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# ADMINISTRATION

## 59-01 SuperGel Fresh Alginate Complaints

Clinicians from three USAF dental clinics recently contacted DIS to report dissatisfaction with the mixing consistency of the currently-stocklisted alginate, SuperGel Fresh (Harry J. Bosworth Company). They reported that the material was "clumpy" after mixing and seemed dry. The alginate at the three clinics was of the same lot (9904 238, with expiration date of 04/2001). The reporting individuals were advised to file SF 380s (Reporting and Processing Medical Materiel Complaints/Quality Improvement Reports) with the Defense Support Center in Philadelphia. Discussions with the manufacturer indicated that the version supplied to these clinics has since been compositionally modified to produce a smoother, creamier consistency. The Bosworth Company provided samples of the modified (ie, "new") version to DIS for evaluation. DIS also obtained samples of the "old" version of SuperGel Fresh and the previously stocklisted alginate, Jeltrate (Dentsply/Caulk) for laboratory testing of their degree of detail reproduction and gypsum compatibility. **It is important to note that the "old" version of SuperGel Fresh produced test results comparable to those seen with Jeltrate. The primary differences between them were their consistency and surface texture. If your clinic currently has the "old" version in stock and is having no problems, there is no need to replace it.** Mixes made with the "old" version were thicker and oatmeal-like on the surface, while Jeltrate was smoother and less viscous. **The "new" or modified SuperGel Fresh, however, has a viscosity and surface texture comparable to that of Jeltrate.** The Bosworth Company has since replaced the cans of alginate at the facilities that initiated the complaints and has agreed to provide cans of the "new" version of alginate at no charge to federal dental clinics that would like them. If your clinic is currently using SuperGel Fresh alginate and you wish to have the "new" version, please contact Bosworth for replacement. In your communication, please tell the company how many cans you need and provide your complete mailing address. Requests should be sent to:



Harry J. Bosworth Company  
7227 North Hamlin Avenue  
Skokie, IL 60076-3999  
Attn: Mr. Herbert Pozen

If more convenient, requests may be sent by fax to (847) 679-2080.

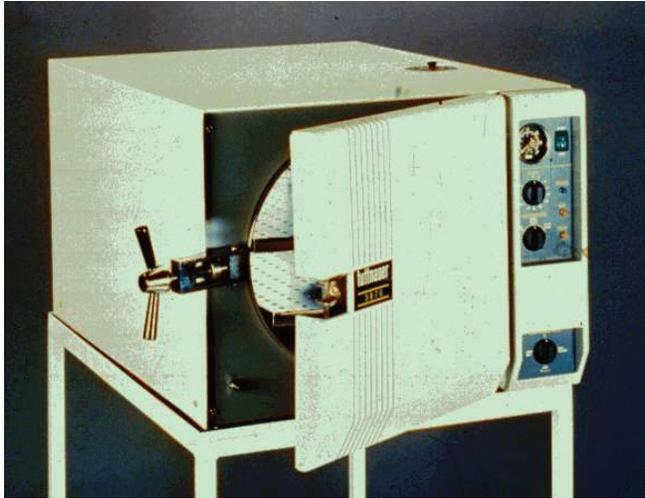
(Col Charlton)

## 59-02 Tuttnauer Model 3870E/P 15-inch Sterilizer Complaints

It has come to the attention of DIS, that some clinics have reported reliability, repair, and customer service problems with the Tuttnauer Model 3870E/P 15-inch Sterilizer. One example from an Air Force base in California involved on-going warranty service problems with their 15-inch Tuttnauer sterilizer. The sterilizer was purchased from Tuttnauer USA, Ronkonkoma, NY and installed in February 1999. Soon after installation, the unit had problems: cycles would abort and error messages indicated it was because of "Low Temperature," "Low Water," and "Low Pressure." The base contacted Tuttnauer and the factory-authorized warranty repair service responded, but several attempts to resolve the problems were unsuccessful. Tuttnauer determined that the problems were caused by insufficient power to the unit. The facility increased the power to the sterilizer from 208 volts to 220 volts, but the unit still had

intermittent problems. The local warranty repair service and Tuttnauer determined that the sterilizer needed to be sent to Tuttnauer's New York repair facility. Repaired and returned, the sterilizer was operated by the clinic and it failed 5 out of 6 cycles. The regional Tuttnauer representative along with a service technician then responded on-site but were not able to resolve the problems. The sterilizer was again returned to Tuttnauer for warranty repair. Tuttnauer decided in November 1999 to replace the problematic 15-inch sterilizer with a new one. It is important to note that the clinic was without access to the sterilizer for nearly a year.

To determine if this was an isolated problem, DIS contacted Biomedical Engineering Technicians (BMETs) at bases with the Model 3870E/P sterilizers. Fifteen Air Force bases reported having 23 Model 3870E/P sterilizers (purchased between 1995 and 1998), and more than half of the bases reported problems with them. The facilities contacted by DIS reported problems that included melting or burning of instrument packs, aborted cycles (indicated by "Low Temperature," "Low Water," and "Low Pressure" readouts), water clogs within the sterilizer, and failed or leaky door gaskets. Most of the problems were corrected on-site by the warranty repair services or by the facilities' BMETs. However, indicative of Tuttnauer service, on one occasion the local BMET had to instruct the authorized Tuttnauer service technician how to install a door gasket. One base is still having warranty repairs made to two of their three 15-inch sterilizers.



There are several steps that personnel can take in maintaining their sterilizers to prevent operational problems. Tuttnauer recommends using distilled water and keeping the sterilizer chamber and plumbing clean. It is also very important to properly calibrate the amount of water the sterilizer dispenses into the chamber for a cycle. Note that the water calibration must be redone if the sterilizer is moved to a new location. The water sensor located inside and at the back of the chamber should be cleaned periodically. Finally, the air jet trap located in the water reservoir should be cleaned every week. This is done by manipulating the air trap wire back and forth while the sterilizer is operating.

Tuttnauer recently established a national repair service in the United States. If you are experiencing problems with your sterilizer and the unit is still under warranty, contact Jerry Fitzsimons at Tuttnauer (800) 624-5836. The Tuttnauer Model 3870E/P Sterilizer was previously rated "Acceptable" by DIS (see *Dental Items of Significance* 47-37), but **due to the recently discovered on-going problems and slow warranty service responses from Tuttnauer, DIS recommends not purchasing the Tuttnauer 15-inch E/P sterilizer.**

(Mr. King, Lt Col Roberts)

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### 59-03 Solicitation for Clinical Evaluators

DIS is looking for clinicians interested in evaluating the clinical handling characteristics of dental materials. Products to be evaluated include a wide range of materials including cements, resin composites, glass ionomers, bonding agents, impression materials, and bleaching agents. The evaluations basically involve using the product for 3 months, completing a detailed questionnaire about its instructions and handling, and returning the questionnaire to DIS. Clinicians from all branches of the service, as well as the Veterans Administration, and Public Health Service are eligible. Being a clinical evaluator for DIS gives you and others at your clinic the opportunity to use state-of-the-art products free of charge. Generally, DIS seeks two or more evaluators at every clinic so several opinions about each

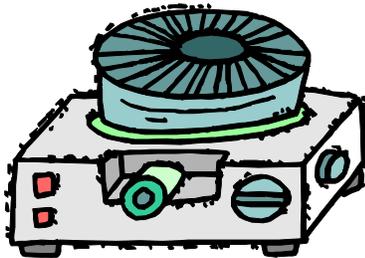
product are gained from the evaluation. Time remaining on station should be 12 months or longer. To obtain more information about how the process works and/or to let us know that you are interested, please e-mail david.charlton@ndri.med.navy.mil.

(Col Charlton)

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### 59-04 Bloodborne Pathogens Training Briefing

(Project 99-56)



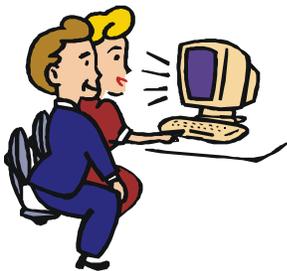
DIS has prepared a Bloodborne Pathogens training briefing that is available from the DIS website under "Download." The 63-slide briefing can be downloaded in either Powerpoint 4.0 or 7.0 versions. It is designed to augment initial and annual training requirements and may be edited to meet local requirements. Please be aware that formatting changes may occur between different Powerpoint versions and slight editing may be required after downloading. This briefing joins the Radiation Safety, Infection Control, Clinic Health and Safety, and Dental Forensics presentations already available on the website.

(Col Bartoloni)

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### 59-05 Maxillofacial Trauma Briefing

(Project 99-03)



DIS currently has several Powerpoint briefings on the DIS website that have been produced in a collective effort to provide teaching resources to federal dental clinics in meeting yearly mandatory training requirements. A Maxillofacial Trauma briefing has recently been completed with the assistance of Lt Col Jeff Armstrong of 59 MDW OMFS and is now available. Because of the size of the file (12 MB), it has been placed on this CD instead of on the web site. The briefing, available in both PowerPoint 4.0 and 7.0 versions, is located in the "Trauma" directory.

