



## Advantages and Challenges of Bulk-Fill Resins

**Gordon's Clinical Bottom Line:** Bulk-fill restorative resins are not a new idea. The concept has been on the minds of practitioners and manufacturers for many years, and numerous bulk-fill products have come and gone from the market over the past two decades. Recently, there have been a few new bulk-fill resin-based composites introduced, and several manufacturers, seeing the new bulk-fill products gaining some popularity, have brought some of the older products back on the market. *As in the past, this is a controversial and evolving topic. To assist in answering the controversy, this report makes clinical suggestions on the new and recently re-introduced products based on in-depth science information, clinical use characteristics, and observations from CR Evaluators.*

Filling all of a tooth preparation with composite at one time has obvious advantages, but the disadvantages are also apparent. CR scientists and Clinical Evaluators teamed up to study the previously unknown advantages and disadvantages of nine resin-based composite products that, according to their manufacturers, are capable of being placed in bulk.

### The potential advantages of bulk-filling are:

- Fewer voids may be present in the mass of material, since all of it is placed at one time.
- The technique would be faster than placing numerous increments if curing times were identical.
- It may be easier than placing numerous increments.

### The potential disadvantages of bulk-filling are:

- More voids may be present in the mass of the material, since it may be difficult to control the mass placement.
- Making adequate contact areas may be challenging unless adequate matrices are used.
- Effects due to shrinkage stress may be more pronounced when bulk-filled than when placed in increments, since the entire mass polymerizes at one time rather than in small increments.
- Polymerization of resin in deep preparation locations may be inadequate.

After observing the results of the following study, you will be able to accept or reject the investigated bulk-fill brands of resin-based composites and the techniques necessary to use them.

*Continued on page 2*



This large Class II restoration was replaced in increments with Herculite Ultra. Would bulk-fill have worked?

## Are Tooth-Colored Onlays Viable Alternatives to Crowns?

**Gordon's Clinical Bottom Line:** Indirect cast gold alloy onlays were long considered to be one of the best available tooth restorations for moderately broken down teeth. However, cast gold restorations have shown a rapid drop in use over the past few years, while ceramic restorations have gained in popularity. Laboratories report that in the last year, less than 5% of indirect restorations in the U.S., including full-crowns, were cast gold alloy. This notable change has disappointed many dentists committed to the proven reliability of gold alloy restorations. *Are tooth-colored onlays viable posterior tooth restorations, and how do they compare with crowns? In this Report, CR scientists and clinicians confirm that indirect tooth-colored laboratory-made onlays are acceptable and help you make these decisions.*

**What is an onlay?** It has been a common perception that a posterior tooth onlay must cover all of the cusps of the tooth. The current definition deviates from the historical one.

**An onlay has been defined** by U.S.A. dental benefit companies as a restoration that covers at least one cusp of a multi-cusp tooth. Most companies provide benefits for onlays, but most will not provide benefits for inlays that do not have cuspal coverage.

**Onlays are not popular.** It has been reported by an expert in dental benefit plans (*Tom Limoli of Limoli and Associates*) that during 2010 only about 2% of indirect restorations were onlays. It is estimated that

dentists using in-office milling (*CEREC or E4D*) probably accomplish most of these onlay restorations with only a few being laboratory made.

**Since most dentists do not have in-office milling machines, should they use more indirect tooth-colored onlays made by laboratory technicians?** Currently available ceramic and polymer materials can provide near optimum characteristics for onlays. They can be strong restorations, providing long-term esthetic service.

**This report lists the limitations of crowns, identifies the advantages and limitations of tooth-colored onlays, describes acceptable materials, and supports a proven successful clinical technique.**

*Continued on page 3*

## Products Highly Rated in CR Clinical Trials

**Instadose:** On demand radiation monitoring allows users to view their radiation exposure from any computer with internet access. (Page 6)



Easy connection of dosimeter to USB port

### The Moses:

Custom snore device is lab fabricated and accomplishes optimum open airway for successful outcome. (Page 6)



Appliance has open anterior airway

**Swerv3:** New lightweight and durable magnetostriuctive ultrasonic scaler operates the popular Swivel inserts. (Page 6)



