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ADMINISTRATION

61-01 3M Dental and ESPE to Combine

In early October 2000 , the 3M company announced it had entered into an agreement to combine its Dental Products Division with ESPE Dental AG, a Germany-based developer and manufacturer of products for the dental profession. Terms of the transaction were not disclosed, and both companies noted that completion of the transaction was contingent on regulatory approvals. It was reported that the combined businesses would operate globally as 3M ESPE, a division of 3M Health Care Markets. 3M has been in the dental business for over 35 years, and is well known as a manufacturer of abrasives, adhesives and ceramics. Currently, 3M manufactures and markets more than 1,300 products used by dentists worldwide. ESPE has been in the dental business for over 50 years, and has demonstrated a tradition of strong research and development. ESPE Dental AG is best known for its Ketac brand of glass-ionomer cements. Both companies announced they are committed to a smooth transition for their customers, distributors and employees, and have given assurances of continued product service and support.

(Col Charlton)

61-02 The Purpose of the DIS Rating System

As many of the regular readers of *Dental Items of Significance* know, the Dental Investigation Service (DIS) assigns one of four ratings to products after we have evaluated them. The ratings, "Recommended," "Acceptable," "Marginal," and "Unacceptable" each have specific definitions which can be found at www.brooks.af.mil/dis/ratings.htm. Periodically, we receive calls from individuals who express confusion about these ratings and how they impact a dental clinic s freedom to purchase a product. Some people believe, for example, that they **must** purchase only "Recommended" products and are prohibited from buying those that are rated "Acceptable" or "Marginal." In fact, the DIS ratings are intended to be a guide for clinic personnel, to make it easier for you as the Logistics NCOIC or OIC to reach an informed decision about what product may best suit your needs. In no way does DIS wish to dictate what clinics can purchase. However, one restriction is imposed by the "Unacceptable" rating: Air Force Instruction (AFI) 47-1 prohibits USAF clinics from purchasing products that have been rated "Unacceptable." This is because the "Unacceptable" rating is reserved for products that fail to perform their essential functions, are of poor quality, and/or may be unsafe to use. One other point: clinics are not precluded from purchasing products just because DIS hasn t evaluated them. There are many products that DIS simply doesn t have the time and/or resources to evaluate. For those products, you may want to check with other evaluation organizations such as Clinical Research Associates (CRA) or Reality, to find out how they rated them. If you have any questions about the intended purpose of the DIS ratings or what they mean, please contact us.

(Col Charlton)

61-03 Dentsply Announces Intention to Acquire Pro-Dex

Dentsply International, the world s largest dental manufacturer, has announced its intention to acquire all issued and outstanding shares of the Colorado-based holding company, Pro-Dex. Pro-Dex consists of four manufacturing and distribution-based businesses, three of which produce products used by dental health care providers. The companies are: Micro Motors, which, among other products, manufactures handpieces; Biotrol International, a company that produces preventive dental care and infection control products; and Challenge Products Inc., which makes a complete line of fluorides, prophy pastes, and tooth whiteners. The transaction is expected to be completed in the first quarter of 2001 assuming

approval by federal regulators, Dentsply s board of directors, and Pro-Dex s shareholders.

(Col Charlton)

61-04 Update Regarding Dental Laboratory Casting Machines

At DIS we occasionally receive calls asking about the need to either provide a lid for traditional laboratory casting machines or to purchase an alternative design. A review of the history of this issue will help provide an answer. In May of 1994, a Michigan Occupational Safety and Health Administration (MIOSHA) inspection of a dental equipment manufacturing plant resulted in various citations, one of which concerned the dental casting machines in the laboratory. The inspector determined that the casting machines mounted in the lab did not meet MIOSHA Standard R 408.10034 (11) which states, "An extractor, parts washer, or tumbler, manually controlled and equipped with an inside revolving cylinder, shall be equipped with a cover or door interlocked in such a manner as to prevent opening the door when the inside cylinder is in motion, and to prevent power operation of the inside cylinder when the cover or door is open. An inch control or constant pressure control which bypasses the interlock may be used to aid loading and unloading." This raised the obvious question: Are traditional centrifugal dental casting machines mounted in laboratories throughout the country in violation of OSHA safety standards? In an attempt to answer this question, the National Board for Certification of Dental Laboratories (NBCDL), an administratively independent trust under the National Association of Dental Laboratories (NADL), retained the services of an engineering consultant. The consultant performed an extensive analysis of the casting process and requested from OSHA an interpretation of machine guarding requirements in relation to dental casting machines. The request for interpretation was in relation to OSHA Standard 29 CFR 1910.212 (a)(1), a close corollary to the MIOSHA standard originally cited. OSHA never responded to his request or to a follow-up request. The consultant's professional opinion, which he provided to the NBCDL, was that casting machines as traditionally mounted in dental laboratories are not in violation of OSHA Standard 29 CFR 1910.212(a)(1). Further information regarding this interpretation can be found on the NADL's web site at www.nadl.org/html/does_osha_require_an_interlocking_cover_.html.

DIS recommends that until definitive guidance is provided by OSHA, USAF dental facilities continue using traditional casting machines. Clinics should continue to document safety training regarding the use of these machines and post a highly visible sign near the machine giving a warning to the effect, "Casting Machine: For Use by Authorized Personnel Only."

(Col Browning)

61-05 Results of Miele Dental Thermal Disinfector G 7781 Survey

A significant aspect of proper infection control is the protection of healthcare workers from occupational exposure to bloodborne pathogens. This includes identifying the safest methods for decontaminating instruments prior to sterilization. To this end, automated instrument washers have become an integral component of central instrument processing in most USAF dental clinics. They enable sterilization technicians to safely handle instruments by reducing the incidence of percutaneous injuries.

The Miele Dental Thermal Disinfector G 7781 is a dental instrument washer that cleans and thermally disinfects dental instruments and accessories. The unit is equipped with the following standard features: electronic controls, water softener, automatic dosage system, and steam condenser. The system has a tuberculocidal effect because it heats water to a temperature of 93C (200F) and maintains it for 10 minutes. The Miele can be used as a free-standing unit or, where appropriate, can be placed under a counter top. DIS completed an evaluation of the Miele G 7781 (see *Dental Items of Significance* 47-38), and the product was given a "Recommended" rating. The major advantages noted during the evaluation were its safety, convenience, cleaning efficiency, and cost-effectiveness.

DIS recently conducted a survey to update information gathered from a previous survey (1998) that was published in May 1999 (see *Dental Items of Significance* 57-02). The 1998 survey was done because of

several reports of reliability, repair, and customer service problems with the Miele G 7781. The survey identified the following problems: water leaks, circuit board failures, faulty circulation pumps, and inadequate customer support. In September 2000, a follow-up survey was sent to all USAF dental facilities (n=88) to determine if these problems had been corrected and if the manufacturer had improved customer service. The results are given below:

Number of Miele Units Covered by Survey: 67
Number of Years Units were in Use:
- 3 or more: 57/67 (85%)
- 2 or less: 10/67 (15%)

Percentage of Units with Reported Problems: 78%
Percentage of Repaired Units Requiring Downtime for Repairs: 92%
Range of Downtime Required for Repairs: 1 day to 6 months
Most Frequently-Cited Problems:
- Leaks - 36%
- Circulation Pumps - 32%
- Electronic Circuit Board - 32%

Repairs were made by:
- Biomedical Equipment Technician: 64%
- Contractor: 19%
- Patterson Dental: 14%

Was timely and adequate service provided by Patterson Dental?
- Yes: 75%
- No: 25%

Was timely and adequate service provided by Miele?
- Yes: 63%
- No: 37%

SUMMARY AND CONCLUSIONS:
Since the 1998 survey, ten units have been placed in service. Of these, eight units have required no repairs. The two units requiring repairs were minor in nature and required minimal down time. The markedly better performance of the more recently installed units may simply be due to the fact that they have been in service for a shorter time than the more problematic units. **DIS recommends that if your military dental facility plans to purchase a Miele G 7781 in the future, you should contact Col Bartoloni (DSN 792-7676) for pertinent facts about its use and operation.** At this time there is no comparable alternative to the Miele G 7781, but DIS will continue to investigate other options as they become available. Miele has improved customer support by developing a training video for users. **The company also now has a designated point of contact who handles consumer problems. Military dental clinics experiencing problems with the Miele G 7781 should contact John Lubas at (800) 421-4685 (ext 302) or (609) 419-9898 (ext 302).**

(Col Bartoloni)

61-06 Pertinent Information on Waste Disposal and Dental Amalgam

The Naval Dental Research Institute s (NDRI) most recently published issue (Volume 2, Number 2) of *Scientific Review of Issues Impacting Dentistry* discusses an important topic for all federal dental services, "Solid Waste Disposal Issues and Dental Amalgam." The article provides a brief discussion of development of the current legislation that governs proper disposal of hazardous waste. Previous research done by the NDRI measuring residual mercury levels in used amalgam capsules is discussed as is work by the Dental Investigation Service on leakage of mercury from capsules before and during trituration. Finally, recommendations for the appropriate use and handling of dental amalgam previously published by the American Dental Association are listed, and several additional sources of information on mercury hygiene are identified. The article can is available here in PDF format.