(Lt Col Roberts)

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### 59-06 Meeting the DIS Staff

In each issue of *Dental Items of Significance*, we feature a different member of the DIS staff and provide some brief biographical information about him or her. We hope that in providing a brief biography of the staff, we will become more familiar to you so that when you call with a question or to discuss a matter, you will feel that you have a friend at the other end of the line. This issue's staff member is Col (Sel) Greg Browning.

Greg was born and raised in the Midwest, living in Ohio and Indiana for most of his childhood. He attended dental school at Indiana University, living a short one-mile jog from the Indy 500 race track. After dental school graduation in 1982, he was commissioned in the Air Force and spent his first year in a General Practice Residency at Langley AFB, Virginia. His first assignment following the GPR was back in his home state at Grissom AFB, Indiana. There he married Jeanne and the Brownings then spent the next 4 years at Rhein-Main AB, Germany. They left Germany in 1991, moving to Keesler for two years where Greg was a resident in the General Dentistry Residency. Following a three-year stint at Mt Home AFB, Idaho, it was time to return overseas, this time to Misawa AB, Japan. The family had now grown to five and they found Misawa to be one of the best-kept secrets in the Air Force. After having several



great camping, hiking, and skiing adventures in Misawa, they moved in 1998 to San Antonio where Greg serves in his current position in facility design at the Dental Investigation Service. Greg is board certified by the Federal Services and American Boards of General Dentistry. He and Jeanne have three children, Nick (12), Kate (10), and Eric (6).

# QUESTIONS & ANSWERS

"Questions & Answers" is a feature in which we present and answer the questions we most frequently receive from the field. This month we feature a questions about new resin cements and an innovative system for fabricating crown and bridge substructures. Should you want more information about a particular topic, please contact the individual whose name follows the specific answer in which you are interested. If you have a question about a topic not discussed in this issue, feel free to call DIS at DSN 240-3502.

## 59-07 Cross compatibility of Resin Composites and Dentin Bonding Agents

**Question:** Our clinic has the 3M's Scotchbond Multi-Purpose Adhesive Plus as our primary bonding product. Do we need to use 3M's composite resin with it or can we use another company's composite if we want to?

**Answer:** This is a question that I frequently receive at DIS and it is an important one. Quite commonly, representatives from dental product companies will encourage you to purchase their company's bonding agent **and** resin composite by claiming that the result will not be as good if you don't. In other words, they say that using their bonding agent with a competitor's resin composite (or vice versa) will produce an inferior result. The research, however, does not support this claim. No clear evidence exists that using a bonding agent from one manufacturer with a resin composite from a different manufacturer has an adverse effect on parameters such as microleakage<sup>1</sup> or bond strength.<sup>2,3</sup> Evidence does exist that appears to show a difference in bond strength between resin composites, which has led some researchers to recommend using the same manufacturer's resin composite and bonding agent.<sup>4</sup> The differences, however, may well be due to differences in strength between the types of resin composites<sup>5,6</sup> (eg, hybrids versus microfills) rather than a result of compatibility differences between bonding agents and resins. Likewise, a difference in microleakage found in one study was attributed to the resin composite type rather than brand.<sup>1</sup>

1. Crim GA. Influence of bonding agents and composites on microleakage. *J Prosthet Dent* 1989;61:571-574.
2. Chan DCN, Reinhardt JW, Boyer DB. Composite resin compatibility and bond longevity of a dentin bonding agent. *J Dent Res* 1985;64:1402-1404.
3. Baker JF, Murchison DF, Charlton DG, Vandewalle K. Cross compatibility of fifth-generation dentin bonding and composite systems [Abstract]. *J Dent Res* 1998;77:132.
4. Leirskar J, Øilo G, Nordbø H. In vitro shear bond strength of two resin composites to dentin with five different dentin adhesives. *Quintessence Int* 1998;29:787-792.
5. Perdigao J, Swift EJ, Cloe BC. Effects of etchants, surface moisture, and resin composite on dentin bond strengths. *Am J Dent* 1993;6:61-64.
6. Hasegawa T, Itoh K, Koike T, Yukitani W, Hisamitsu H, Wakumoto S, Fujishima A. Effect of mechanical properties of resin composites on the efficacy of the dentin bonding system. *Oper Dent* 1999;24:323-330.

(Col Charlton)

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## 59-08 Newly-Marketed Resin Cements

**Question:** It seems that dental companies are marketing a lot of new resin cements lately. It is hard to keep track of them and to figure out how they differ. What is DIS's opinion about the new products?

**Answer:** As mentioned in one of the "Question & Answers" from our last newsletter, manufacturers have devoted a great deal of time and money to developing new brands of resin cements. They realize there is a need for luting agents that can be used for successfully cementing esthetic restorations such as all-ceramic, porcelain, and resin-composite restorations. Resin cements as a group are well suited for these restorations because of their high compressive strength and low solubility. They can also be formulated in different shades to produce an esthetic result for translucent restorations. DIS has published comprehensive synopses of resin cements in previous newsletters (for the most recent, see *DIS 55-11*), however we have continued to evaluate new resin cements as they have been introduced and it can be difficult for readers to keep them all straight because each has its own characteristics. To make it easier to differentiate between the most-recently evaluated products (Variolink II, Calibra, and RelyX ARC), their most relevant characteristics have been listed in the following table. Please note that the information is from the manufacturers.

<b>Product</b>	Calibra	RelyX ARC	Variolink II
<b>Company</b>	Dentsply/Caulk (800) 532-2855	3M (800) 237-1650	Ivoclar (800) 533-6825
<b>Gov't Cost</b>	\$202.25	\$135	\$135
<b>Retail Cost</b>	\$367.55	\$225	\$350
<b>Curing Method</b>	Dual Cure	Dual Cure	Dual Cure
<b>Number of Shades</b>	5	2	5
<b>Number of Viscosities</b>	2	1	3 (only 2 come in kit)
<b>Radiopaque?</b>	Yes	Yes	Yes
<b>Contains Fluoride?</b>	Yes	No	Yes
<b>Try-in Pastes?</b>	Yes, 5 included	No	Yes, 5 available separately
<b>Filler % (Wt)</b>	62 to 68 (varies by viscosity)	67.5	75
<b>Filler % (Vol)</b>	NA	NA	NA
<b>Average Particle Size</b>	1.3 to 1.5 microns	1.5 microns	1 micron
<b>Bonding Agent Provided?</b>	Yes--Prime & Bond NT	Yes--Single Bond	Yes--Syntac
<b>Silane Provided?</b>	Yes	Yes	Yes
<b>Film Thickness: Company Claim DIS Measurement</b>	11 to 19 microns 18 to 20 microns	13 microns 11 microns	22 microns 23 to 26 microns
<b>Rating by DIS</b>	NA	Acceptable	Acceptable
<b>Report in DIS</b>	Being evaluated	59-13	56-25

As you can see from the table, the cements have some differences with regard to availability of try-in pastes, number of shades, and fluoride content. In general they all can be used for luting the types of

restorations you'd want to cement with a resin cement, including metal, ceramic, porcelain, and resin composite inlays, onlays, crowns, fixed partial dentures, and veneers. Some differences do exist between brands, however. For instance, RelyX ARC can be used for for amalgam bonding as well as for luting "Maryland" bridges and posts but is not recommended for cementing veneers.

All three products appear to have acceptable characteristics for a resin cement and will probably meet your needs. To better determine the "best" product for your clinic, first identify the purpose(s) for which you want a resin cement. Then, review the specific findings included in the DIS evaluations of the products on the CD ROM or on our web site ([www.brooks.af.mil/dis](http://www.brooks.af.mil/dis)). If you need any additional advice or information, please contact DIS.

(Col Charlton)

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## 59-09 Minimizing Bubbles in Investments and Stone

**Question:** How can I eliminate bubbles in my casts and investment? I have perfected my technique and am using the best fine-grain investments and stones. Is there anything else I can do to minimize or eliminate bubbles?

**Answer:** Assuming you have done everything possible to reduce bubbles and your vacuum investor is working properly, there is a rather simple thing you can do. Place the investment ring or poured impression in a dry pressure pot. Bubbles in artificial stones and fine-grain investments show significant reduction in the number and size of bubbles when allowed to set under pressure of 30 psi. Coarse-grain investments require 80 psi or higher to reduce bubbles. Pour some test samples, let them set under pressure, cut them in half, and then compare them to bench set samples. Bego (800) 342-2346 and Lang (800) 222-5264 produce pressure vessels. The Bego Wiropress SL holds up to three impressions and has a maximum pressure of 50 psi. It retails for \$895.00 and has a government price of \$750.00. The Lang Invest-Press holds one impression with a maximum pressure of 160 psi and retails for \$500.00 (government price is \$325.00)

(MSgt Ryerson)

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## 59-10 Captek Alloy System

**Question:** I hear there is a material that you can use to form metal-ceramic substructures without investing or casting. Do you have any information on this material?

**Answer:** Captek is an alloy system that eliminates the need for investing, burning out, and casting normally used to fabricate crown and bridge substructures with traditional metal-ceramic alloys. Captek uses a refractory die and a noble metal-impregnated wax to produce substructures for metal-ceramic restorations. The Captek substructure is made by pressing a gold-platinum-palladium impregnated wax (CAPTEK P) to the refractory die and trimming it at the margins. It is then fired in the porcelain furnace at 1967°F (1075°C) which causes molecular particles to join, creating a three-dimensional network of capillaries. A layer of gold-impregnated wax (CAPTEK G) is then pressed onto the substructure, trimmed at the margins, and fired at the same temperature. The heat treatment draws the "G" layer of gold into the capillaries. (A typical framework is shown in Figure 1.) The manufacturer recommends applying a thin layer of bonding agent called Capbond prior to applying porcelain.