Either 25K or 30K inserts may be used

## Advantages and Challenges of Bulk-Fill Resins (Continued from page 1)

### Ideal Bulk-Fill Resin Characteristics (Please compare with bulk-fill characteristics of products in table below)

**Polymerization shrinkage:** Less than conventional composite, incrementally

**Voids:** Composite properties that cause fewer voids when placed in bulk than when placed in increments

**Cure depth:** Cures to the depth of the deepest portion of the restoration with all types of lights (*halogen, LED, and plasma*)

**Contact area:** Properties that facilitate creation of adequate contact areas

### Characteristics of Bulk-Fill Resins Tested for this Report

CR scientists tested nine resin-based composites that specify bulk-filling or thick increment placement. A conventional composite (*Filetek Supreme Ultra*) was the control for comparison of material properties. The following chart shows the key findings.

Brand Company	Approx. Cost/ml	Viscosity	Volumetric Shrinkage	Maximum Stress Rate (Final Value)	Depth of Light Cure			Occurrence of Voids	Promoted for Use on Occlusal Surfaces
					Moderate Intensity with Recommended Cure Times	LED Fast Light: Valo (3 sec.)	Plasma Arc Fast Light: Sapphire (5 sec.)		
<b>Low Viscosity "Flowable" Composites</b>									
HyperFIL - DC (Dual Cure) Parkell	\$6	Low	Low viscosity precludes measurement with dilatometer (typically 3–6%)	12 MPa/min (3.2 MPa)	4 mm	2.0 mm	2.0 mm	Infrequent	Yes
SureFil SDR flow Dentsply Caulk	\$36	Low		5 MPa/min (1.6 MPa)	5 mm	2.0 mm	3.0 mm	Occasional	No
Venus Bulk Fill Heraeus Kulzer	\$32	Low		4 MPa/min (2.1 MPa)	4 mm	0.5 mm	0.5 mm	Occasional	No
X-tra base VoCo	\$36	Low		8 MPa/min (2.6 MPa)	4 mm	2.5 mm	3.0 mm	Infrequent	No
<b>High Viscosity "Conventional" Composites</b>									
Alert Pentron	\$21	High	2.4%	12 MPa/min (2.8 MPa)	6 mm	2.5 mm	3.0 mm	Frequent	Yes
QuiXX Dentsply Caulk	\$36	High	1.6%	10 MPa/min (2.3 MPa)	5 mm	5.0 mm	5.5 mm	Occasional	Yes
SonicFill Kerr	\$43	Medium–High	1.8%	13 MPa/min (2.4 MPa)	6 mm	5.0 mm	4.5 mm	Frequent	Yes
Tetric EvoCeram Bulk Fill Ivoclar Vivadent	\$41	High	1.8%	8 MPa/min (2.2 MPa)	4 mm	4.0 mm	4.0 mm	Frequent	Yes
X-tra fil VoCo	\$35	High	1.8%	10 MPa/min (2.5 MPa)	6 mm	5.0 mm	4.5 mm	Frequent	Yes
Filetek Supreme Ultra 3M ESPE (control)	\$58	High	2.4%	6 MPa/min (2.8 MPa)*	3 mm	3.0 mm	3.0 mm	Frequent	Yes

\*Values generated using Filetek Supreme Plus

### Summary of Testing

- **Viscosity:** Low viscosity flowable resins were faster and easier to place and exhibited fewer voids, but generally had less depth of cure and some were not promoted for use on occlusal surfaces. SonicFill's vibrating delivery system reduced viscosity during extrusion, followed by gradual thickening to facilitate final contouring.
- **Shrinkage:** Volumetric shrinkage results from resin polymerization. Lower values are generally associated with less stress and fewer defects. High viscosity bulk-fill resins had shrinkage of 1.6–2.4%, which is typical for dental resins. Low viscosity flowable resins typically have shrinkage of 3–6%. *QuiXX exhibited the least shrinkage.*
- **Maximum stress rate** is the highest rate of tension development exhibited by the material as it polymerizes and shrinks in a tensometer. High stress rates and high final stress values can result in clinical defects, including white lines, cracks, debonding, etc. Stress development depends on resin formulation, polymerization kinetics, and shrinkage. Data are based on 2 mm thick samples. Literature shows higher stress can be expected with thicker resin layers. Most bulk-fill resins had stress values within the

typical range for resin-based composites. *SureFil SDR flow and Venus Bulk Fill exhibited the least stress.*