(Col Charlton)

61-07 Hazard Communication (HazCom) Web Briefing (Project 00-40)

DIS currently has several Powerpoint briefings on the DIS web site that have been produced to provide teaching resources to federal dental clinics in meeting yearly mandatory training requirements. A Hazard Communication (HazCom) briefing has recently been prepared to assist local facilities in training personnel about the Occupational Safety and Health Administration s Hazard Communication Standard and the potential hazards of chemicals in the workplace. The 38-slide presentation can be downloaded from the Download page of the web site.

(Col Bartoloni)

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 questions about electrical surgical handpieces, proper use of cements, and Amalgam bond. 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 792-7676.

61-08 Technique Sensitivity and Dentin Bonding Products

Question: Most of the lecturers I've heard talk about bonding products say you should follow the manufacturers directions. Is there any real proof that making minor mistakes like over etching the tooth or overdrying the bonding agent has an adverse effect on their performance?

Answer: You are quite correct about the fact that most informed lecturers make a point of underscoring how important it is to follow the manufacturer's instructions when placing a particular bonding product. Sometimes, although the recommendation to follow the manufacturer's instructions sounds reasonable enough, it can be a different matter to do so in a clinical situation. First of all, manufacturers have traditionally not been very helpful in the design of their instructions. Until the last few years, instructions often came in multi-language booklets and were printed in small font sizes that made it very difficult to read them. Also, they were laid out in a format that make it challenging to find the particular instructions you needed for a specific clinical procedure. Fortunately, over the years manufacturers have been responsive to complaints they have received about the user-unfriendliness of their instructions. Now,, although they still provide detailed instructions, most also include summary instruction cards that contain graphics to help make it easier to use them correctly. One of the first companies to do this was Bisco with the All-Bond line of products. Many companies soon followed suit, some by introducing the concept of color-coded cards keyed to particular components of their kits (e.g., OptiBond, Sybron/Kerr) and cards that were mostly graphics (see figure of card included with Gluma One Bond, Heraeus Kulzer). These innovations have made it much easier to follow the directions. Even when the instructions are provided in a user-friendly manner, it can often be difficult to apply products as directed simply because of patient management problems. The bottom line is that it can be tough to follow directions to the letter.

Although we know it is important to read and follow the instructions, until recently it has been difficult to back up this recommendation with scientific evidence. However, an article recently published in the *Operative Dentistry Journal* has shown how important it is to follow directions. In this study (Frankenberger et al, Oper Dent 2000;25:324-330), simulated application mistakes were made when using three popular bonding products to bond resin composite to extracted human teeth. Some of the errors included prolonged etching of tooth structure, excessive drying after etching, drying the primers immediately after placement, and excessive drying of the primers. Bond strength and marginal integrity were assessed for the bonding agents (Syntac Classic, Vivadent; Scotchbond Multi-Purpose Plus, 3M; Prime & Bond 2.1, Dentsply/Caulk) as measures of their performance. Results indicated that application errors caused dramatic decreases in the adhesives performance for all three products. Clearly then, it is important to apply bonding agents as directed. Specifically, they should be placed for the recommended amount of time, dried or not dried as instructed, and light activated for the correct length of time using an adequately intense light source.

(Col Charlton)

61-09 Electric versus Air-Driven Surgical Handpieces

Question: Our current surgical handpieces are nearing the end of their projected life cycle and we want to replace them. It seems that many USAF facilities are now using electric surgical handpieces. I have heard rumors that the electrical handpieces have had some problems. Can we still purchase air-driven surgical handpieces or is it recommended that we buy electric ones?

Answer: Air-driven surgical handpieces are still dependable workhorses in many USAF dental clinics. They provide excellent torque, usually have low maintenance requirements, and can be easily sterilized. A disadvantage with them, however, is that some providers find them to be noisy. Also, they require access to a central nitrogen source or a mobile nitrogen tank. Because of these drawbacks, some clinics have purchased electric surgical handpieces. They are quiet, portable, do not require a bulky handpiece air hose, and do not require access to a compressed air source. One disadvantage of electric surgical handpieces is that they do not seem to hold up autoclave sterilization as well as their air-driven counterparts. This may be contributing to the reports DIS occasionally receives about electric surgical handpieces breaking down more frequently than air-driven ones. An important thing that should be kept in mind when choosing an electric surgical handpiece is that it must be returned periodically to the manufacturer for maintenance. The meaning of "periodically" can vary from manufacturer to manufacturer, so before you purchase a specific brand of electric surgical handpiece, it is important to ask the manufacturer how frequently they recommend maintenance. Consultation with Col Wendell Edgin, Oral and Maxillofacial Surgery Consultant to the USAF Assistant Surgeon General for Dental Services, indicates that there is no central guidance concerning the purchase of surgical handpieces. In other words, local dental facilities can purchase whichever handpiece system they desire based on user preferences. Wilford Hall Medical Center still uses air-driven surgical handpieces due to their dependability and ability to withstand sterilization. Of course, it is always a good idea to know the advantages of disadvantages of each type of handpiece prior to making a procurement choice. For information on specific brands of electric surgical handpieces, please refer to *DIS* 50-31 or call DIS.

(Lt Col Roberts)

61-10 Dispense No Cement Before its Time

Question: Once in a while I use a cement that I have to hand mix because it doesn t come in capsules. Sometimes, my assistant puts the powder and liquid on the glass slab before she is ready to mix it. I remember being told that isn t a good thing to do, but I don t remember why. And, any way, does it really have any bad effects?

Answer: Although the majority of information provided at lectures or courses is solidly backed by research-based evidence, some instructions or guidance stems simply from tradition. Whenever a recommendation is made to mix or use a dental material a certain way, it is important to know if there indeed is a basis in fact for the recommendation. The specific recommendation you ask about is that cement liquids be dispensed only immediately before mixing and not at the beginning of the appointment just because it might be convenient at that time to do so. What exactly is the rationale for this? Well, the reasoning is that if you dispense the liquid and it is water-based, as many cement liquids are, the water will begin to evaporate. This can change the water/acid ratio and produce adverse effects on the cement s final properties. For the same reason we are cautioned against leaving the bottle of liquid uncapped for extended periods. Now, the important question: what is the evidence that this can actually happen? Although we have seen previous research that indicates that changes in the liquid can affect cement properties[1], a recently published article has evaluated the effects of these changes on newer brands of water-containing cements. Hondrum[2] studied how evaporation of the liquid affected the a number of physical properties of four water-containing cements (Hy-Bond Zinc Phosphate, a zinc phosphate cement; Hy-Bond PCA, a zinc polycarboxylate cement; Glaslonomer, a glass-ionomer cement; and Advance, a resin-modified glass-ionomer cement). He found that the cements properties changed when the cement liquids were dispensed early and began to evaporate prior to mixing. Specifically, he saw that pH

decreased, viscosity (i.e., thickness) increased, and film thickness increased. These could be clinically important changes because they may result in adverse effects on the pulp as well as incomplete seating and decreased retention of the restoration. Interestingly, the zinc polycarboxylate cement (Hy-Bond PCA) and the glass-ionomer cement (GlasIonomer) showed greater changes than the zinc phosphate cement (Hy-Bond Zinc Phosphate) and the resin-modified glass-ionomer cement (Advance). The effects on other properties that Hondrum measured varied depending on the type of cement and the amount of liquid allowed to evaporate before mixing.