Figure 1. Captek bridge framework

This technology was developed 12 years ago and has been commercially available for the last 10 years.

The manufacturer claims several advantages for it. First, the substructure is purported to be biocompatible and corrosion resistant. Second, it is reported to be extremely strong, so margins can be reduced to a thickness of only 0.1 mm. The manufacturer recommends metal margins be used (see Figure 2 which is a mirror view of a finished Captek restoration showing the circumferential margins). Because the substructure has a gold color and lacks a gray oxide coating, subgingival facial margins



appear esthetic. Interestingly, some research indicates that a "bacterial inhibition zone" is present at the Captek substructure margins.<sup>1</sup> Plaque accumulations have been observed to be reduced by 90% in these areas compared to adjacent natural teeth. The manufacturer also claims that the stress-free construction of Captek substructures make the finished restoration more resistant to impact, load, and fatigue. Finally, the Captek company claims that the budget projections of laboratories using this material are simplified because the material itself is price stable (assuming gold remains less than \$400/Troy ounce).

Naturally, as with any technology, substantial research must be performed to confirm or refute the many advantages claimed for the Captek system by its manufacturer. It should be noted that long-term clinical studies have not yet appeared in refereed journals that evaluate the performance of the Captek system. When they do, clinicians and technicians will be able to assess the value and clinical success of the product.

**Manufacturer/Source:**

Captek, a Division of Precious Chemicals, Ltd.  
2957 SR 434 Suite 100  
Longwood, FL 32779  
(800) 921-2227  
(407) 889-8891  
(407) 889-8893 FAX  
www.captek.com

**Suggested Retail and Government Price:**

\$3,000.00: Captek starter kit includes a one-day training class and enough material to produce 80 to 90 units  
\$500.00: One day training class without purchasing the starter kit  
\$297.00: Refill anterior set for 8 to 12 units  
\$245.00: Refill posterior set for 4 to 8 units

**Reference**

1. Goodson M, Shohert I, Imbert S, Som S. Captek alloy reduces dental plaque accumulation [Abstract]. J Dent Res 1999; 78:262.

(MSgt Ryerson)

# WHAT'S NEW?

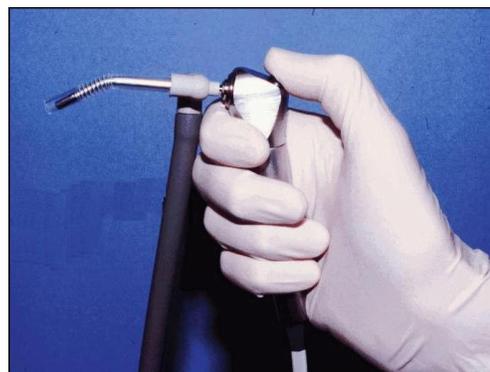
"WHAT'S NEW?" features recently-marketed dental equipment and materials. New and innovative products are marketed each month and DIS is unable to evaluate all of them. This section of the newsletter brings these products to your attention. Because DIS has not had the opportunity to evaluate these products, we cannot confirm manufacturers' claims about them. If you would like additional information about the products or are interested in evaluating them, please contact DIS.

**Tetric Color** is a light-cured tinting and opaquing resin used to characterize direct and indirect resin restorations. The manufacturer, Vivadent, says that the product can be used to characterize standard resin composites, flowable resin composites, and compomers. Tetric Flow is available in seven shades (white, light-yellow, bluish-grey, ochre, medium-brown, dark-brown, and black) that can be used individually or combined to produce other shades. The material has a low-medium viscosity and is packaged in 1-g Luer-Lock syringes with small (0.4-mm) disposable syringe tips that permit precise placement. Instructions suggest the material be placed prior to the final layer of the resin composite restoration to produce the most natural results. The Tetric Color Assortment Kit (item number 6557028) is available from Vivadent (800) 533-6825, (716) 691-0010, (716) 691-2285 FAX, [www.ivoclar.com](http://www.ivoclar.com) for \$122.64 (retail) and \$67.45 (government).



(Col Charlton)

**Vacu-Spray** from Dynamic Dental Innovations is an evacuation system that fits any standard three-way syringe tip. The device provides air, water, and suction together, from one syringe. It is said to be particularly helpful when working without an assistant. The provided suction tip surrounds the air/water syringe and thereby reduces spatter. The standard Vacu-Spray Kit includes 200 disposable Vacu-Spray tips, 6 sterilizable double-elbow connectors, 6 feet of Vacu-Spray tubing, and fittings that adapt to the existing air/water syringe tip. The Vacu-Spray Kit is available for \$99.00 (retail/government); replacement tips cost 8 cents each. For more information, contact Dynamic Dental Innovations at (800) 418-2278 or [www.dynamicdental.com](http://www.dynamicdental.com).



(Col Bartoloni)

**Vacu-Spray EX** is similar to the Vacu-Spray but is one inch longer to allow better access to the posterior region of the oral cavity. The Vacu-Spray EX suction tips fit extended air/water syringe tips provided by the manufacturer. The standard Vacu-Spray Kit and includes 160 disposable Vacu-Spray EX tips, 6 sterilizable double-elbow connectors, 6 sterilizable EX metal air/water syringe tips, 6 feet of Vacu-Spray, and fittings that adapt to the unit. The Vacu-Spray EX Kit is available for \$129.00 (retail/government). For more information, contact Dynamic Dental Innovations at (800) 418-2278 or [www.dynamicdental.com](http://www.dynamicdental.com).

(Col Bartoloni)

**Dentapure DP40** is a dental unit waterline purification cartridge that is used to treat the water provided to a dental unit by its separate water system. The cartridge is installed inside the water reservoir bottle and is connected to the water uptake tube using quick-connect fittings. The device elutes from 2 to 6 parts per million of iodine into the dental waterline which the manufacturer claims reduces the biofilm and meets the American Dental Association quality recommendation for effluent water of less than 200 colony forming units per milliliter. The manufacturer states that the amount of iodine ingested by the patient is less than the minimum adult daily requirement and contains no allergenic proteins. The manufacturer recommends changing the cartridge after it has been used to treat 30 liters of water. Advantages claimed by the manufacturer include minimal installation requirements and elimination of the need for waterline disinfection. The Dentapure DP40 is available from Dentapure (800) 972-3543 for \$79.95 (retail) and \$52.00 (government).

(Col Bartoloni)



**Ultra-Kleen** is a dental unit waterline cleaner that has been specially formulated and clinically proven to clean deposits and control bacterial contamination. Ultra-Kleen is an alkaline peroxide-based product that the manufacturer purports to be safe and non-corrosive for the dental unit. The product, packaged in powder form, is diluted with water and applied to the dental unit water lines once per week for an overnight treatment. The product is available by the carton (20 packets) for \$29.95 (retail/government) or by the case (5 cartons) for \$149.00 (retail) or \$90.00 (government). Ultra-Kleen is available from

the Sterilex Corporation (800) 511-1659 or [www.sterilex.com](http://www.sterilex.com).

(Col Bartoloni)

**D/Sense 2** is a two-bottle desensitizing solution from Centrix, Inc. The company claims that it provides instant relief from dentin hypersensitivity and can be used to treat sensitivity secondary to bleaching, gingival recession, and periodontal surgery. The product is provided in two separate bottles that are applied sequentially. The first contains soluble calcium and strontium salts, and the second contains two soluble potassium salts. Centrix claims that when applied, the two solutions react to form insoluble salts that occlude dentin tubules, which prevents fluid flow and eliminates pain. A potassium salt also forms that is purported to have a depolarizing action which reduces or eliminates pain. D/Sense 2 (item number 310103) is available for \$166.65 (retail) and \$149.95 (government) from Centrix ([www.centrixdental.com](http://www.centrixdental.com)) at (203) 929-5582, (800) 235-5862, (203) 929-6804 FAX.

(Col Charlton)



The **Ultraviolet Water Purifier** is a new offering from DCI International that is purported to purify and warm water for use in dental units. According to DCI, the Ultraviolet Water Purifier is a self-contained system that is compact, can be retrofitted onto most dental units, and eliminates the need to purchase distilled water or refill bottles. Purification is achieved via an ultraviolet bulb suspended inside a steel chamber. An ultraviolet indicator is lighted when power to the purifier is activated and starts a fifteen-minute warm-up period. Following the warm-up period, DCI claims that up to one-half gallon of purified water per minute is available from the unit. The ultraviolet bulb is said to provide over 10,000 hours of use and can be replaced easily without tools. The Ultraviolet Water Purifier features a one-year warranty and is available from DCI International (800) 624-2793 for \$550.00 (retail).