- **Depth of cure:** Bulk-fill implies deep cure to eliminate layering. Depth of light cure was 4–6mm using a moderate intensity LED light and the resins' recommended cure times of 10 to 40 seconds. Depth of cure was reduced by 0.5–5.5mm when using fast cure lights. *All light-cure resins require multiple layers when restoring deep box forms, which partially negates the time savings and convenience.* SonicFill, QuiXX, and X-tra fil exhibited the greatest depth of cure across all lights tested. *Only the dual-cure resin, HyperFIL-DC, was truly "bulk-fill," auto-polymerizing to any depth within 2–4 minutes after dispensing.*
- **Voids:** The frequency and size of critical voids located at the margin and along line angles were less pronounced with flowable resins than with conventional putty-like resins.
- **Overall, SonicFill, QuiXX, X-tra fil, and SureFil SDR flow had the greatest number of desirable characteristics for the bulk-fill application.**

### CR Clinical Tips

**Placement and curing of resin in incremental layers is still the most accepted method due to previously discussed challenges with bulk-fill. Typical incremental method for a deep box form: thin layer (~0.5 mm) in deepest portion, then 1 mm layer, then 2 mm layers as necessary. Practitioners should consider the following when choosing a bulk-fill technique:**

**Contact areas and matrices:** Sectional matrices should be used to produce adequate contact areas. Highly successful matrices are produced by Dentsply, Garrison, and TrioDent. See *Clinicians Report Buying Guide December 2011*.

**Curing lights:** Deep cure requires adequate light energy. Verify performance by curing a long (7 mm) piece of resin from one end using customary cure time. Scrape away uncured portion. The hardened resin shows approximate depth of light penetration, although adequate polymerization is really only a portion of this total depth. Increase cure time to achieve desired depth of cure.

**Heat:** Long cure times, especially with high intensity lights, can potentially cause heat damage to pulp and other tissues. Dissipate heat by directing an air stream onto tooth during exposure. Inform staff of heat issue and cooling technique since they perform these tasks in most offices.

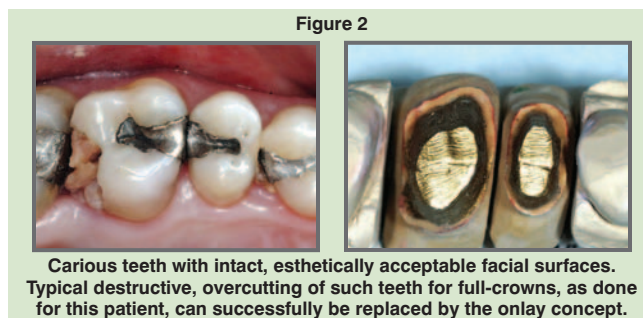
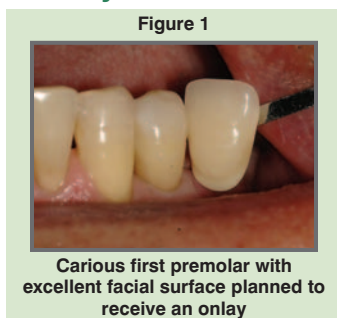
**Homogeneous placement.** When using bulk-fill, the entire mass must be placed as void-free as possible. Carefully add material without trapping voids in line angles or between layers. If dispensing flowable resin, keep tip embedded in mass while extruding and use tip to push resin into corners.

**CR Conclusions:** Currently, incremental placement is the most researched and supported filling and curing method. Current bulk-fill resins show potential improvements in some properties, but the following challenges still exist for *most* materials: 1) volumetric shrinkage and stress is not less than other conventional restorative resins, 2) light cure does not reach the bottom of deep preps, 3) fast curing lights do not deeply cure bulk-fill resins, 4) some flowable resins cannot be used on occlusal surfaces, 5) making tight contact areas can be difficult, and 6) preventing voids in crucial locations is unpredictable. At this time, bulk-filling as a concept may have promising potential and may perform well in certain situations, but material improvements are necessary to overcome the described challenges.