So, as you can see by this research, there are important reasons to avoid allowing cement liquid to evaporate. There are a couple of easy ways to do this. First, don't allow your assistant to dispense the cement until just before you are ready to have him/her begin mixing. A second way is to ensure that the assistant recaps the bottle of liquid immediately after dispensing, because evaporation can occur from the bottle even though the orifice is small. Some researchers have suggested that improving the way the liquid is packaged may also reduce evaporation. For example, one way might be to provide the liquid in a syringe rather than a bottle. This, of course, is out of our control, however we can do the simple things already mentioned to minimize the effects that changes in liquid content can have on the cements we use so frequently in dentistry.

(Col Charlton)

References
1. Norman RD, Swartz ML, Phillips RW, Sears CR. Properties of cements mixed from liquids with altered water content. J Prosthet Dent 1970;24:410-418.
2. Hondrum SO. Effects of evaporation on the properties of water-based dental luting agents. Gen Dent 2000;48:286-290.

61-11 What Does that Funny Mark Mean?

Question: I noticed that many of the composite resins and bonding agents we use in our clinic have a marking on their box that looks like a "CE." What does it mean?

Answer: Since January, 1996, the CE Mark (which stands for Conformite Europeene) has been required on certain goods sold into the European market. The mark was established by the European Commission as an indication that the product conforms to legal requirements of European Union health, environmental, or safety directives. Many of the directives mandate a certain level of quality. You can think of the mark as a kind of passport that permits manufacturers to freely circulate their products throughout the European marketplace. The basic purpose of establishing the mark was to eliminate barriers to trade in Europe that arose because of the many restrictions put into effect by the various countries. A myriad of products can bear the CE mark, from children's toys to computers. Although CE Mark applies only to products covered by certain kinds of directives or regulations, it covers nearly 50% of the goods exported to Europe from the United States.

(Col Charlton)

61-12 Latest Developments in Adhesive Dentistry

Question: At a meeting I attended last week, one speaker spent a lot of time talking about self-etching dentin bonding agents. I thought those were old hat. Is there something new about them I m missing?

Answer: One of the latest developments in adhesive dentistry has been the introduction of self-etching bonding agents. Instead of the traditional three-step products that separately etch the dentin, prime it, and bond to it, the self-etching primer products are provided as two-part or two-step systems. They consist of a self-etching primer (also known as an acidified primer) and a separate adhesive resin. The acidified primer does the job of both the etchant and primer of the three-part products. No separate acid-etching step for the dentin is required. (It is important to note that some of these products require separate acid

etching of uncut enamel.) Usually, the products are simpler and faster to apply than three-part systems because they require fewer steps. The acidified primers, for example, are applied to the smear layer-covered dentin (and cut enamel), allowed to remain for a short period of time, and are not rinsed off. There is some discussion in the dental materials community about the wisdom of allowing the treated smear layer to remain after etching, but the products seem to perform well and achieve strong bonds to dentin. One advantage that manufacturers of some of these self-etching primer products claim is that they dramatically reduce post-treatment sensitivity because they etch and prime simultaneously. As they do, the entire depth of demineralized dentin is infiltrated with resin and well sealed. Examples of self-etching primer products include Clearfil Liner Bond 2V (Kuraray) and Clearfil SE Bond (Kuraray). Other more recently introduced products that feature a self-etching primer are ESPE America's Prompt L-Pop and J. Morita's One-Up Bond F. These two are actually even simpler to apply than other self-etching primer products because they are one-step or one-component products. ESPE America and J. Morita claim they etch, prime, and bond all in one step. Although one-step products would be a significant advance in adhesive dentistry, DIS recently evaluated Prompt L-Pop and found it had several important shortcomings (see *DIS* 61-20). An evaluation of One-Up Bond F is underway. As new innovations are made in adhesive dentistry, DIS will keep you informed.

(Col Charlton)

61-13 Everchanging Names of Products

Question: I am really becoming confused about the names of certain products? It s irritating because it seems like once I figure out which product it is I like, the company changes the name. Why?

Answer: You are certainly correct about the frequency with which the brand names of dental materials can change. Here are a few examples: Vitrabond (3M) was changed to Vitrebond, Fuji Duet Cement (GC America) was changed to Fuji Plus, and Vitremer Luting Cement (3M) was changed to RelyX. Some changes are made for legal reasons, while others occur in order to associate a product with a larger product line. While some names change completely, others are only modified, which can also cause confusion. For example, Dyract was changed Dyract AP, Compoglass to Compoglass F, Photac-Fil to Photac-Fil Quick, and Fuji II LC to Fuji II LC Improved. Most often these changes are made to indicate a purported improvement that the manufacturer has made to the original version of the product. The bottom line is that too many products have names that are too similar and the frequency with which product names are modified or completely changed adds to the confusion. There isn t a lot that we as individuals can do to prevent name changes other than let the manufacturers know that the practice can cause confusion.

The hybrid resin/glass-ionomer products represent some of the most rapidly materials in dentistry, so they seem to be prone to name changes. The following table contains a current list of some popular products from the major manufacturers. Manufacturers and products are hyperlinked to their respective web pages.

Type/Brands of Resin-Modified Glass Ionomers

Manufacturer	Luting Cements	Restorative	Liner/Base
GC America	Fuji Plus	Fuji II LC Improved	Fuji Lining LC
3M	RelyX	Vitremer	Vitrebond
ESPE America		Photac-Fil Quick	Photac Bond
Vivadent	ProTec Cem		

(Col Charlton)

61-14 Proper Handling of Amalgambond

Question: Yesterday, I had a very unexpected thing happen while I was treating a patient using Amalgambond. My assistant had mixed the base and catalyst and was using a cotton roll to clean up some leftover liquid. He placed the cotton roll on a patient napkin where it began to smolder and then flame. I had never heard of something like that. The flame wasn t large and it went out pretty quickly, but I d like to know if this is specific to Amalgambond or can other bonding products cause this?

Answer: Amalgambond is the only bonding product that exhibits this behavior. It has been known for some time that the catalyst of Amalgambond (and Amalgambond Plus), tri-n-butyl borane, can cause paper to smolder if it is applied to it. On Parkell s web site (www.parkell.com/msds/s371.asp), the Material Safety Data Sheet (MSDS) for the catalyst notes that it is a relatively unstable, volatile liquid that can "(g)enerate heat when exposed in the air and may cause spontaneous combustion of cotton, gauze or other flammable materials." For that reason, Parkell provides guidance for properly handling the catalyst. If you spill some of the catalyst or have mixed base and catalyst to clean up, use a slightly damp cloth towel. Do not use a dry piece of gauze, paper, or cotton and never discard the cloth towel or towelette in a trash receptacle. Immediately after wiping up the liquid, you should run the cloth under running water, wring it out, and then let it dry in the open. Other measures for avoiding this problem include mixing the base and catalyst immediately before use, cleaning up any excess catalyst and base as soon as possible, and never leaving the catalyst syringe uncovered.

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.

The Astralis 7 Polymerization Light is a new 75-watt quartz-halogen visible light unit recently introduced by Vivadent. The light offers three different curing modes: (1) Low Power of 400 mW/cm^2 for polymerizing materials close to the pulp (2) High Power of 750 mW/cm^2 for curing through tooth structure or overlying restorative material, and for bulk placement of materials, and (3) Pulse Program which ramps from 150 mW/cm^2 to 400 mW/cm^2 over a 15-second period and then, for 25 seconds, pulses between 400 mW/cm^2 and 750 mW/cm^2 every two seconds. Vivadent claims that these various modes provide the user with a unit that is capable of effectively curing materials while limiting the development of heat and shrinkage stress. The light is programmed with software that purportedly regulates line voltage and current which produces continuous light intensity for the life of the unit. If the light deviates in intensity, an indication is given in the liquid crystal display located on the gun handle. The unit comes standard with a 10-mm-diameter light guide, and other sizes of guides can be purchased separately. The Astralis 7 is available for $690 (retail) and $425 (government) from Vivadent at (800) 533-6825, (716) 691-0010, (716) 691-2285 FAX, or www.ivoclarna.com.

(Col Charlton)

VivaStyle® is a professionally dispensed home bleaching product from Vivadent. The carbamide peroxide, mint-flavored gel is available in 10% and 16% concentrations is packaged in 1.3-g unit-dose syringes. According to Vivadent, patients with discolored teeth from smoking, age, or heavy consumption of coffee or colas are excellent candidates for treatment. Depending on the individual case, instructions call for one or two daily treatments for one to two hours each. Optimal results are noted in about two weeks. A Standard Pack of VivaStyle® contains 6 Patient Kits and one set of instructions for the dentist. Each Patient Kit has 12 syringes of the tooth whitening gel, 12 dispenser tips, 1 tray case, two sheets of tray material and a travel bag with accessories. A Standard Pack can be ordered for $276.29 (retail) and $145.00 (government) from Vivadent at (800) 533-6825, (716) 691-0010, (716) 691-2285 FAX or www.ivoclarna.com.

