear that is experienced with other tips. **Seal-Tight** tips are manufactured with a central water channel and five air channels around the circumference of the tip. **Seal-Tight** is sold in 200- and 1500-count packages. **Seal-Tight** was evaluated by 34 consultants in over 6000 uses. This disposable air/water syringe tip received a 92% clinical rating.

Suggested Retail Cost

200-count package of syringe tips	\$42.23
1500	\$297.20

Product Features

Seal-Tight provided consistently dry air with no water contamination. The tip slides smoothly into the adaptor and is stable for the duration of the appointment. Consultants installed their adaptors with minimal effort, and the adaptors required no maintenance thereafter. The use of disposable air/water syringe tips minimizes cross-contamination, which is an important issue to consultants. The rounded tip of **Seal-Tight** is comfortable on soft tissue, and it is strong enough for retraction of cheek and tongue. Some consultants noted that air pressure through **Seal-Tight** was lower than through other tips. Fifty-five percent of consultants rated **Seal-Tight** better than other disposable air/water syringe tips they were using and 48% rated it better than metal syringe tips; 35% rated **Seal-Tight** equivalent to other disposable and metal tips. Seventy-one percent would switch to **Seal-Tight** and 85% would recommend it to a colleague.

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Consultants' Comments

"Absolutely no water contamination when using air!"

"We are switching all our syringes over to this system. I liked the quality of the adaptor, uniform spray, and quality of the tips."

"Spray was even and uniform. I could rotate the syringe tips, but they didn't twist during use."

"Disposable is the way to go."

"Tip could be a little longer with a greater angle."

Clinical Tips

- Installation of the appropriate adapter is necessary for each syringe prior to using **Seal-Tight** tips.
- Tip can be bent if a greater angle is desired. ■



2. Does the CDC recommend booster injections for people who received the HBV vaccine and who have had a positive serologic test for the protective antibody, anti-HBs?

Currently, a booster inoculation is not recommended. The key is to get tested within a few months after the third vaccine injection to make sure you have responded and produced sufficient levels of protective antibody. Later should you have subsequent serologic tests, even if the level of protective anti-HBs declines, immunological memory has been shown to last well over 25 years. The CDC continues to examine early test vaccine groups for possible cases of hepatitis B, and at this writing they have not found such infections.

Hg5 Amalgam Separator

SolmeteX
(800) 216-5505 | www.solmetex.com

Description

Hg5 Amalgam Separator provides containment of mercury and amalgam from dental waste lines and is ISO 11143 certified at greater than 99% efficiency. The system consists of the separator and a collection container and is installed in the main vacuum line. The unit can be either free standing or wall-mounted and works with both wet and dry vacuum systems. **Hg5 Amalgam Separator** accommodates up to 10 operatories; other models are available. The collection container, which can be changed by office staff or a technician without the use of tools, must be removed when full and sent for recycling. The purchase of each new canister includes delivery to a certified recycler, recycling and an online certificate for compliance verification. The *Hg5 Series* of amalgam separators also includes the *Hg5-Mini* (accommodating up to 4 operatories) and the *Hg5-HV* (accommodating up to 20 operatories). **Hg5 Amalgam Separator** includes a backplate, two mounting brackets, airwater separator and one collection container. **Hg5 Amalgam Separator** was installed in five dental offices and used during a six-month evaluation period. This amalgam separator received a 96% clinical rating.

Suggested Retail Cost	
System	\$825.00
Collection container with recycle kit	\$300.00

Equipment Features

Hg5 Amalgam Separator was evaluated in dental offices with three to five operatories. It integrates well with both wet-vac and dry-vac systems. After installation into the vacuum line, it was reported that there was no decrease in suction, and in one case the suction improved. The clear container makes it easy to read the level. The full container can be removed cleanly, and the new one is easy to attach. The company provides packaging for shipping the waste to the recycler, which encourages compliance. Consultants agreed that **Hg5 Amalgam Separator** performed its function with minimal monitoring and maintenance. Sixty percent of consultants rated **Hg5 Amalgam Separator** better than other amalgam separators they had used and 40% rated it equivalent. One hundred percent would switch to **Hg5 Amalgam Separator** and would recommend it to a colleague.

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Consultants' Comments

"Low maintenance system."

"Great solution for small spaces."

"I was concerned about changing the filter but was pleasantly surprised at the ease and cleanliness!"

"Great product; Not only are we cleaning up our environment, but we improved the suction quality in our office as well!"

"We place reminders in our schedule to check the canister."

"Canister collects all solids, including a lot of prophy paste."

"If installing the system yourself, be aware that plumbing fittings and hoses are not included."

Clinical Tips

- Proper personal protective equipment should be worn by individuals handling full collection container.
- Use a vacuum line cleaner with a pH of 6-10.
- Check container first thing in the morning every couple of weeks.
- Use a flashlight to shine through the clear canister to help view the sediment level. ■

AQUA Source

Cranberry USA

(888) 811-6839, (707) 553-6190 | www.cranberryusa.com

Description

AQUA Source Powder Free Nitrile Gloves, formulated with NuSoft™, are designed to provide a comfortable, form fit, and improved tactile sensitivity. They feature Cranberry's exclusive full-hand texture for improved grip. Micro-coated with Cranberry's proprietary blend of lanolin and vitamin E, **AQUA Source** gloves are reported to improve skin health and prevent dry skin irritation. **AQUA Source** aqua-colored gloves are packaged in 200-count space saver boxes and are available in sizes: extra-small, small, medium, large, and extra-large. **AQUA Source** gloves were evaluated by 39 consultants in over 2200 uses. These nitrile gloves received a 95% clinical rating.