# Are Tooth-Colored Onlays Viable Alternatives to Crowns? *(Continued from page 1)*

## Limitations of Crowns when Compared to Onlays

**Removal of viable, esthetically acceptable, and strong tooth structure.** Many teeth planned to receive crowns have previously placed large intracoronal restorations in them at the time they are prepared, but the facial and lingual tooth surfaces are intact and esthetically acceptable. *(Figure 1)*



Unfortunately, when making tooth preparations for full-crown restorations, many teeth have most of the facial and lingual surfaces of the tooth removed to allow space for the full-crown material, leaving the broken down and/or previously restored intracoronal portion of the tooth. *(Figure 2)*

**Requirement for building-up teeth for crowns is traumatic.** The result of making a full-crown restoration on the described teeth is that the strong and esthetically acceptable facial and lingual tooth structure is removed, and the previous restorative material replacing the removed intracoronal tooth structure has to be replaced with a “build-up” material. Such technique threatens the dental pulp, requires significant time, has more material cost, and forever removes the esthetic facial tooth structure.

**Crowns can soon become unacceptable esthetically.** As gingival tissues recede, crown margins are exposed, often exposing unsightly, chalky ceramic, metal, or just a different color from the remaining tooth structure.

## Advantages of Onlays or Partial Crowns vs. Full Crowns

*Partial crowns are similar to onlays but are slightly more extended apically on the lingual or wrapped around the distal facial surfaces.*

- Minimal tooth structure is removed.
- The esthetic facial tooth structure is preserved.
- When the soft-tissue recedes, the natural tooth structure is shown, instead of a chalky, opaque, or metal containing margin.
- Most onlay margins are supragingival, allowing easier impressions.
- The supragingival margins allow easy margin finishing and cement removal.
- Research on onlays over many years supports clinical success.

## Limitations of Onlays or Partial Crowns vs. Full Crowns

- Many dentists are unfamiliar with the onlay technique.
- Some dentists feel that making tooth preparations for onlays is more difficult than for crowns. Experienced clinicians deny this point.
- Some dentists feel that cementing onlays is more difficult than cementing crowns. Experienced clinicians deny this point and find cementation easier than crowns.

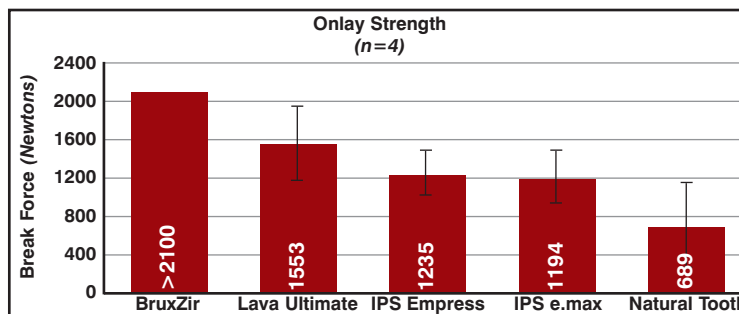
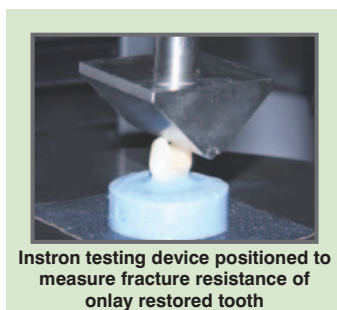
## Material Characteristics of Tooth-Colored Onlays

Material (example brand tested)	Fabrication Process	Esthetics	Ease of Achieving Fit	Ability to Repair	Removal when Failed
Leucite-Reinforced Ceramic (IPS Empress)	Milled or pressed	Excellent	Excellent	Short term with resin	Easy
Lithium Disilicate (IPS e.max)	Milled or pressed	Very Good	Very Good	Short term with resin	Difficult
Polymer (Lava Ultimate)	Milled or polymerized	Very Good	Excellent	Yes	Easy
Zirconia (BruxZir)	Milled	Good	Very Good	No	Very difficult

## Strength of Onlays

### Test Methods

Four onlays of each of the above materials were prepared and cemented on premolars using a standard technique *(see page 4)* and Multilink Automix (Ivoclar Vivadent) cement. Strength was measured by loading cusps at 1 mm per minute with a steel wedge until failure while recording force. Unrestored natural teeth were used as controls.