(Col Charlton)

Filtek A110 is an esthetic, nonradiopaque, light-cured microfill resin composite designed for use in nonstress-bearing, anterior direct and indirect restorations where esthetics is of primary concern. 3M recommends it specifically for Class III and V restorations, selected Class IV restorations, direct and indirect veneers, and for limited use in Class I lesions in premolars. In Class IV lesions, 3M notes that A110 should be used only as a veneer over a hybrid resin composite. Filtek A110 is a Bis-GMA resin filled 40% by volume (56% by weight) with colloidal silica having a range in size of from 0.01 to 0.09 microns. Average filler size is 0.04 microns. The product is available in syringe and capsule form in a total of 20 shades in three different opacities (dentin, enamel, incisal). Recommended curing times are either 20 or 40 seconds depending on the opacity of the resin. A capsule introductory kit (item number 2221) contains 10 capsules each of 5 shades (A2E, A3D, B1, DYD, and incisal), a syringe of Scotchbond Etchant, a bottle of Single Bond Adhesive, and a packet of Sof-Lex polishing disks. The product can be purchased for $199.00 (retail) and $119.40 (government) by contacting 3M at (800) 237-1650, (612) 733-8524, FAX (800) 888-3132, or www.3m.com/dental.

(Col Charlton)

Ketac-Molar® Quick Aplicap® is a modified version of ESPE America s Ketac-Molar that has a shorter setting time than the original. ESPE America claims that the high-strength glass ionomer is suitable as a conservative posterior restorative, long-term temporary, core build-up material, and a liner under resin composite restorations. Some of its purported advantages include easy placement, chemical adhesion to tooth structure, fluoride release, and high wear resistance. The material is packaged in single-use capsules (Aplicaps) that are a hallmark of ESPE America s glass-ionomer line. An Intro Pack

(item number 056368) of Ketac-Molar® Quick Aplicap® contains 10 Aplicaps each of five shades (A1, A2, A3, A4, B2), tooth conditioner, glaze, metal activator, and metal applier. It is available for $200.00 (retail) and $127.30 (government) from ESPE America at (800) 782-1571, (610) 277-3800, (610) 239-2301 FAX or www.espeusa.com. A box of the 50 Aplicaps alone (item number 056369) is $153.75 (retail) and $97.85 (government).

(Col Charlton)

ProTec CEM Conditioner is a new addition to the already established hybrid resin/glass-ionomer luting agent from Vivadent called ProTec CEM. ProTec CEM is a self-setting cement that the manufacturer recommends for cementing PFM and all-metal restorations as well as endodontic posts. Other brands of hybrid resin/glass-ionomer cements (Fuji Plus, GC America and RelyX, 3M) have been shown to cause fractures of all-ceramic restorations because the cements expand following cementation. Vivadent maintains that ProTec CEM is different from them in that it exhibits less post-placement expansion and, as a result, it is acceptable for luting non-metal restorations such as those made of Targis/Vectris (Ivoclar), In-Ceram (Vident), or Procera (Nobel Biocare). The new addition to the product, ProTec CEM Conditioner, is purported to enhance bond strength to tooth structure and reduce dentin sensitivity. The conditioner is an aqueous solution of polyethylene glycol dimethacrylate and glutaraldehyde. It is applied to the prepared tooth with a brush for 15 seconds and dried with a gentle stream of air. No rinsing is done. A bottle of the conditioner is available for $112.00 (retail) and $49.00 (government) from Vivadent at (800) 533-6825, (716) 691-0010, (716) 691-2285 FAX or www.ivoclarna.com.

(Col Charlton)

DermaDam is a new powder-free rubber dam from Ultradent. Because it is powder-less, it is said to eliminate the potential of allergy to powder and to prevent the chance that powder will contaminate prepared teeth. Ultradent claims a very low surface content of latex proteins and significant leaching during the manufacturing process. DermaDam is 6 inches by 6 inches and comes in a box of 36. It is available in medium gauge (0.020 mm, item number REF/UP 311) and heavy gauge (0.025 mm, item number REF/UP 314) for $10.95 (retail) and $9.31 (government), respectively. The product can be purchased from Ultradent at (800) 793-5216, (801) 553-4915 FAX, or www.ultradent.com.

(SSgt Martin, Col Charlton)

Opti-prep Ultra from Ultradent is a polymer-based solution for cleaning dental and medical instruments prior to sterilization. The liquid can be used as a soak, a rinse, or in an ultrasonic cleaner. Ultradent claims that the product is nontoxic, nonfuming, biodegradable, and does not contain aldehyde, chlorine, or phenol. Another purported advantage is that it is noncorrosive and will not adversely affect edge sharpness of burs and cutting instruments. Ultradent maintains that Opti-prep Ultra is said to work at the molecular level to reduce biofilms and overall microbial loads. The cleaner is supplied in powder form that is mixed with water to activate it. Each tub contains enough powder to prepare 37.5 gallons of solution. Once mixed, the solution maintains its effectiveness for 12 hours. Instructions recommend immersing instruments in the solution for 15 minutes for adequate cleaning. A 26.5-oz (750-g) container of Opti-prep Ultra (REF/UP 1180) is available for $64.95 (retail) and $55.21 (government) from Ultradent at (800) 793-5216, (801) 553-4915 FAX, or www.ultradent.com.

(Col Charlton)

Illuminé is an innovative, professionally applied, in-office bleaching product from Dentsply/Preventive Care. Illuminé is a departure from other in-office whitening treatments in the way it is packaged and applied. It comes in two coupled syringes: one contains a liquid (30% hydrogen peroxide) and the other contains a proprietary powder blend. Prior to treatment, a standard bleaching tray with reservoir areas is fabricated for the patient. At the time of use, the liquid contents of one syringe are expressed into the powder-containing syringe. The material is mixed by forcing it from one syringe to the other. The mixture is then expressed into the bleaching tray where, over a one-minute period, it is allowed to convert into a semi-solid gel. The tray is then inserted into the patient s mouth and excess gel is carefully removed from the gingiva. The patient can then return to the waiting room. At the end of a standard treatment period (30 to 60 minutes) the patient returns to the chair and the tray is removed. Dentsply claims that one treatment can effectively whiten teeth from 4 to 6 shades and that a post-treatment whitening continues for 24 to 72 hours that produces an additional one- to two-shade change. Another purported advantage of Illuminé is that it is less messy than most other whitening products because the gel s semi-solid consistency and adhesiveness limit its overflow from the tray. Illuminé can be used as a stand-alone product or as a "boost" treatment prior to using Nupro Gold, Dentsplys home bleaching product (see *DIS* 51-07). One kit of Illuminé (item number 614036) contains two sets of syringes, enough for two treatments. The product can be purchased for $59.50 (retail) and $38.50 (government) from Dentsply/Preventive Care at (800) 989-8826, (717) 767-8502, (800) 278-4344 FAX or www.prevent.dentsply.com.

(Col Charlton)

Porcelain Repair Kit from Ultradent is new product that the company claims contains all the components necessary to perform resin-bonded repairs of porcelain restorations. The kit consists of syringe tips and six plastic dispensing syringes: 1 syringe each of OpalDam, EtchArrest, Porcelain Etch, Silane, PQ1, and PermaFlo. OpalDam is a light-activated resin that is used to isolate gingival tissues in the vicinity of the repair. EtchArrest is a sodium bicarbonate gel that limits the extent of the Porcelain Etch (a 9.5% hydrofluoric acid) that is used to etch porcelain adjacent to the repair site. The EtchArrest can also be used to neutralize the etchant after treatment. After silanation and application of the PQ1 bonding agent, the fractured area can either be repaired with a resin composite (for larger fractures) or PermaFlo flowable resin (for smaller defects). One Porcelain Repair Kit (REF/UP 1108) can be purchased for $85.95 (retail) and $73.06 (government) from Ultradent at (800) 793-5216, (801) 553-4915 FAX, or www.ultradent.com.