Suggested Retail Cost \$16.90/box of 200

Product Features

The lanolin and vitamin E coating on **AQUA Source** gloves had a positive effect on the softness of users' hands. They are smooth and easy to put onto the hands. The nitrile material has some stretch, creating a comfortable fit for most consultants with less hand restriction. The unique "finger to cuff" Full Hand texture aids in gripping, since nitrile gloves tend to become slippery when wet. Consultants liked the aqua color. Some consultants noted an odor on their hands after removing the gloves. Sixty-two percent of consultants rated **AQUA Source** better

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Consultants' Comments

"I usually use latex gloves, but I was very happy with **AQUA Source**."

"They were smooth inside and my skin felt very soft and not dry after using them."

"They do not cramp my hands."

"The most comfortable nitrile gloves I have used, and I love the color."

"Very thin for good tactile feedback."

"Good fit around fingertips and they stretch a bit more than the brand we use now."

"Gloves are packed tightly in the box, and the first ones are hard to remove."

than other nitrile gloves they were using, and 28% rated them to be equivalent. Eighty percent would switch to **AQUA Source** and 95% would recommend them to a colleague.

Clinical Tips

- Users with sensitivity to lanolin should not use **AQUA Source** gloves.
- Completely dry hands before donning gloves. ■

BOSPHORUS Diamond Burs

Tekmetal San. Tic. Ltd. Sti.

+902126715104 | www.bosphorus.com.tr

Description

BOSPHORUS Diamond Burs are multi-use, friction-grip burs. The burs are manufactured with hardened stainless steel for the shanks and diamond plated heads. **BOSPHORUS Diamond Burs** are available in six color-coded grits (super-coarse to extra-fine) in numerous shapes and sizes. They are packaged with five diamonds in a plastic bur block. **BOSPHORUS Diamond Burs** were evaluated by 12 consultants in 241 uses. These diamond burs received a 91% clinical rating.

Suggested Retail Cost \$10.00 / 5 burs

Product Features

BOSPHORUS Diamond Burs exhibited excellent cutting efficiency, and most consultants found them to perform as well as their preferred diamonds. Durability was rated as very good for these multiple-use diamonds. The color bands that indicated grit did not fade or rub off after repeated use. The extensive selection of burs includes the most common shapes plus many others in a wide range of sizes and grits. Eight percent of consultants rated **BOSPHORUS Diamond Burs** better than other diamond burs they were using and 83% rated them equivalent. Sixty-seven percent would switch to **BOSPHORUS Diamond Burs** and 83% would recommend them to a colleague.

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Consultants' Comments

"Really great burs!"

"Durable after repeated autoclaving."

"Efficient cutting."

"Comprehensive selection of sizes and shapes."

"I would prefer individual packaging."

Clinical Tip

- To maintain peak performance, clean regularly with a bur-cleaning block during procedure. ■

Custom Infection Control Kits

Door to Door Dental, Inc.

(781) 344-0010 | www.doortodoordental.com

Description

Custom Infection Control Kits are individual patient kits of disposable supplies for chairside use. The manufacturer pre-packages the most commonly used dental supplies in convenient, ready-to-use kits. Kits can contain bibs, disposable bib holders, cotton rolls and gauze, saliva ejectors, high-volume evacuator tips, light handle, mouse and keyboard covers, masks, handpiece and suction sleeves, air/water syringe tips, gowns and other products. Individual items can be wrapped in plastic to reduce the probability of cross contamination, or are available in one plastic bag. Standard kits are available. Practices that order 1000 or more kits have the ability to create custom kits to suit their needs. The manufacturer claims that a 1000 kits fits in an area about 48"x21"x20". Cases of kits can be shipped every week, bi-weekly or monthly. Only the custom kits were evaluated. **Custom Infection Control Kits** were evaluated by 25 consultants in 426 uses. These kits received an 86% clinical rating.

Product Features

Dentists liked the concept of having all of their disposable items in one pre-packaged **Custom Infection Control Kit**. Each type of item in the bag was individually wrapped in plastic, but items are available loosely in one bag. Although consultants had the opportunity to customize their kits, they found that each procedure did not use the same number of items. In some cases, unused product was wasted. The ease of incorporating **Custom Infection Control Kits** into their practices varied among consultants. Dentists who did not use pre-set trays valued it more than those who did. Twenty-four percent of consultants rated **Custom Infection Control Kits** better than their current methods of organizing disposable items used in dental procedures and 24% rated the kits to be equivalent. Twenty-four percent would switch to **Custom Infection Control Kits** and 44% would recommend them to a colleague. ■



Consultants' Comments

"This 'grab-and-go' concept is great when the dental assistant is not available."

"It made my day a lot easier."

"Promotes infection control."

"Everything that is required for treatment is available in one package."

"I love the concept of having everything in one bag, just not the individual packaging."

"Great for mobile dentistry."

"Not every item is needed for each procedure."

SPECIAL THANKS TO:

Select Senior Clinical Consultants (Over 20 years):

J. Amara, CT · R. Fisher, OH · W. Gregory, MI · E. Katkow, MD · J. Lockwood, MI · J. Mayer, OH · W. Nagy, TX · G. Poy, MI · J. Shamraj, MI · R. Trushkowsky, NY · P. Yaman, MI

Senior Clinical Consultants (15-19 years):

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