### Test Results

As expected, BruxZir zirconium onlays were significantly stronger than other materials and exceeded the 2.1 kN limit of the Instron 5944 test apparatus. Surprisingly, Lava Ultimate polymer onlays were the next strongest, although not significantly different from IPS Empress or IPS e.max. Despite the high variability inherent in this study, **all onlay materials were shown to have higher strength and resist cuspal fracture better than unrestored natural tooth structure.**

*Onlay fabrication for this study was graciously provided by Glidewell Laboratories, Newport Beach, California (www.glidewell dental.com).*

## Are Tooth-Colored Onlays Viable Alternatives to Crowns? (Continued from page 3)

### CR Suggested Clinical Technique for Laboratory Fabricated Tooth-Colored Onlays and Partial Crowns

*Dentists using in-office milling may also use the following cementation technique with predictable success.*

1. Prepare tooth.
2. If carious lesion was deep, provide suggested two 1-minute applications of glutaraldehyde solution while avoiding soft tissues (examples: G5, Gluma, GluSense, Microprime G).
3. If carious lesion is deep, place thin layer (~0.5 mm) of resin-modified glass ionomer (example: Fuji Lining Cement, Vitrebond).
4. Make impression using material of dentist's choice. *If making digital impression for in-house milling, omit steps 5 and 7.*
5. Make provisional restoration, cemented with eugenol-based provisional cement to reduce possibility of postoperative tooth sensitivity. Most popular provisional restorative material is bis-acryl such as Integrity, Luxatemp, Prottemp Plus, etc. CR research has shown that use of eugenol containing provisional cement is not a problem with subsequent resin cement if ten days to two weeks elapse between provisional cementation and final cementation with resin cement.
6. Lab makes onlay or onlay is milled in office by CEREC or E4D device.
7. Remove provisional restoration if using lab-fabricated restoration and clean tooth preparation with flour of pumice and water.
8. Treatment of onlay internal surface:
  - a. IPS Empress (*leucite reinforced ceramic*): Accomplish 5% hydrofluoric acid etching of internal of ceramic restoration; rinse and dry; and place silane on inside of restoration for 60 seconds (examples: Clearfil Repair, interface, Monobond Plus).
  - b. IPS e.max (*lithium disilicate*): Accomplish 5% hydrofluoric acid etching of internal of ceramic restoration; rinse and dry; and place silane on inside of restoration for 60 seconds.
  - c. Lava Ultimate (*polymer*): Sand blast internal of restoration, being careful to avoid damaging fragile margins, place silane on inside of restoration for 60 seconds.
  - d. BruxZir (*full-zirconia*): Sand blast internal of restoration, being careful to avoid damaging fragile margins; rinse and dry (*silane not needed*).
9. Etch enamel margins with phosphoric acid gel (example: Ultra-Etch from Ultradent Products).
10. Desensitize the tooth with glutaraldehyde, suggested to be applied for two 1-minute applications.
11. Seat with bonded resin cement (examples requiring pre-cementation primer: Clearfil Esthetic Cement (current version of Panavia) and Multilink Automix; examples with self-etch incorporated into the cement: Maxcem Elite and RelyX Unicem 2).
12. Cure the resin cement, being careful to cure minimally to avoid the inability to remove cement debris. Using the cements suggested above, the initial curing of cement with a fast light should be no more than one or two seconds on the facial and lingual respectively, followed by removal of the partially cured cement. Run floss through the contact areas to clear them of cement. Then full cure of facial and lingual surfaces.
13. Trim the cement from the margins.
14. Carefully evaluate and adjust the occlusion.



Example specimen onlay tooth preparation used in study



Full-Zirconia onlay study specimen ready to be cemented

### CR Clinical Tips

**Observe the remaining tooth structure.** If the facial and lingual surfaces of the tooth are intact without horizontal cracks, discoloration, or excessive gingival recession showing discolored dentin, onlays should be considered instead of crowns.

**Full occlusal coverage.** For optimum resistance to fracture during service, coverage of all cusps with onlay restorations is recommended. Leaving one or more cusps uncovered invites failure of the uncovered cusp(s).

**Preparations for in-office milling restorations vs. indirect laboratory made restorations.** Tooth preparations for laboratory made restorations can be nearly conventional onlays with “box forms,” near parallel walls, and some color blending bevels on observable margins, such as the facial margins (see photo at top of page). Laboratory fabricated restorations differ from those for in-office milling with CEREC or E4D which requires tooth preparations that do not have sharp angles, have “butt joint” margins, and have significant divergence on all aspects of the preparations.