(Col Charlton)

EmPower is a new dual enzymatic solution developed by the Metrex Division of Sybron Dental Specialties. EmPower was developed by the manufacturer to clean away blood, tissue, mucous, and other protein-rich body fluids. The product is purported to contain two different enzymes that work over a broad range of temperature and pH conditions. Lipids, starches, and inorganic debris is said to be can be cleaned away by specially added surfactants that prevent re-depositing on the instruments. Metrex claims that the solution is compatible with stainless steel, soft metals, hard plastics, rubber, and glass items because of its neutral pH. EmPower is available from Metrex at (800) 841-1428 or www.metrex.com for $85.50/case of 4 gallons (government). Retail prices can be obtained from local distributors.

(SSgt Martin)

Prime & Bond NT (capsules) is the new unit-dose form of Prime & Bond NT, the nano-filled dentin bonding agent from Dentsply/Caulk. DIS reviewed the non-capsule version in *DIS* 58-15 (September, 1999) and found that it bonded very strongly in laboratory tests and was fast and easy to place. One of its disadvantages, however, compared to products like OptiBond Solo (Sybron/Kerr), Prompt L-Pop (ESPE America), and Excite (Vivadent) was that it was not (at that time) available in a unit-dose form. DIS considers unit-dosing a positive feature because it enhances infection control. Dentsply/Caulk appears to have corrected that deficiency by now packaging Prime & Bond NT in a capsule. To use it, the capsule is placed in a holder and the top of the capsule is snapped off. A brush included with the kit is then used to apply the bonding agent. Prime & Bond NT in the new unit-dose form (item number 634356) can be purchased for $150.66 (retail) and $90.40 (government) from Dentsply/Caulk at (800) 532-2855, (302) 422-4511, (800) 788-4110 FAX or www.caulk.com.

(Col Charlton)

The **Hypo Intraosseous Needle** is designed to perforate the cortical plate and inject local anesthetic directly into the porous, interproximal bone for achieving single-tooth anesthesia. The needle is a one-step system that requires no predrilling. A 1/8-inch long, 30-gauge needle is reinforced with a plastic sheath and stabilized with a stainless-steel sliding sleeve that retracts into the needle body as the needle penetrates the cortical plate. The manufacturer (Dentsply - MPL Technologies) claims the sleeve gives the needle the necessary stabilization to penetrate the cortical plate, without bending or breaking during injection. The manufacturer also claims that the self-limiting needle achieves sufficient depth in the cancellous bone for rapid diffusion of the anesthetic. The needle, which fits any standard dental syringe, is disposable but may be used for multiple injections with a patient. The needles are available in boxes of 20 ($22.70 retail, $13.00 government), 50 ($53.60 retail, $28.25 government), or 100 ($99.95 retail, $55.35 government). Contact Dentsply-MidwestMPL at (800) 621-6421 for further information.

(Col Bartoloni)

Sporox II is a chemical sterilant and high-level disinfectant for heat-sensitive instruments. The product is a pre-mixed, clear, odor-free, 7.5% hydrogen peroxide solution that is tuberculocidal, virucidal, fungicidal, bactericidal, and sporicidal. The manufacturer, Sultan Chemists, claims that Sporox II oxidizes debris quickly and effectively at room temperature, and is safe for soft metal instruments containing brass or copper. At room temperature sterilization is achieved in six hours and high-level disinfection in thirty minutes. The product can be reused for up to 21 days. Test strips are available to determine when the solution needs to be changed, and the company manufactures a sterilizing/disinfecting tray to facilitate product use. Sporox II is priced at $25 per gallon (retail) and $15.00 (government) by and can be purchased by contacting Sultan Chemists at (800) 637-8582, (201) 871-1232, FAX (201) 871-0321, or www.sultanintl.com.

(Col Bartoloni)

Composi-Tight from Garrison Dental is a sectional matrix system used during the placement of posterior resin composite restorations. The product was evaluated and rated "Recommended" in *DIS* 56-

15 (Jan 1999), but it has undergone some changes since the original evaluation. The primary change is that the number of sectional matrix shapes has been expanded from three to five. As evaluated, the Composi-Tight System consisted of a two sizes of "G-rings" and three shapes of sectional matrix bands. The G-Rings are autoclavable and made of polished stainless-steel, and the bands are 0.0012 inches thick. Our evaluation indicated that the product produced effective interproximal contacts and excellent contours for posterior resin composite restorations. All of the DIS evaluators recommended buying it for their clinics. The new expanded number of bands are for 1) primary molars, 2) bicuspids and small molars, 3) bicuspids and small molars with subgingival extensions, 4) molars, and 5) for deep cervical restorations. For more information about this new version of the Composi-Tight System and the full range of Garrison Dental products, please contact the company at (888) 437-0032, (616) 842-2244, (616) 842-2430 FAX or www.garrisondental.com.

(Col Charlton)

Fresh & Go is an innovative new product that combines a source of toothpaste with a medium-bristled toothbrush. The handle, which is tube-shaped, holds a menthol-flavored, fluoride-containing toothpaste that is delivered to the brush head by turning a knob. The brush head comes with a protective, replaceable plastic cover that acts as a plug to prevent drying out of the paste. The manufacturer, Fresh & Go, USA, claims the product is ideal for travel, camping, office, and dining-out uses. It is also suitable for home use and may be particularly well-suited for individuals who have limited dexterity, are disabled, or are going through rehabilitation. The handle comes in various colors and is available in a children s version that contains bubble gum-flavored paste. The Fresh & Go Company claims that the product contains enough paste for 30 uses; it is not refillable. Fresh & Go is available for $2.99 (retail) and $1.00 (government) from Fresh & Go, USA at (773) 622-2211, (773) 622-1353 FAX, or www.freshango.com.

(Col Charlton)

GRADIA is a radiolucent, visible-light-cured, indirect restorative material for fabricating crowns, bridges, inlays, onlays, and veneers. The manufacturer, GC America, claims that the material s durability, natural opalescence, and lifelike esthetics are the result of its unusual chemistry. A micro-fine ceramic/pre-polymer filler is added to a urethane dimethacrylate matrix to produce a ceramic composite with supposedly high strength, wear resistance, and excellent polishability. The product comes in a broad range of shades and opacities. All shades use a short (10-second) light exposure for pre-polymerization during layering and characterization using the hands-free GC Steplight SL-I. The GC Labolight LV-III, self-contained light curing unit shaped like a burnout oven, is used for final curing. Finished restorations can be cemented using a resin cement or a hybrid resin/glass-ionomer cement such as GC s Fuji Plus or FujiCem. A Master System Pack (item number 301419) includes the master kit of GRADIA (which includes 10 shades), a Steplight SL-I, and a Labolight LV-III. The product is available for $5,500 (retail) and $2805.00 (government) from GC America at (800) 323-7063, (800) 423-2963 FAX, or www.gcamerica.com.

The Wand Plus from Milestone Scientific is a computer-controlled unit that accommodates a conventional anesthetic cartridge and needle through a disposable, plastic, pencil-like handpiece that is attached via sterile microtubing. The computer unit is activated by a foot control that automates the delivery of local anesthetic at a precise pressure and volume ratio with an advancing drip. The Wand was evaluated and rated "Marginal" in *DIS* 56-24 (Jan 1999), but it has undergone some significant changes since the original evaluation. The unit, now called The Wand Plus appears to address several of the original shortcomings noted by DIS. First, the manufacturer claims it immediately activates and aspirates rapidly, which makes its operation more similar to that of a standard aspirating syringe. The foot pedal, which DIS evaluators reported to be difficult to push and control, has been replaced by a metal foot control. The annoying audible alarm has been upgraded so that users can change the tone and its volume. An enhanced video, operating manual, and updated quickstart chairside cards are now available to reduce the learning curve for clinicians. The Wand Plus also has a "Cruise Control" setting that causes the syringe to deliver a steady flow of anesthetic solution without the user needing to maintain foot pressure on the pedal. The Wand Plus costs $1049 (retail) and $750 (government) and can be ordered from Milestone Scientific at (800) 862-1125, (847) 272-3207, (847) 559-1065 FAX or www.thewand.com.