(SSgt Martin)

**Lollicaine™** is a topical 20% Benzocaine anesthetic gel from Centrix, Inc. A box of Lollicaine™ contains 120 peel-packs each with a disposable swab applicator and a single dose of the flavored benzocaine gel. The product can be used to anesthetize soft tissue sites prior to injecting local anesthesia and can be given to patients for treating post-operative pain at home. Centrix claims that Lollicaine™ saves time and enhances infection control because it does away with multi-use bottles of topical anesthetic. The product comes in three flavors: Very Cherry (item #360090), Wonderful Mint (item #360092), and Pina Koolada (item #360094). It is available for \$55.50 (retail) and \$49.95 (government) from Centrix ([www.centrixdental.com](http://www.centrixdental.com)) at (203) 929-5582, (800) 235-5862, (203) 929-6804 FAX.



(Col Charlton)

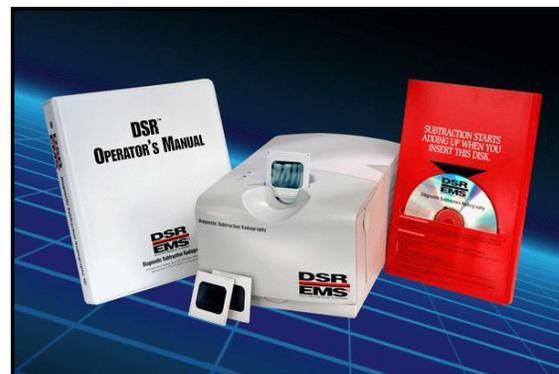
StarDental has recently introduced the **AXCS Sterile Water System**. This system is designed to provide sterile water to a surgical handpiece without a separate infusion pump. The unit connects directly to a spare handpiece tubing already located on the dental unit and does not require electrical connection. It features a flow control valve and fully autoclavable handpiece adapter that connects to standard IV bags and disposable IV tubing. The unit is purported to offer an advantage over gravity-fed delivery systems by pressurizing the IV bag up to 6 psi. The AXCS Sterile Water System is available from StarDental (800) 275-3320 for \$595.00 (retail) and \$309.40 (government).

(SSgt Martin)

The **PerioChip** is a product from Astra Pharmaceuticals that is purported to deliver subgingival sustained-release chlorhexidine for the adjunctive treatment of periodontal disease. PerioChip contains a 2.5-mg dose of chlorhexidine gluconate in a biodegradable mix of hydrolyzed gelatin that is designed to be released over a seven-day period. Each chip is approximately 4 mm x 5 mm in size and the product comes in a blister pack of 10 chips. The manufacturer recommends that PerioChip be stored under refrigerated conditions between 36 and 46 degrees F; its shelf life is 2 years. The PerioChip is available from Astra Pharmaceuticals (800) 225-2787 for \$160.00 (retail) and \$103.91 (government).

(SSgt Martin)

The **DSR Diagnostic Subtraction Radiography System** from EMS is a new software application that is said to offer a new method to monitor disease activity and therapies. The software was designed to assist in analyzing early changes in hard tissue associated with implants, guided tissue regeneration procedures, and periodontal conditions. The manufacturer claims that the software can detect changes in bone density as small as 3%. The DSR System is compatible with both conventional and digital x-rays and runs on any Pentium-based PC with Windows 95/98 or NT Operating System. DSR/EMS is currently offering a free trial CD-ROM to demonstrate the abilities of the Diagnostic Subtraction Radiography System. For pricing information or to receive a copy of the trial CD-ROM, please contact DSR/EMS (800) 640-0377 or (972) 671-4250.



(SSgt Martin)

**Autopuf** is a hands-free air blower for directing dust and fumes out of the breathing zone and into the dust collector. The maximum 30-psi airflow can also be used to cool wax and metal. The airflow is controlled with a variable pressure foot control. The Autopuf can be purchased for \$160.00 (retail) and \$120.00 (government) from Nevin at (800) 544-5337, (773) 624-4330, or (773) 624-7337 FAX.

(MSgt Ryerson)

The **J-Chair** is back. Den-Tal-Ez has recently introduced the successor to the original J-Chair model. Unlike previous models, the new J-Chair features a hydraulic cantilever-style base and a thin chair back. The thin, tapered back is said to allow improved access to the oral cavity. Independently moveable back, seat tilt, and base height adjustments can be activated via a touch pad or foot control. The J-Chair can store up to eight pre-set positions and has an automatic chair lockout to prevent chair movement when a handpiece is engaged. The chair also has a standard 110 volt plug-in that can be integrated with a switch located on the touch pad. The new J-Chair is available from Den-Tal-Ez at (800) 275-7956, (334) 937-6781, or [www.dentalez.com](http://www.dentalez.com) for \$7,295.00 (retail) and \$3,793.40 (government).



(SSgt Martin)



**Flowline** is a light-cured, hybrid, flowable resin composite from the Heraeus Kulzer Company. Among its indications are: Class Vs; small Class I, II, and IIIs; cavity lining in Class I and II restorations; extended pit and fissure sealing; and air abrasion cavity preparations. Flowline is available in nine shades (A1, A2, A3, A3.5, B2, B3, OA2, OA4, and OB2) and can be purchased in syringes or in pre-loaded tips (ie, capsules). Heraeus Kulzer claims that the product is radiopaque, releases fluoride, and exhibits low wear rates and easy polishability. The Flowline Syringe Assortment Kit (item number 4250) contains four syringes (one each of shades A2, A3, B3, OA2) and is

available from Heraeus Kulzer at (219) 291-0661, (800) 343-5336, (219) 291-7248 FAX, or [www.kulzer.com/home.htm](http://www.kulzer.com/home.htm) for \$35.75 (retail) and \$19.35 (government).

(Col Charlton)

**Xantopren® and Optosil® Comfort System** is a two-impresion-material system intended for use in making final impressions. The first product consists of Optosil® Putty for tray fabrication and use in a



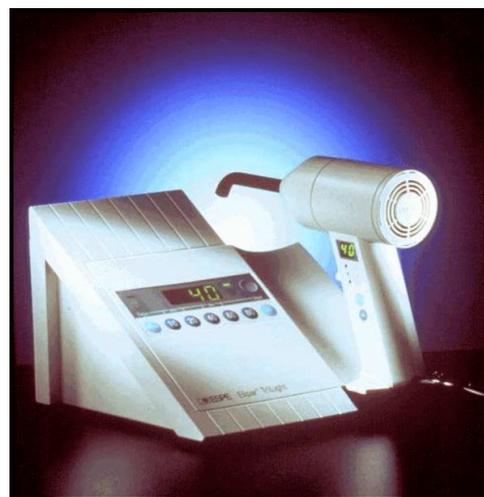
putty/wash technique. The second material, Xantopren®, is provided in medium- and light-body viscosities for use in trays and syringes. Heraeus Kulzer describes the two materials as "significantly modified" condensation silicones that have advantages of both traditional addition silicones and polyethers. The company claims this provides them with several important characteristics. First, the materials are said to be more hydrophilic than standard addition silicones which makes it easier for

them to wet the prepared teeth. They are also said to be resistant to contamination from sulfur commonly found in latex gloves and hemostatic solutions. Lastly, Heraeus Kulzer claims that Xantopren® and Optosil® are just as accurate as addition silicones and exhibit less shrinkage. A Comfort Trial Kit (item number 34002) contains a 50-mL cartridge of Xantopren® Light, a 50-mL cartridge of Xantopren® Medium, mixing tips, intraoral tips, an extruder gun, a 900-mL tub of Optosil® Putty, and a 60-mL tube of Activator for the putty. The product is available for \$119.00 (retail) and \$66.20

(government) from Heraeus Kulzer ([www.kulzer.com/home.htm](http://www.kulzer.com/home.htm)) at (219) 291-066, (800) 343-5336, or (219) 291-7248 FAX.

(Col Charlton)

ESPE America recently introduced the **Elipar® TriLight** curing light. This light is a follow-on to the popular Elipar® Highlight. The TriLight offers three different curing modes: (1) Exponential Mode which automatically increases output intensity from 100 mW/cm<sup>2</sup> to 800 mW/cm<sup>2</sup>, (2) Standard Mode for a consistent high-level output of 800 mW/cm<sup>2</sup>, and (3) Medium Mode for a reduced 450 mW/cm<sup>2</sup> output reportedly for curing near more sensitive areas such as the pulp or gingival tissues. Recent research indicates that “soft-start” or “exponential” curing reduces marginal gap formation without adversely affecting the composite’s physical properties. A 75-watt quartz-halogen bulb generates the light and its internal filter restricts light to the correct spectral range of 400 to 515 nm. The unit has a built-in self-calibration feature to ensure consistent light output. It comes standard with an autoclavable 10-mm-diameter light guide with the availability of 3-mm and 13-mm light rods. The Elipar® TriLight is available through an ESPE America authorized dealer for \$825 (retail), \$552.75 (government). For technical questions, ESPE customer service can be reached at (800) 344-8235.



The Elipar® TriLight is available through an ESPE America authorized dealer for \$825 (retail), \$552.75 (government). For technical questions, ESPE customer service can be reached at (800) 344-8235.