**Postoperative tooth sensitivity.** In the past, this problem has been present frequently in onlays. However, when glutaraldehyde is used as a desensitizer and resin-modified glass ionomer is used as a liner in the deepest portions of the tooth preparation as suggested, this can be almost totally avoided.

**Cement.** Onlays require resin cement for optimum success (examples: Clearfil Esthetic Cement, Multilink Automix, RelyX Unicem 2)

**Informed Consent.** When suggesting all-ceramic restorations to patients, they should be informed about the potential for more fractures than with conventional PFM or metal crowns.

#### Benefit Codes for Tooth-Colored Onlays and Crowns

2-surface onlay, ceramic: D2642	2-surface onlay, polymer: D2662
3-surface onlay, ceramic: D2643	3-surface onlay, polymer: D2663
4-surface onlay, ceramic: D2644	4-surface onlay, polymer: D2664
Crown, 3/4 ceramic: D2783	Crown, 3/4 polymer: D2712

**CR Conclusions:** The current generation of tooth-colored onlays are competitive with crowns for teeth with a moderate amount of tooth structure missing and with intact and esthetically acceptable facial surfaces. Teeth restored with onlays made of leucite-reinforced ceramic, lithium disilicate, polymer, or zirconia and covering all of the occlusal surfaces are equal in strength or stronger than unrestored natural teeth, provide optimum esthetics on the facial tooth surfaces, will receive benefits from most U.S.A. third-party benefit companies, and may be esthetically more acceptable than crowns over the years they are required to serve. When fabricated and cemented properly, they should be considered to be desirable and acceptable competitors for crowns.

# CE Self-Instruction Test—January 2012

*“Clinical Success is the Final Test”*

- 1 Earn Up to 11 Credit Hours.** Receive 1 credit hour for successful completion of each month’s test (*January 2012 through November 2012*). This is a self-instruction program. CR Foundation is an ADA CERP recognized provider and an AGD approved PACE program provider.
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**CE Self-Instruction Test—January 2012** *Check the box next to the most correct answer*

1. The tested bulk-fill resins have \_\_\_\_\_ polymerization shrinkage and stress when compared to conventional resin-based composites.
  - A. Significantly more
  - B. Significantly less
  - C. About the same range of
  - D. Unknown
2. The following material is semi-flowable on placement and becomes more putty like as final placement is accomplished:
  - A. HyperFIL
  - B. SonicFill
  - C. X-tra fil
  - D. QuiXX
3. In this study, fast cure lights cured bulk-fill resins \_\_\_\_\_ conventional moderate-intensity light.
  - A. Deeper than
  - B. Less deep than
  - C. The same as
  - D. Better than
4. Onlays made from the tooth-colored materials tested in this study and covering all cusps of posterior teeth were on average \_\_\_\_\_ the control natural teeth.
  - A. Stronger than
  - B. Weaker than
  - C. The same strength as
  - D. The same strength as or weaker than
5. The strongest onlay material tested was:
  - A. Zirconia
  - B. Lithium disilicate
  - C. Leucite reinforced ceramic
  - D. Polymer
6. An advantage of onlays compared to crowns is:
  - A. Preserves facial and lingual tooth structure
  - B. Can maintain acceptable esthetic appearance longer
  - C. May not require a build-up
  - D. All of the above
7. Onlays require \_\_\_\_\_ cement for optimum success.
  - A. Resin-Modified Glass Ionomer
  - B. Polycarboxylate
  - C. Zinc phosphate
  - D. Resin
8. The Instadose device is remarkable due to the ability of this:
  - A. Radiation monitoring badge to accumulate the individual clinician’s dose and provide graphical representations on any computer connected to the internet
  - B. Injection system to deliver local anesthetic painlessly
  - C. Resin-based composite delivery system to bulk-fill preparations without voids
  - D. Radiation badge to flash when a daily radiation level is excessive
9. Moses Appliance is a custom lab-fabricated device for:
  - A. Prevention of bruxing and clenching
  - B. Snore prevention that works by opening the airway in a comfortable and controlled manner for individual patients
  - C. Minor tooth movement and minimal orthodontic needs
  - D. Home delivery of bleaching gels
10. Swerv<sup>3</sup> ultrasonic unit by HuFriedy operates using:
  - A. Piezo electric technology and has unique tips designs
  - B. Sonic energy derived from high-speed handpiece air and water lines
  - C. Magnetostrictive technology for either 25K or 30K inserts including the popular HuFriedy Swivel inserts
  - D. Piezo ceramic technology; accepts various companies tips