(Col Charlton)

The Hawe PerioStar is a electrically-powered countertop machine for sharpening periodontal instruments. The unit, manufactured by the Hawe Neos Dental Company of Switzerland, has an horizontal arm with a clamp and a positioning device that Hawes claims makes it easy to accurately position each instrument prior to sharpening. The arm can also be extended along an arch to facilitate access to the instrument s edges. A vertical plastic arm holds two types of disk-shaped sharpening stones (a medium-grit and a Superfine-grit) which are provided with polishing paste. (A coarse-grit stone is available separately.) The vertical arm that holds the stone can be manually moved in a circle so that all necessary edges of the instruments can be reached for polishing. Hawe claims that the machine has

several advantages compared to hand sharpening. It produces precise sharpening regardless of the operator s skill level. Also, results are reproducible even when used on instruments that can are difficult to sharpen by hand (e.g., Gracey currettes). Lastly, Hawe claims that instruments are quickly sharpened with minimal effort. The PerioStar is available for $895 (retail) and $650 (government) from your local Patterson Dental Supply Office. To locate the the branch office near you, please visit http://www.pattersondental.com/html/branches.asp.

(Col Charlton)

Dental/Medical Diagnostic Systems, Inc (DMD) recently introduced the **Apollo-e** curing light. The battery-powered unit uses light-emitting diodes (LED) rather than the typical quartz-halogen bulb found in most curing lights. Advantages of using LED include an absence of heat and a long and constant light output. The software-driven system permits the user to custom program light exposures based on the particular resin composite being used. The unit is capable of polymerizing any composite activated within the normal spectrum of 410 nm to 500 nm. The Apollo-e offers a choice of several curing modes including continuous high output, pulse, and slow. The light costs $3,995.00 (retail) but has an introductory price of $2,445.00 for a short time. Please check with the company for current pricing. No government pricing is available. Further information is available from DMD at (800) 399-0999 or (818) 595-0226 FAX

(Col Leonard)

The **ESA** is a new disposable prophy angle designed and marketed by Preventive Technologies, Inc. ESA stands for Extended Straight Attachment. As can be seen in the accompanying photograph, the ESA is different from other disposable prophy angles in that the straight attachment is an integral part of the prophy head, thus eliminating the need for a separate straight attachment. The manufacturer claims that the ESA is 50% lighter than traditional straight attachments, which reduces hand and wrist fatigue. The prophy angle is available with either a soft or firm cup or with a tapered brush; in addition, a non-latex soft cup is available. The ESA is currently only available for use with the Midwest Shorty and Rhino slow-speed handpieces. A 100-count box of ESA angles costs $49.00 (retail), $32.00 (government) on orders of six boxes or more. For more information contact Preventive Technologies at (800) 474-8681, (704) 849-2416, (704) 849-2417 FAX, or www.preventech.com.

(Col Leonard)

Pumicide from Dentsply/Trubyte is a pre-mixed pumice for polishing denture resins. The product is supplied in a plastic tube which the company claims allows the user to dispense only the amount needed, thereby reducing waste. The medium-grit mix contains 1% Triclosan, a broad-spectrum antibacterial agent commonly found in hand soaps, deodorants, cosmetics, and toothpastes. Because it is already pre-mixed, Dentsply/Trubyte claims that mixing time is eliminated and clean-up time is reduced. A 5.5-ounce tube of Pumicide Denture Cleanser and Polishing Compound (item number 904837) can be ordered for $14.60 (retail) and $9.50 (government) from Dentsply/Trubyte at (800) 786-0085, (800) 735-1101 FAX, or www.trubyte.com.

(Col Charlton)

Alpha-Seal is a new fluoride-containing, light-cured pit and fissure sealant from Dental Technologies, Inc. The company claims that the sealant exhibits excellent wear resistance, has an ideal viscosity, and releases fluoride. Needle dispensers with a small lumen are provided for the syringes to facilitate placement. Alpha-Seal is available in two shades: a clear for patients who desire an "invisible" sealant and an opaque to allow easy identification during patient examination. A box of the product (item number 401-0009 for opaque; 401-0010 for clear) contains three 1.5-cc syringes of the sealant, one 4-g syringe of Alpha-Etch (a 37% phosphoric acid etchant), 20 disposable tips, and instructions. Alpha-Seal is available for $34.95 (retail) and $27.96 (government) from Dental Technologies at (800) 835-0885, (847) 677-5500, (847) 677-5502 FAX, or www.dentaltechno.com.

(Col Charlton)

The **IPS d.SIGN® Porcelain System** from Ivoclar is a new glass-ceramic fused-to-metal product for producing esthetic fixed prostheses. d-SIGN® is different from other ceramics in being a fluorapatite-leucite glass-ceramic that is used with six specially-formulated alloys. Ivoclar claims that the ceramic produces extremely life-like restorations because its crystals (shown at right) are similar to the needle-like crystals of hydroxyapatite in tooth structure (below right). As a result, d-SIGN® disperses light just as natural tooth structure does. Ivoclar also claims that the material causes the same amount of wear to opposing enamel as enamel itself. The special alloys that can be used with d-SIGN® include six of the most popular categories: high gold, reduced gold, palladium- based, palladium-silver, cobalt-chromium, and nickel-chromium. The d-SIGN® Basic Kit contains opaque pastes and dentin in shades A2, A3, A3.5, B2, B3, C3, D2, and D3. Three incisal shades and all necessary liquids are also included. The Basic Kit is available for $959.00 (retail) and $751.06 (government). For complete information on d-SIGN®, contact

Ivoclar North America at at (800) 533-6825, (716) 691-0010, (716) 691-2285 FAX or www.ivoclarna.com.
(Col Charlton)

Nitri-Care Gloves are the newest generation of powder-free nitrile gloves manufactured by Best Manufacturing Co. According to the company, the gloves contain no natural rubber latex proteins and are safe for use by individuals allergic to latex. The manufacturer also claims that the Nitri-Care gloves are extremely comfortable and offer a high degree of dexterity and tactile sensitivity, while minimizing hand pressure and fatigue due to their low-modulus formulation. The gloves supposedly have three times the puncture resistance of latex or vinyl gloves of comparable thickness and are highly resistant to chemicals commonly used in dentistry. They are available in the following sizes: small, medium, large and extra-large. Boxes contain 100 pairs. The manufacturer also produces sterile Nitri-Care gloves in sizes 6-7, 7-8, 8-9, and 9-10. For more information, contact Best Manufacturing at (800) 241-0323, www.bestglove.com, or call your local Sullivan-Schein or Patterson Dental dealer.
(Col Bartoloni)

Capture Forceps, from the North American Dental Corporation, represent a modification to traditional extraction forceps. With traditional forceps, an open area exists above the location where the two beaks grasp the tooth. If an extracted tooth should slip out of the beaks following extraction, it could potentially fall through this open area in the patients mouth and present an aspiration risk. Capture Forceps enclose most of this open area in order to "capture" teeth that break free of the forceps tips. Capture Forceps are available from North American Dental at (866) 222-7887. Currently only pediatric models are available, but the company plans to market other models in the future. The cost for one set of 150SC/151SC (two forceps) is $169 (retail) with price reductions if multiple sets are purchased. No government price is offered.
(Col Browning)

The **Accu-Dent® Impression System** for making dentate and edentulous impressions recently became available from Ivoclar North America. The system is purported to be a high-quality method for making precise impressions, and it uses two different irreversible hydrocolloid impression materials (syringe-viscosity and zero-flow tray viscosity) that are chemically compatible. The Accu-Dent® system uses specially-designed, sterilizable, reusable impression trays that are said to be easily modified. Accu-Dent® System 1 is designed for complete denture impressions whereas the Accu-Dent® System 2 is for partially edentulous impressions. Ivoclar states that the Accu-Dent® System 2 can also be used for the fabrication of orthodontic appliances, athletic mouthguards, splints, diagnostic casts, and bleaching trays. Each Accu-Dent® system includes the reusable Accu-Trays (15 of System 1, 12 of System 2), 18 packages each of Syringe and Tray Accu-Gel, thermometer, two syringes, water measuring vial, tray holder, storage box, and procedure manual. Both of the Accu-Dent® Systems are available for $275.00 (retail) and $165 (government) from Ivoclar at (800) 533-6825, (716) 691-0010, (716) 691-2285 FAX, or www.ivoclarna.com.
(Lt Col Roberts)