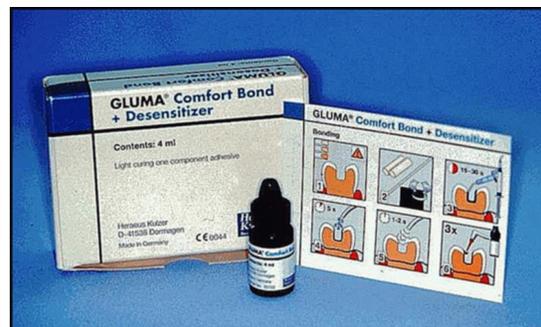
(Col Leonard)

**Dentacide™** is a dental unit waterline cleaner based on free-iodine technology. The product was developed by Biomedical Development Corporation under a grant from the National Institute of Dental and Craniofacial Research. The developer claims that Dentacide™ is non-toxic, non-irritating, non-sensitizing, environmentally friendly, and safe for dental equipment. It has been extensively tested for clinical effectiveness in both private practices and university dental clinics and been found to be a safe and effective solution that improves the microbiological quality of dental waterlines. Dentacide™ is used in conjunction with self-contained water systems, and is a ready-to-use solution that requires no mixing, dilution, or excessive attention to treatment times. Each treatment requires approximately 2 ounces of the solution which are left in the dental unit waterlines overnight. The solution is then flushed at the beginning of the next duty day. Clinical studies show that daily and weekly applications are efficacious, meaning that water from treated dental units meets the American Dental Association’s goal for microbiological quality. In 1999, commercial rights to Dentacide™ were licensed to Frio Technologies at (210) 771-4642 for manufacturing, marketing, and distribution. The product is available by the case (twelve 16-ounce bottles) for \$149.88 (retail/government).



(Col Bartoloni)

**GLUMA® Comfort Bond + Desensitizer** is a one-bottle product intended for bonding and desensitizing. Heraeus Kulzer touts the product as a easy-to-use bonding agent for direct and indirect resin restorations and amalgam bonding combined with the well-known GLUMA desensitizer. The liquid contains 4-META, is alcohol based, and is said to be able to be used with a dry or wet technique. Heraeus Kulzer claims the product’s desensitizing effect comes from its effective



sealing of dentin tubules. Gluma Comfort Bond + Desensitizer is applied in 3 separate coats after acid etching. A 15-second waiting period is then followed by drying with air for 15 seconds and light activation for 20 seconds. As provided to DIS, the product consisted on one 4-mL bottle without the acid etchant. It is available for \$75.80 (retail) and \$43.25 (government) from Heraeus Kulzer ([www.kulzer.com/home.htm](http://www.kulzer.com/home.htm)) at (219) 291-066, (800) 343-5336, or (219) 291-7248 FAX.

(Col Charlton)



**CheckMate** is a powder indicator spray that identifies high spots and contacts when seating fixed and removable restorations. It can also be used for refining occlusion when working on partial denture frames and dentures. CheckMate purportedly marks any restorative surface (porcelain, wax patterns and castings) in either a wet or dry field. It is fast drying, easy to use, and is available in red, green and white. Red is suitable for laboratory castings because it is more reflective. Green does not mix with saliva and stands out in the presence of blood. White is suitable for dentures and pressable ceramics. A 35-g can provides up to 500 applications. The product has a 3-year shelf life and does not contain CFC's. The spray is said to dry instantly and clean up easily with water. Government and retail

price is \$14.75. CheckMate can be purchased from Whip Mix ([www.whipmix.com](http://www.whipmix.com)) at (800) 626-5651, (502) 637-1451, or (502) 634-4512 FAX .

(MSgt Ryerson)

**Model Sep** is an alcohol-based separating agent for stone or plaster that leaves no film and dries instantly. Its clear formula purportedly does not discolor casts and a second pour can be made immediately. It is available in an 8-oz bottle with a fine spray pump. Model Sep can be purchased for \$17.95 (retail) and \$16.95 (government) from Whip Mix ([www.whipmix.com](http://www.whipmix.com)) at (800) 626-5651, (502) 637-1451, or (502) 634-4512 FAX.

(MSgt Ryerson)



**JelDent Multicryl** is a heat-cured/self-cured acrylic resin purportedly suitable for use in both the pour and pack techniques. Multicryl comes as a single powder and two liquid resins (one heat cured, the other cold cured) designed to fill every laboratory need. The five acrylic shades are Light Pink, Light Reddish Pink, 200, Ethnic Moderate, and Ethnic Heavy. One kg of JelDent Multicryl costs \$56.50 (retail) and \$28.25 (government); 500 mL of cold-cure or heat-cure liquid is \$23.00 (retail) and \$11.50 (government). JelDent Multicryl can be purchased from J.F. Jelenko ([www.jelenko.com/mainus.html](http://www.jelenko.com/mainus.html)) at (800) 431-1785, (914) 273-8600, or (708) 371-5103 FAX.

(MSgt Ryerson)



**Prestobalite** is a gypsum-bonded rapid-fire burnout investment for Type I through IV crown and bridge alloys. The investment is very fine-grained reducing air bubbles and making smooth castings. After a 30 minute benchset, place the ring in a preheated oven at a maximum temperature of 650°C/1200°F for a minimum of 30 minutes. The manufacturer purports Prestobalite produces castings that need very little adjustment. A 3-kg package (two 1.5-kg bags) of the product can be purchased for \$25.00 (retail) and \$26.85 (government) from Whip Mix ([www.whipmix.com](http://www.whipmix.com)) at (800) 626-5651, (502) 637-1451, (502) 634-4512 FAX.

(MSgt Ryerson)

The **Optilux 501** is Kerr/Demetron's newest model of curing light. It is a corded visible light-curing unit equipped with an 80-watt quartz-halogen Optibulb and features a built-in digital radiometer. The 501 provides a choice of several curing modes including continuous high-output, ramp, boost, and bleaching modes. The minimum output is reported to be 850 mW/cm<sup>2</sup> and, in the high-output modes, is purported to be in excess of 1000 mW/cm<sup>2</sup>. The ramp mode begins at 100 mW/cm<sup>2</sup> and increases to 1000 mW/cm<sup>2</sup> in the first ten seconds, then during the final ten seconds the output is over 1000 mW/cm<sup>2</sup>. Kerr/Demetron claims that the light's filtering system has been improved to restrict the passage of light to between 400 and 505 nanometers which prevents excess heat transfer to the tooth and restoration. A voltage regulator is standard to maintain constant light output in the event of power fluctuations. Included in the price are two curing tips (the 8-mm Turbo+ and an accessory 11-mm tip) and a protective light shield. The Optilux 501 costs \$1,500.00 (retail) and \$852.15 (government). Further information about this unit is available from Kerr/Demetron ([www.kerrdental.com/Optilux501/index.htm](http://www.kerrdental.com/Optilux501/index.htm)) at (800) 537-7123 or (203) 748-0030.



(Col Leonard)

# ✓ DOUBLE ✓ CHECK

Periodically, DIS presents a round-up of dental products to let you see how we and other evaluation organizations rated them. Ratings will not necessarily correlate between DIS and the other organizations because our mission is to evaluate products from the perspective of military need. Please also note that each organization rates products using its own rating system.

	DIS*	REALITY (out of 5)	CRA (out of 100%)**	DENTAL ADVISOR (out of 5)
RelyX ARC (cement)	Acceptable	4	87%	4.5
Principle (cement)	Acceptable	4	93%	4.5
Temphase (temporary material)	Acceptable	--	73%	--
Ariston pHc (restorative material)	Marginal	2	--	--
Iso-Temp (temporary material)	Acceptable	4	84%	4
Variolink 2 (cement)	Acceptable	4	--	--
The Wand (anesthesia device)	Marginal	--	75%	4
F2000 (compomer)	Acceptable	4	92%	4.5
Solitaire (packable resin)	Marginal	3	--	4.5

\* DIS Ratings: Recommended, Acceptable, Marginal, Unacceptable

\*\* Percentage of evaluators rating the product as "excellent" or "good and worthy of trial."

# FROM THE LITERATURE

Periodically, articles appear in the literature that present clinically useful information or evaluate the performance of a material or piece of equipment. Because DIS believes that this type of research is of value to clinicians, we present a brief description of these articles to make you aware of them. The complete citation is provided so you can obtain the article if you are interested in reading it in its entirety.

## *AMALGAM BONDING AND MICROLEAKAGE*

Effect of bonded amalgam restorations on microleakage. Al-Jazairy YH, Louka AN. Oper Dent 1999;24:203-209.

One of the proposed benefits of using bonding agents as varnish substitutes with amalgam has been a reduction in marginal leakage. The majority of laboratory studies have, in fact, shown at least a short-term benefit in this regard. Most of these studies have been standard microleakage tests using dyes. In this study, the authors used an apparatus that enabled them to measure dentin permeability and, indirectly, microleakage between the amalgam restorations and tooth structure. Class I preparations were made in extracted human molars and the teeth were then separated into four groups. The cavities were treated in one of the following ways: no treatment, Copalite varnish, Amalgambond Plus, or All-Bond 2. The teeth were then restored with Dispersalloy and leakage was measured at 24 hours, 1 week, and at 1, 3, and 6 months. Results indicated that the microleakage was significantly reduced for the Amalgambond Plus and All-Bond 2 groups compared to the No Treatment and Copalite groups. No significant difference was found between the two dentin bonding treatments at any of the time periods. **The study found that the two tested dentin bonding agents significantly reduced the degree of leakage compared to No Treatment and Copalite.**

## *AMALGAM BONDING AND MICROLEAKAGE, ONE MORE TIME*

Quantitative microleakage evaluation around amalgam restorations with different treatments on cavity walls. De Morais PMR, Rodrigues AL, Pimenta LAF. Oper Dent 1999;24:217-222.