**3 Print Participant Information.** For additional participants, photocopy this page and list requested information.

Name \_\_\_\_\_ Email \_\_\_\_\_

Address \_\_\_\_\_ Phone \_\_\_\_\_

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 December 15, 2012**

## Products Highly Rated in CR Clinical Trials (Continued from page 1)

### Immediate Reading of Radiation Exposure

#### Instadose



\$189/Year per badge

This badge (*dosimeter*) has a built-in memory chip that stores each user's identity with an embedded unique serial code. When a user receives Instadose, they first register at: [www.instadose.com](http://www.instadose.com). During the registration process, the Instadose software and clinician information are set up on the computer, and the device is activated. When the user wishes to obtain a reading, they log-in to their account, plug the Instadose into a USB port, and click "Read Device." The accumulated dose stored on Instadose is processed. This fully automated transfer of data minimizes the chance of human error and misidentification. Once complete, a graphical representation of the current dose will load on the screen and various reports can be generated. Badge has unlimited readings and may be re-assigned.

#### Advantages:

- Easy to set up and wear the small Instadose dosimeter
- Easy access to a variety of reports: Radiation Exposure Summary, History Detail, Who Has Not Read Their Device, and others
- Eliminates badge collection and return process

#### Limitation:

- Cost: convenience of immediate access to exposure data requires annual fee

#### Quantum Products

800-359-9686 • [www.instadose.com](http://www.instadose.com)

**CR Conclusions:** 85% of 20 CR Evaluators stated they would incorporate Instadose into their practice. 95% rated it excellent or good and worthy of trial by colleagues.

### Effective Snore Prevention Device Produces Optimum Airway Opening

#### The Moses



\$329/Appliance

This snore prevention system uses a logical eight-step bite protocol to measure the vertical and protrusive measurement and captures the optimum open airway for a successful outcome. Instructions are clear and concise and video of procedure is available online at [www.themoses.com/bite](http://www.themoses.com/bite). All teeth are maintained in their position by use of upper retainer and acrylic appliance. Also promoted for sleep apnea which was not tested by CR.

#### Advantages:

- Comfortable and easy to wear for most patients
- Dentist supervised for excellent adaptation to teeth and tissues
- Well made, high quality appliance
- Appliance is adjustable and has open anterior airway
- Less invasive than C-Pap or uvulopalatopharyngoplasty (UPPP)

#### Limitation:

- Appliance is contra-indicated for children whose teeth have not fully erupted

#### Modern Dental Laboratory USA

877-711-8778 • [www.moderdentalusa.com](http://www.moderdentalusa.com)

**CR Conclusions:** 63% of 19 CR Evaluators stated they would incorporate Moses Appliance into their practice. 84% rated it excellent or good and worthy of trial by colleagues.

### New Lightweight Magnetostrictive Scaler Operates the Popular Swivel Inserts

#### Swerv<sup>3</sup>



\$2,450/System  
(25K or 30K unit)

This lightweight and ergonomic magnetostrictive scaler is available in either 25K or 30K models. Many practices have purchased the popular Swivel inserts for their ultrasonic scalers. This device has two easily adjustable color-coded power modes for various patient needs and comfort. It has easy to read digital display. Lightweight handpiece and durable, lightweight cord minimize hand fatigue. Swivel inserts allow for single-handed intraoral adjustment of tip for best access and thorough scaling.

#### Advantages:

- Small unit is lightweight and portable
- Easy to install and control power levels
- Comfortable for clinician; lightweight ergonomic handle
- Excellent calculus removal

#### Limitation:

- Handpiece and cord are not autoclavable and require barrier sheath for infection control

#### Hu-Friedy

800-729-3743 • [www.hu-friedy.com](http://www.hu-friedy.com)

**CR Conclusions:** 70% of 16 CR Evaluators stated they would incorporate Swerv<sup>3</sup> into their practice. 100% rated it excellent or good and worthy of trial by colleagues.