The **Osteopower** is an electric surgical handpiece system marketed by the OsteoMed Corporation. The handpiece has surface-integrated sensors that are said to allow the surgeon to control power level, direction of rotation, and handpiece speed. Foot pedal handpiece control is also available. The Osteopower system also permits two handpieces to be running with two separate foot controls from the same unit. This electrical surgical system is completely modular since all attachments are snapped on (analogous to a slow-speed handpiece) and function from a single, sealed handpiece motor. This modular design should obviate the need for the user to periodically return the unit to the manufacturer for maintenance as required with other electric surgical handpieces. Thirteen different surgical modules are available that are advertised for procedures from orthognathic surgery and implants to third molar exodontia. The Osteopower system offers 70,000 RPM under load with instant braking in 0.001 seconds. The system also has settings that limit handpiece operation to 30 RPM or less for implant procedures. A control console is available with an integrated irrigation pump that will allow sterile irrigation from the handpiece. Further information and pricing is available from OsteoMed at (800) 456-7779, (972) 241-3401, (972) 241-3507 FAX, or www.osteomedcorp.com.
(Lt Col Roberts)

The **HEM-608 Portable Wrist Blood Pressure Monitor** from Omron Healthcare, Inc. is an innovative product that automatically measures blood pressure and pulse using a small blood pressure cuff placed around the wrist. The device is purported to offer an inexpensive alternative to the traditional automatic blood pressure and pulse machines in use today. It fits securely around either wrist and has a circumference range of from 5¼ inches to 7¾ inches. The HEM-608 features an easy-to-read, digital, liquid crystal display, automatically inflates and deflates, and has a 14-memory storage capacity. Power is supplied by two AAA batteries. The device has a blood pressure range of from 0 to 280 mmHg and a

pulse range of from 40 to 200/minute. DIS is conducting an evaluation of the product and a full report is due in the spring of 2001. The HEM-608 is available for $156.00 (retail) and $86.68 (Government) from Omron Healthcare at (800) 634-4350, (847) 918-6707 FAX, or www.omron.com/ohi. Government facilities can contact J. Michael O Connor (Omron government representative) for information at (815) 236-8468 or via e-mail at oconnor@mc.net.

(SSgt Sutter)

The **ZAP Dual Curing** is a new curing light that uses a "dual curing" combination of 12 light emitting diodes (LED) and a 75-watt quartz-halogen bulb to polymerize restorative materials. The unit consists of a handpiece with an 8-mm autoclavable tip and a power supply box. It is manufactured by CMS-Dental in Denmark and distributed in North America by Soft-Core Texas, Inc. Two buttons on the handpiece allow the user to select one of two curing time settings: 1) 5 seconds LED plus 6 seconds combination halogen and LED, or 2) 5 seconds LED plus 12 seconds combination halogen and LED. Based on the "soft start" curing concept, the low power, pure blue LED light source begins the cure and then is joined by a high-power halogen light source to ensure adequate polymerization. Compared to conventional curing, this technique purportedly reduces composite stress and takes less time to accomplish. The ZAP Dual Curing light is available for $2,495.00 (retail); no government pricing is available. Further information is available from Soft-Core Texas Inc. at (888) 462-8878 or via e-mail at softcore1@earthlink.net.

(Col Leonard)

INSIGHT Intraoral Dental Film is a new F-speed x-ray film recently introduced by Eastman Kodak. Kodak claims that the film reduces patient radiation exposure by up to 60%, which may allay anxiety about x-ray exposures and may lessen overall wear to equipment by maximizing tube head life. Kodak also claims that the film produces sharp, high-contrast images, which results in crisper, cleaner radiographs for diagnosis. The film s faster speed is said to reduce blurring from patient movement. INSIGHT is purported to be easy-to-use and holds speed and contrast under varying chemistry conditions for more consistent and predictable images. INSIGHT is available in: sizes 0, 1, 2, 3, 4; single and double film packets; ClinAsept barrier packets for infection control; Super Poly-Soft; and paper packets. For more information, please contact Eastman Kodak at (800) 933-8031 or www.kodak.com.

(Col Bartoloni)

ALL-DRI from Allpro are flat, white, cotton pads (½ inch X 2 inches) that can be used in a manner similar to that of a cotton roll. The pads are very pliable and can be cut, rolled, and folded into various different sizes for ease of placement and positioning. For pricing and other information about ALL-DRI (item number 500), contact Allpro at (800) 243-2285, (303) 466-8965 FAX, or via e-mail at allpro2@attglobal.net.

(MSgt Belde)

All-Wipe is a soft, yellow, sponge-like pad with an adhesive back that is used to clean instruments during treatment. Once the protective paper is removed from the adhesive back of the pad, the pad can be temporarily attached to any convenient surface (e.g., bracket tray, back of gloved hand, etc.). The pad is 1½ inches square. All-Wipes (item number 520) come in a box of 50 for $6.45 (government price). For additional information or to order this product, contact Allpro at (800) 243-2285, (303) 466-8965 FAX, or via e-mail at allpro2@attglobal.net.

(MSgt Belde)

Pro-Paste from Allpro is a fluoride-containing prophy paste packaged in unit dose cups. Allpro claims that the paste "virtually eliminates splatter." Elimination of splatter is reportedly due to the paste s triple crystalline structure. Currently the paste comes in one flavor (mint) and one grit (coarse). A finger-ring cup holder comes with each package. The paste (part number is 530) is sold in boxes of 200 unit-dose cups for $19.95 per box (government price). To purchase, contact Allpro at (800) 243-2285, (303) 466-8965 FAX, or via e-mail at allpro2@attglobal.net.

(MSgt Belde)

Talon is a thermoplastic, resilient, acrylic material marketed by Comfort Acrylics. It is designed for application fabrication in treating temporomandibular disorders, sleep apnea, and snoring. The company claims that Talon appliances leach no additives or plasticizers and provide adjustment-free retention. Talon purportedly offers thermoplastic flow at body temperature but still retains the capability to be adjusted at room temperature. The acrylic is said to form strong bonds to cold-cure, heat-cure, and Ivocap acrylics. A 12-ounce tube of Talon (enough for 24 appliances) is available for $180 (retail price) and $162 (government price). For more information, contact Comfort Acrylics at (800) 748-2566, (360) 834-9218, (360) 834-4403 FAX, or www.comfortacrylics.com.

(Lt Col Roberts)

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.

BONDED AMALGAMS: A STANDARD OF CARE?

Clinical performance of bonded amalgam restorations at 42 months. Browning WD, Johnson WW, Gregory PN. J Am Dent Assoc 2000;131:607-611.

Bonded amalgam restorations have been placed for over a decade and many advantages have been attributed to them. Most of the purported advantages, however, have been based on the results of laboratory studies. This article presents the results of a clinical study of two groups of patients, one which received bonded and the other which received nonbonded amalgam restorations. The nonbonded admixed amalgam restorations were placed using conventional basing techniques consisting of a bulk placement of zinc phosphate cement followed by a copal varnish. The bonded admixed amalgam restorations were placed after an adhesive resin liner (OptiBond, Kerr) was applied and light activated. Over a 42-month period, the following clinical characteristics of the restorations were rated by a blinded evaluator: secondary caries, anatomical form, and marginal adaptation. Results indicated that all restorations in both groups were retained, were free of secondary caries, and were rated as clinically acceptable. No statistically significant differences were found between the two groups of restorations. **While the authors concluded that the bonded amalgam restorations performed as well as nonbonded restorations in this study, they cautioned against establishing bonded amalgam restorations as a standard of care. A cost-benefit analysis, for example, needs to be performed by the profession before a decision in this regard is made.**

CAN DESENSITIZERS BE USED UNDER CROWNS?

Effect of dentin desensitizers and cementing agents on retention of full crowns using standardized crown preparations. Yim NH, Rueggeberg FA, Caughman WF, Gardner FM, Pashley DH. J Prosthet Dent 2000;83:459-465.