Research continues to be performed to assess the ability of various adhesives to reduce the amount of leakage between amalgam and tooth structure. In this short-term study, standardized circular cavities were prepared in the facial root surfaces of 75 extracted single-rooted human teeth. The teeth were divided into five groups of 15 and one of the following treatments was applied to the preparations: No Treatment; Copalite varnish (Cooley & Cooley); Panavia EX resin cement (J. Morita); Scotchbond Multi-Purpose Plus Adhesive (3M); and Photac-Bond (ESPE America), a VLA glass-ionomer liner. After being restored with the admixed amalgam alloy Permite C (Southern Dental Industries), the teeth were stored at 100% humidity and 37°C for 24 hours. They were then thermocycled, exposed to a dye, and sectioned. Leakage was assessed quantitatively using a spectrophotometer and the resultant data were statistically analyzed. Significant differences were found between all groups. The No Treatment group had the most leakage followed, in order, by the Copalite, Panavia EX, Photac Bond, and Scotchbond Multi-Purpose Plus Adhesive groups. **The authors concluded that the adhesive liners significantly reduced the amount of leakage between amalgam and tooth structure.**

## *OCCUPATIONAL HIV INFECTIONS*

Occupational HIV infection in healthcare workers. Molinari JA. Compend Contin Educ Dent 1999;20:882-885.

Healthcare workers are at risk for occupational exposure to the human immunodeficiency virus (HIV) through a percutaneous injury or mucous membrane/skin exposure to HIV-infected blood, tissues or other body fluids during patient treatment. To date, 94 cases worldwide of documented occupational HIV infection in healthcare workers have been reported, including 52 cases in the United States. The most common cause of exposure was percutaneous injuries from hollow-bore needles containing contaminated blood. Other exposures included solid sharps items and mucocutaneous accidents

involving splashes to the eyes and skin. Nurses and clinical lab workers represented a majority of these cases. No dental healthcare personnel have been infected with HIV after accidental exposure to potentially-infected body fluids. Adherence to universal precautions has provided the best measure for safe patient care and prevention of accidental exposures. **This article is an excellent discussion regarding the latest information on occupational HIV infections among healthcare workers.**

### ***FLUORIDE RELEASE FROM GLASS-IONOMER LUTING CEMENTS AND HYBRIDS***

Fluoride release of glass ionomer-based luting cements *in vitro*. Robertello FJ, Coffey JP, Lynde TA, King P. J Prosthet Dent 1999;82:172-176.

Hybrid resin/glass-ionomer cements such as Fuji Plus, RelyX (formerly Vitremer), Advance, and Pro-Tec Cem have some advantages compared to traditional glass-ionomer cements (GICs) like Ketac-Cem and Fuji I. For example, they are stronger, less brittle, less soluble, and less sensitive to moisture contamination. The amount of fluoride they release compared to the traditional GICs continues to be evaluated. In this study, researchers measured the amount of fluoride released daily over a 28-day period from disks made of four cements: the traditional GICs Ketac-Cem and Fuji I and the hybrid products Vitremer and Advance. Results indicated that all four cements released the greatest amount of their fluoride during the first week; this was followed by a gradual decline over the tested period. The order of fluoride release, from greatest to least was Vitremer, Fuji I, Ketac-Cem, and Advance. Not all the differences were statistically significant, however. **The authors concluded that the hybrid resin/glass-ionomer cements exhibited fluoride release that was comparable to or greater than that of the traditional GICs.**

### ***AMALGAM VERSUS RESIN COMPOSITES: WHICH WEAR THE MOST?***

Two-body *in vitro* wear study of some current dental composites and amalgams. Hu X, Marquis PM, Shortall AC. J Prosthet Dent 1999;82:214-220.

It seems that in recent years a consensus has developed that resin composites, when properly placed, exhibit amounts of wear that are roughly equivalent to that of amalgam. Even so, many variables exist that make it difficult to definitively know whether or not this consensus is indeed accurate. As a result, research on this topic continues to be performed. This study was a laboratory evaluation of two-body wear exhibited by two Ultrafine resin composites (P-50, Z100), one microfill (Silux Plus), and three amalgams (Tytin, Tytin FC, Dispersalloy). A device was built that abraded specimens of these materials under varying amounts of load. This was done to simulate the type of loading that occurs during mastication. Results were that P-50 and Z100 exhibited significantly greater amounts of wear than the other materials. Silux Plus exhibited good wear resistance, in fact, it showed less wear than two of the amalgams (Tytin, Tytin FC). Dispersalloy exhibited the least amount of wear of all the materials, although the article is unclear about whether or not it exhibited significantly less wear than all of the tested materials. **The researchers concluded that P-50 and Z100 exhibited more wear than Silux Plus because of their larger filler particles. The difference in wear among the amalgams was thought to be due to differences in their phase distributions.**

### ***GLASS-IONOMER CEMENTS AND WHAT THEY DO TO BUGS***

Antibacterial activity of glass-ionomer restorative cements exposed to cavity-producing microorganisms. Herrera M, Castillo A, Baca P, Carrion P. Oper Dent 1999;24:286-291.

The literature indicates that glass-ionomer cements (GICs) have an antibacterial effect which seems to be due to their low initial pH, fluoride release, and/or content of strontium and zinc. The purpose of this study was to evaluate the antibacterial action of various types of restorative GICs on five complete bacterial groups associated with the development of caries. Four GICs were used: Ketac-Fil, a traditional GIC from ESPE America; Ketac-Silver, a metal-added GIC from ESPE America; Fuji II LC, a resin-modified GIC from GC America; and Vitremer, a resin-modified GIC from 3M. Agar plate diffusion was used for the bacterial cultures and a control group consisting of chlorhexidine was employed. Wells were made in inoculated, agar-containing petri dishes and the tested GIC was placed into them immediately after mixing. The plates were incubated under the appropriate conditions and at 48 hours readings were made of the diameter of the inhibition halos. Results indicated that all four GIC products exhibited antibacterial activity. No significant difference in antibacterial activity was found among chlorhexidine, Vitremer, and Ketac-Fil; both Ketac-Silver and Fuji II LC were significantly less

antibacterial than the chlorhexidine control. **The researchers concluded that the tested GIC products all exhibited antimicrobial activity, to a lesser or greater degree. The effects were not limited to just enamel microorganisms, but also extended to microorganisms associated with caries of the cementum.**

### *LATEX EVERYWHERE*

Latex allergy-a review for the dental professional. Spina AM, Levine HJ. Oral Surg Oral Med Oral Pathol Oral Radiol Endo 1999;87:5-11.

The incidence of latex allergies has been rising steadily since the mid 1980s when the concept of Universal Precautions was introduced by the Centers for Disease Control and Prevention. Clinical studies have shown that healthcare workers have a considerably higher prevalence of latex allergies compared to the general population. Adverse reactions can range from contact dermatitis to life-threatening anaphylaxis. Dental healthcare workers are continually exposed to a variety of latex products during patient treatment. This frequent exposure is responsible for the increased risk of latex sensitization. **This article is an excellent review of the latex manufacturing process, pathophysiology of latex allergy, treatment protocols for the latex-allergic patient, and strategies to accommodate the latex-allergic healthcare worker.**

### *AN AID IN DIAGNOSING ORAL CANCERS*

Improving detection of precancerous and cancerous oral lesions. Sciubba JJ. J Am Dent Assoc 1999;130:1445-1457.

Oropharyngeal carcinoma is a major cause of cancer-related deaths in the United States. In 1999, it is predicted that approximately 30,750 new cases will be diagnosed and 8,440 deaths will occur. Clinical studies show that early detection of oral cancer improves cure rates and patients' quality of life. Visual detection of early oral carcinomas is challenging due to the innocuous appearance and asymptomatic conditions. There is a need for more precise methods of detecting oral cancer in its early stages.

This article reports the results of a study that evaluated the OralCDx (OralScan Laboratories, Inc.), a computer-assisted method for analyzing an oral brush biopsy. OralCDx kits consist of an oral brush biopsy instrument, a precoded glass slide and matching coded test requisition form, an alcohol/polyethylene glycol fixative pouch, and a preaddressed container for specimen shipment. The researchers specifically assessed the technique's sensitivity and specificity in the detection of precancerous and cancerous lesions of the oral mucosa. To accomplish this, a prospective multicenter double-blind study comparing results of OralCDx analysis with conventional scalpel biopsy of suspicious oral lesions was performed.

**The results of this study demonstrate that OralCDx testing was equivalent to a scalpel biopsy as a detection tool. OralCDx testing can be reliably used on oral mucosal lesions with epithelial abnormalities to confirm benign or precancerous/cancerous status. It should be emphasized that OralCDx analysis does not substitute for conventional scalpel biopsy, but identifies oral lesions that require histologic evaluation.**

### *HIGH-SPEED HANDPIECES: HOW DURABLE ARE THEY?*

Performance of high-speed dental handpieces subjected to simulated clinical use and sterilization. Leonard DL, Charlton DG. J Am Dent Assoc 1999;130:1301-1311.

High-speed handpieces are one of the most commonly used pieces of equipment in a modern dental practice. In this study, performance parameters were measured for nine commercially available high-speed air-turbine dental handpieces subjected to 1,000 simulated clinical uses and sterilizations. Ten parameters related to clinical performance (longevity, power, turbine speed, fiberoptic transmission, eccentricity, noise, chuck performance, visibility angle, interocclusal clearance and water coolant spray pattern) were measured at baseline and after 250, 500, 750 and 1,000 use/sterilization cycles. The results indicated that from baseline to 1,000 cycles, the handpieces exhibited greater eccentricity and reduced fiberoptic performance. All models exhibited good water spray patterns and their noise levels were all below the maximum level recommended by the Occupational Safety and Health Administration (OSHA). All provided sufficient power to effectively cut tooth structure and restorative materials. **The**

**authors concluded that no handpiece model is superior to the others in all parameters evaluated. All models evaluated can be expected to perform for at least 500 clinical use/sterilizations, or approximately one year, if properly maintained.**

### *POSSIBLE DRUG TREATMENT FOR BRUXISM*

Antidepressant-induced bruxism successfully treated with gabapentin. Brown ES, Hong SC. J Am Dent Assoc 1999;130:1467-1469.

This case report describes the medical treatment of a depressed patient with venlafaxin, a serotonin and norepinephrine reuptake inhibitor. Although the patient's depression improved, he reported episodes of anxiety, tremor, insomnia, and clenching and bruxism of his teeth during the day and at night. Gabapentin, a drug approved by the Food and Drug Administration for treatment of seizures, was prescribed by the patient's psychiatrist for his anxiety and insomnia. Within one to two days of starting gabapentin therapy, the patient reported that the anxiety, tremors, insomnia, and bruxism had completely resolved. **The authors concluded that gabapentin may be an effective treatment for bruxism if the use of a conventional occlusal mouthguard does not provide relief. They noted, however, that controlled trials with gabapentin need to be performed to substantiate their observation.**

### *CORE MATERIALS: ARE SOME STRONGER THAN OTHERS?*

Diametral and compressive strength of dental core materials. Cho GC, Kaneko LM, Donovan TE, White SN. J Prosthet Dent 1999;82:272-276.

Various properties and characteristics can be used to select a core build-up material. Some include setting and working times, fluoride content, adhesion to tooth structure, color, and curing method. Compressive and tensile strengths, however, are thought to be two of the more important properties because cores usually replace a large bulk of tooth structure and must resist masticatory forces. This study investigated the compressive and diametral tensile strengths of the following eight core materials:

<u>Material</u>	<u>Type</u>	<u>Manufacturer</u>
Ketac Fil	glass-ionomer cement	ESPE America
Ketac Silver	metal-added glass-ionomer cement	ESPE America
Vitremer	resin-modified glass-ionomer cement	3M
Structure	polyurethane	Cadco
Ti Core	titanium-"reinforced" resin composite	EDS
Core Paste	titanium-"reinforced" resin composite	Den-Mat
Herculite	hybrid resin composite	Kerr
Prodigy	hybrid resin composite	Kerr
Valiant	high-copper spherical amalgam	Ivoclar

**Results led the researchers to conclude that compressive and tensile strengths varied widely among the core materials. Some resin composites (Herculite and Prodigy) had compressive strengths equal to that of the amalgam. The hybrid resin composites were stronger than the titanium-"reinforced" composites. The strengths of the glass ionomer-based (Ketac Fil, Ketac Silver, Vitremer) and the polyurethane (Structure) products were significantly lower than the resin composites and amalgam.**

### *REINFORCING CUSPS WITH AMALGAM BONDING*

Cuspal deflection of maxillary premolars restored with bonded amalgam. El-Badrawy WA. Oper Dent 1999;24:337-343.

One of the purported advantages of amalgam bonding is that it reinforces remaining tooth structure and makes it more resistant to fracture. If true, this would help clinicians conserve tooth structure during tooth preparation. In this laboratory study, the author evaluated the effect of amalgam bonding on cuspal deflection in teeth restored with bonded and non-bonded amalgams. After attaching strain gauges to the buccal and lingual cusps of sound, unrestored maxillary premolars, an Instron machine was used to apply a force to the buccal and lingual cuspal inclines. The resulting cuspal deflection was then measured. The teeth were then prepared with a medium-size MOD amalgam preparation, reloaded, and measured. Next, they were restored with an amalgam alloy, stored for 24 hours, reloaded, and measured. The restorations were carefully removed and the teeth reloaded and

measured. Finally, amalgam was again used to restore the teeth after the preparation was treated with All-Bond 2 (Bisco) bonding agent. After 24 hours, the teeth were loaded and strain was measured. The results indicated that there was a marked increase in cuspal deflection following the MOD preparation (compared to the sound, intact tooth). Following restoration with a non-bonded amalgam, the teeth exhibited a small decrease in cuspal deflection. When restored with the bonded amalgam, the cusps exhibited the same degree of deflection measured for the sound teeth. **The author concluded that bonded amalgam restorations significantly decreased outward cuspal deflection of the treated premolars compared to nonbonded amalgam restorations. Bonded amalgam restorations may have a strengthening effect on teeth weakened by extensive cavity preparation.**

#### *FOUR-YEAR CLINICAL PERFORMANCE OF IPS EMPRESS*

IPS Empress inlays and onlays after four years--a clinical study. Krämer N, Frankenberger R, Pelka M, Petschelt A. J Dent 1999;27:325-331.

Ceramic inlays and onlays are becoming more popular as patients increasingly request esthetic alternatives to amalgam. In this study, the authors performed a prospective, controlled, clinical investigation to assess the four-year performance of IPS Empress (Ivoclar) inlays and onlays in cases where cusps were involved and margins were below the enamel-cementum junction. Ninety-six IPS Empress restorations were placed in 34 patients by six clinicians. Four different resin cements (Dual Cement, Variolink Low, Variolink Ultra, and Tetric) were used with Syntac bonding agent (Vivadent) for cementation. Patients were periodically recalled and the restorations evaluated using modified USPHS criteria. Impressions were also made of the teeth and the resulting replicas were examined using scanning electron microscopy to assess wear. Results were that seven restorations had to be replaced over the four-year period (7% failure rate). Four inlays had fractured and three teeth required endodontics. After four years, a significant degree of deterioration was exhibited at the margins of the remaining restorations. Seventy-nine percent of the restorations had marginal deficiencies, regardless of the luting cement. **The authors concluded that the use of higher filler luting resins had not prevented attrition of exposed cement at the margins.**

# GENERAL DENTISTRY

## 59-11 Take 1 Impression Material

(Project 99-12)



Take 1 is a poly(vinyl siloxane) impression material that, according to its manufacturer, features easy wettability, good tear strength, and excellent detail reproduction. The product is available in tubes and in cartridges that are used in an automix gun dispenser. Take 1 comes in two types of Tray material (regular and rigid), a Wash, and a Medium (Monophase). Both Regular-Set and Fast-Set versions of these viscosities can be purchased. The product comes in colors described by Kerr as "bright" for better margin discrimination by the clinician and better patient acceptance. For easy ordering, four configurations of Introductory Kits are currently available. A Tray/Wash Regular Set,

Tray/Wash Fast Set, Medium (Monophase) Regular Set, and Medium (Monophase) Fast Set. This project evaluated the Tray/Wash Regular Set Intro Kit.

### Manufacturer:

Kerr Corporation  
1717 W. Collins Avenue  
Orange, CA 92867-9880  
(800) 537-7123  
(714) 516-7400  
(714) 516-7633 FAX  
[www.kerrdental.com](http://www.kerrdental.com)

### Suggested Retail Price:

\$129.00 Take 1 Introductory Kit -- Tray/Wash Regular Set (item number 29170) contains:  
-four 50-mL cartridges, (2 of Tray and 2 of Wash)  
-automix gun  
-mixing tips

### Government Price:

\$85.50 Take 1 Introductory Kit -- Tray/Wash Regular Set (item number and contents as listed above)

### ADVANTAGES:

- + Working time is long enough to permit unhurried mixing and use.
- + Setting time is appropriate.
- + Users felt the material was helpful when making impressions where complete saliva and hemorrhage control were difficult.
- + Bright colors facilitate reading critical areas of impression.
- + Acceptable odor and taste.
- + Available in three viscosities and two setting times.
- + Meets the detail reproduction requirement of the applicable ISO standard; wash and tray materials should accurately capture fine detail.
- + Meets the requirement for dimensional stability by exhibiting minimal dimensional change over 24

hours.

**DISADVANTAGES:**

- Cartridges require special gun dispenser from Kerr.
- Only one gun dispenser is provided in kit.
- Tray adhesive called for in the instructions is not supplied with the product.
- Small print size on instruction sheet makes it very difficult to read.

**SUMMARY AND CONCLUSIONS:**

Kerr claims that Take 1 is a more hydrophilic impression material than traditional addition silicones. Clinical users confirmed this claim by commenting that it enabled them to make impressions where fluid control was less than desirable. The material's bright colors facilitate the reading of margins and other critical areas of the impressions. Take 1's viscosities and handling characteristics (ie, ease of removal from the mouth, working time, tear strength) were judged to be appropriate by clinical evaluators. Their main complaint was that the Take 1 cartridges require using a special automix dispenser gun. They were also bothered by the fact that the kit contains only one gun which makes it impossible to mix the tray and wash viscosities of the material simultaneously during impression making. **Take 1 Impression Material** is rated **Acceptable** for use by the federal dental services.

(Col Charlton)

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**59-12 GC Fuji Ortho and GC Fuji Ortho LC Orthodontic Cements**

**(Project 97-31)**

GC America markets GC Fuji Ortho and GC Fuji Ortho LC orthodontic cements for the luting of orthodontic brackets and bands. GC Fuji Ortho is a auto-cure resin-modified glass-ionomer cement while GC Fuji Ortho LC is a resin-modified glass-ionomer cement that is cured by visible light activation. The manufacturer claims these products bond chemically to tooth structure and release fluoride. Both products are advertised as bonding to porcelain and metal. The cements' fluoride release is purported to prevent caries formation and protect against "white spot" decalcification marks. Also, both products are said to exhibit low sensitivity to moisture contamination; in fact, GC America claims that the bond to tooth structure improves with moisture. Furthermore, these products are said to be able to bond orthodontic brackets with a non-etch technique. However, both products are purportedly compatible with polyacrylic acid conditioning or with phosphoric acid etching of enamel, if the clinician wishes to use them. Both cements are in powder/liquid form. Fuji Ortho LC is available in bulk form (ie, bottle of powder and bottle of liquid) and in capsules. Fuji Ortho is only sold in bulk form. GC America claims that, after completion of treatment, it is easier to debond orthodontic appliances that have been luted with either of the two cements than it is to debond them if they had been luted with a resin cement. As a result, there is said to be less potential for damaging the enamel during debonding.



**Manufacturer:**

GC America Inc  
3737 West 127<sup>th</sup> Street  
Alsip, IL 60803  
(800) 323-3386  
(708) 597-0900  
(708) 371-5148 FAX  
[www.gcamerica.com](http://www.gcamerica.com)

**Suggested Retail Price:**

- \$99.95 Fuji Ortho LC Starter Kit (Item #439411)
- 15 g of powder
  - 8 g (6.8 mL) of liquid
  - 25 g of GC Ortho Conditioner
  - mixing pad and scoop
  - training video and education packet
- \$195.00 Fuji Ortho LC Standard Package (Item #439403)
- 40 g of powder
  - two 8-g bottles (6.8 mL) of liquid
  - mixing pad and scoop
- \$160.00 Fuji Ortho LC Capsule Package (Item #439450)
- 50 capsules
  - application gun
- \$178.50 Fuji Ortho Introductory Kit (Item #439501)
- 40 g of powder
  - two 8-g bottles (6.8 mL) of liquid
  - mixing pad and scoop
  - training video and education packet
- \$178.50 Fuji Ortho Standard Package (Item #439503)
- 40 g of powder
  - two 8-g (6.8 mL) bottles of liquid
  - mixing pad and scoop

**Government Price:** (Product contents as listed above)

- \$65.00 Fuji Ortho LC Starter Kit (Item #439411)
- \$87.75 Fuji Ortho LC Standard Package (Item #439403)
- \$57.60 Fuji Ortho LC Capsule Package (Item #439450)
- \$76.50 Fuji Ortho Introductory Kit (Item # 439501)
- \$76.50 Fuji Ortho Standard Package (Item #439503)

**ADVANTAGES:**

- + Provides adequate bond strength for typical orthodontic use.
- + No enamel etching required before bonding.
- + Provides adequate bonding of orthodontic appliances in situations where moisture cannot be adequately controlled.
- + Releases fluoride.
- + No caries or decalcification "white spot" formation noted during this evaluation.
- + Easy to remove appliances and clean up residual cement.
- + Easy to integrate with existing orthodontic resin composite bonding technique.
- + Written instructions are readable with adequate amount of detail and technique description.
- + Educational video in Introductory Kit; easy to understand with excellent technique description.
- + Excellent packaging configuration.
- + Metal application gun makes it easier to place precapsulated cement material.

**DISADVANTAGES:**

- Initial viscosity may allow some bracket "creep."
- Greater incidence of bracket debonding when used with a no-etch, no-conditioning technique.

**SUMMARY AND CONCLUSIONS:**

GC Fuji Ortho and GC Fuji Ortho LC are resin-modified glass-ionomer orthodontic luting cements that

offer conventional auto-cure and visible light-cure capabilities as well as the flexibility of hand-mixed and precapsulated delivery systems. Clinical evaluators found these materials to be simple to use and easy to integrate into their existing clinical technique. The products appeared to provide acceptable clinical bond strength. Users found that the GC Fuji Ortho cements bonded to tooth structure without acid etching or conditioning, but a debonding rate of three percent was reported during this evaluation when no etching or conditioning was done. The cements provided good bonding in moist environments, were easy to clean up, and did not facilitate the development of any caries or "white-spot" decalcification lesions. Clinical users found the initial viscosity allowed some initial "bracket creep." The **GC Fuji Ortho Cements** are rated **Acceptable** for use by the federal dental services.

(Lt Col Roberts)

### 59-13 RelyX ARC Adhesive Resin Cement

(Project 99-11)



RelyX ARC Adhesive Resin Cement is a dual-cured, two-paste, permanent luting agent marketed by the 3M Company. The cement is filled to 67.5 percent by weight with zirconia/silica particles having an average size of 1.5 microns. Two shades, Transparent (A1) and Universal (A3), are available. The dispensing system for RelyX ARC consists of an innovative "clicker." The clicker is a plastic, finger-activated device that dispenses equal amounts of the base and catalyst pastes, which are then mixed by hand. When used with Single Bond fifth-generation dentin bonding agent, which is supplied with the cement, RelyX

ARC is recommended for the cementation of indirect restorations such as crowns, bridges, inlays, onlays, "Maryland" bridges, and endodontic posts. The restorations may be made of porcelain, ceramic, precured resin, or metal. RelyX ARC is also recommended by 3M for amalgam bonding. Silane solution and illustrated technique cards are also provided.

#### Manufacturer:

3M  
 Dental Products Division  
 3M Health Care  
 3M Center, Bldg 275-2SE-03  
 St. Paul, MN 55144-1000  
 (800) 237-1650  
 (612) 733-8524  
 (800) 888-3132 FAX  
[www.mmm.com/dental/](http://www.mmm.com/dental/)

#### Suggested Retail Price:

\$225.00 RelyX ARC Introductory Kit (product number 3415)  
 -one 4.5-g paste, shade Transparent (A1)  
 -one 4.5-g paste, shade Universal (A3)  
 -one 6-mL bottle of Single Bond Adhesive  
 -one 5-mL bottle of 3M RelyX Ceramic Primer  
 -two 3-mL syringes of phosphoric acid etchant  
 -accessories  
 -illustrated technique cards

**Government Price:**

\$135.00 RelyX ARC Introductory Kit (product number and contents as listed above)

**ADVANTAGES:**

- + Very low thin film thickness (11 microns).
- + Adequately radiopaque.
- + Working time is long enough so users do not have to rush during mixing and placement.
- + Relatively short setting time minimizes post-cementation chair time.
- + "Clicker" device worked well at dispensing equal amounts of the base and catalyst pastes.
- + Pastes are easy to mix.
- + Has appropriate viscosity.
- + Easy to clean excess cement from margins.
- + Shades were adequate for majority of cases treated during evaluation.
- + Graphics-containing instruction cards were very helpful.
- + Expiration dates and lot numbers are provided for all items in kit.
- + Supplied with silane solution and a fast, easy-to-use bonding agent.

**DISADVANTAGES:**

- Not intended for use in luting porcelain veneers.
- Material Safety Data Sheet (MSDS) not shipped in kit.

**SUMMARY AND CONCLUSIONS:**

Laboratory testing showed that RelyX ARC Adhesive Resin Cement has a very thin film thickness, appropriate working and setting times, and is adequately radiopaque. Clinical evaluators found it easy to use and judged its innovative "clicker" dispenser to be very handy. RelyX ARC has a wide range of uses, including amalgam bonding, but is not recommended for the commonly performed procedure of luting porcelain veneers. 3M recommends another of their products, Opal Luting Composite, for that purpose. This is an important limitation because other popular resin cements such as Nexus (Kerr) and Variolink 2 (Ivoclar) provide this capability at the same price or a lower price than that of RelyX ARC. Users gave the cement high marks for its ease of mixing and viscosity. Even though it comes in only 2 shades, they were sufficient for most clinical cases encountered during the evaluation. **RelyX ARC Adhesive Resin Cement** is rated **Acceptable** for use by the federal dental services.

(Col Charlton)

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**59-14 Triturator Synopsis****(Project 99-29)**

Triturators are common, indispensable pieces of equipment in dental practice. One reason is because many practitioners prefer precapsulated dental materials over hand-mixed equivalents since they provide more efficient and consistent mixing.

DIS was able to obtain data for eight different triturators/mixers from six manufacturers who replied to a DIS request for information. Analysis of this supplied information reveals that federal facilities have many choices of triturators that should fit any requirements that local facilities may have. This information has been summarized in Attachments 1 and 2 to assist federal dental facilities in making choices when purchasing triturators.

(Lt Col Roberts)

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**59-15 Pentamix 2 Cybernetic Impression Material Mixing System****(Project 99-16)**

The Pentamix 2 is an electrically-powered machine for mixing and dispensing impression materials.