The use of dentin desensitizers for reducing sensitivity after crown preparation or before cementation has been shown to be effective. Unfortunately, little research has been done to assess the effect that different kinds of desensitizers have on the retention provided by cements. This laboratory study evaluated the effect of various desensitizers and cements on the retention of full crowns to standardized preparations made on extracted molars. After the teeth were prepared, one of two desensitizers was applied: All-Bond 2 (a polymerizable desensitizer) or Gluma Desensitizer (a nonpolymerizable desensitizer). A group of teeth was not treated and served as the control. Crowns were fabricated and cemented with a zinc phosphate (Flecks), glass-ionomer (Ketac-Cem), resin-modified glass-ionomer (Fuji Plus), or resin cement (Panavia 21). Twelve crowns were made and cemented for each combination of desensitizer and cement. After 48 hours, the amount of force required to remove the crowns from the teeth was measured. Statistical analysis found significant differences between desensitizers and between cements. The relative retentive strengths of the cements was: Panavia 21>Fuji Plus>Ketac-Cem>Flecks. The combination of the polymerizable desensitizer (All-Bond 2) and Panavia 21 provided the greatest retention. The use of the polymerizable desensitizer (All-Bond 2) increased crown retention when the crowns were cemented with the resin or resin-modified glass-ionomer cement. The nonpolymerizable desensitizer (Gluma Desensitizer) decreased retention when the crowns were cemented with the resin, glass-ionomer, or zinc phosphate cement. Retention provided by zinc phosphate was reduced by both desensitizers. **The authors concluded that dentin desensitizers can significantly affect the retention provided by dental cements.**

RESTORING CLASS V LESIONS: WHAT MATERIAL SHOULD I USE?

Tooth-colored filling materials for the restoration of cervical lesions: a 24-month follow-up study. Folwaczny M, Loher C, Mehl A, Kunzelmann KH, Hinkel R. Oper Dent 2000;25:251-258.

During the 1990s, polyacid-modified resin composites (compomers) and resin-modified glass-ionomers were developed as alternatives to more traditional restorative materials such as resin composites and glass ionomers. There has been a great deal of discussion regarding how well these newly developed products serve as restorative materials in different clinical situations. This study evaluated the clinical performance of cervical restorations 24 months after placement. One hundred

ninety-seven Class V restorations were placed in 37 patients to restore defective existing Class V restorations, to treat primary caries, and to restore erosion/abrasion lesions. The teeth were randomly restored with either Tetric (hybrid resin composite), Dyract (compomer), Fuji II LC (resin-modified glass ionomer), or Photac-Fil (resin-modified glass ionomer). At 24 months, evaluators rated the following performance parameters of the restorations using a modified USPHS rating scale: color stability, anatomical form, surface texture, marginal integrity, marginal discoloration, and loss of filling. Statistical analysis revealed that the resin composite performed better than the three other types of restorative materials. The compomer gave slightly inferior results compared to the composite. Several of the resin-modified glass-ionomer restorations were rated as clinically unacceptable for one or more of the criteria. **The authors concluded, on the basis of this study, that resin composites and compomers may be better suited for the treatment of cervical lesions.**

PACKABLE RESIN COMPOSITES HOW DO THEY COMPARE?

Physical properties of three packable resin-composite restorative materials. Kelsey WP, Latta MA, Shaddy RS, Stanislav CM. Oper Dent 2000;25:331-335.

During the last few years, new resin composites have been marketed that are purported to be better than standard posterior resin composites. Chief among the various advantages is their thicker viscosity which makes them packable, thereby making it easier to establish interproximal contacts. One of the ways manufacturers achieve this packability is through the inclusion of various shapes and sizes of filler particles and by increasing the percentage filler content. Because physical properties generally improve when filler content is increased, one would expect the packable resin composites to exhibit better physical properties than standard resin composites. This study measured the diametral tensile strength, elastic modulus (rigidity), transverse strength, and fracture toughness of three packable resin composites (ALERT, Jeneric/Pentron; SureFil, Dentsply/Caulk; Solitaire, Heraeus Kulzer) and compared them to those of two standard hybrid products (Z100, 3M; Prodigy, Sybron/Kerr). Results indicated that all five resins were statistically similar in their mean diametral tensile strengths. ALERT and Soiltaire had significantly lower mean transverse strengths than Prodigy, SureFil, and Z100. ALERT had a significantly higher mean elastic modulus and higher mean fracture toughness than the four other products. **The authors concluded that the packable resin composites in this study exhibited a range of physical properties. ALERT and SureFil were comparable and, in some cases, better in their physical properties than the conventional products Z100 and Prodigy. Solitaire s lower transverse strength, elastic modulus, and fracture toughness may be a concern clinically.**

USING COMPOSITE PINS TO RETAIN CLASS IV RESIN RESTORATIONS

The use of resin composite pins to improve retention of class IV resin composite restorations. Roberts HW, Hermesch CB, Charlton DG. Oper Dent 2000;25:270-273.

Although use of the total etching technique and today s current-generation dentin bonding systems has greatly enhanced the retention of resin composite used to restore Class IV lesions and defects, these restorations have a greater failure rate than Class III restorations. Also, a survey of dental schools indicates that some teach the placement of indirect porcelain veneers or direct composite veneers as an alternative to large Class IV restorations. This study evaluated the use of an intracoronal resin composite pin to improve retention of Class IV resin composite restorations. A control group of 16 bovine incisors were prepared with standardized Class IV preparations, treated with OptiBond bonding agent (Sybron/Kerr), and restored with Herculite XRV (Sybron/Kerr). An experimental group of 16 teeth were prepared in the same way, except that a 1-mm-deep by 0.8-mm-diameter pin channel was placed in the tooth 1 mm from the dentinoenamel junction using a #330 bur. These teeth were also bonded and restored. After one week, an Instron machine was used to place a force on the restorations at 90 degrees to the long axis of the teeth. The load at failure was then recorded. Results indicated that a significantly great mean force was required to fracture the restorations from the preparations when the pin channel was included. **The authors concluded, on the basis of this study, that resin composite pins significantly increased the retention of Class IV resin composite restorations.**

DENTAL LABORATORY DISINFECTION PRACTICES

Disinfection and communication practices: a survey of U.S. dental laboratories. Kugel G, Perry RD, Lalicata P. J Am Dent Assoc 2000;131:786-792.

Dental laboratory technicians are potentially exposed to microorganisms during the handling and pouring of impressions and casts. Disinfecting impressions is an important procedure to reduce this risk. The disinfection process needs to be adequate to eliminate microbial contamination, without adversely affecting dimensional accuracy or surface detail. Several variables during disinfection can affect impression materials including type and concentration of disinfectant, their compatibility with specific impression materials, and the exposure time. Past studies have shown a lack of consensus between dental practitioners and laboratory personnel with regard to methods and materials for disinfecting impression materials. This article reports the results of a telephone survey of 400 dental laboratories. The survey was designed to determine how well dentists are communicating with laboratory personnel

about impression disinfection, and what laboratory technicians are doing to protect themselves against microbial cross-contamination from handling and pouring impressions. The survey showed that 44 percent of the respondents reported knowing whether or not the impressions received had been disinfected. Twenty-three percent did not know the method of disinfection used and 47 percent did not know the length of time involved. Forty-five percent of the respondents stated that they receive inadequate instructions in regard to disinfection technique. Laboratory-perceived problems with impressions were not linked to the type of impression material, but more to the disinfection technique that was used. The results show a lack of communication between dentists, dental staff members, and dental laboratory personnel. **The authors suggest that better communication between clinicians and their dental laboratories could eliminate problems. In addition, impression material manufacturers should provide specific instructions about disinfectant solutions and techniques that are compatible with their products.**

TELEDENTISTRY IS HERE!

Practicing dentistry in the age of telemedicine. Golder DT, Brennan KA. J Am Dent Assoc 2000;131:734-744.

The practice of medicine and dentistry is changing due to the growth of the Internet and electronic media. Information is now accessible to all healthcare workers and to the general public. Telemedicine and teledentistry have the potential to improve access to care, improve the delivery of health care, and lower its costs. There are many legal issues, however, that are developing because of this new technology. This article reviews some of the possible legal pitfalls inherent to teledentistry including dental licensure, malpractice, jurisdiction, privacy, security, informed consent, and technological/ethical issues. From the discussion, the authors conclude that medicine and dentistry need to resolve several concerns before realizing the potential benefits of telemedicine and teledentistry. **All dental providers should educate themselves as to the legal, technological and ethical issues of teledentistry using it.**

TO PROPHYLAX OR NOT TO PROPHYLAX, THAT IS THE QUESTION

Coronary artery stents: review and patient-management recommendation. Roberts HW, Redding SW. J Am Dent Assoc 2000;131:797-801.

Atherosclerotic coronary artery disease is a significant health issue in the United States. One treatment modality is balloon angioplasty. This technique has two shortcomings: vessel closure during the procedure and restenosis within the first six months after the it. The use of stents can reduce the complications of angioplasty. Stents are expandable metal scaffolds that physically open and support closed or blocked arteries. Seven types of stents have been approved for use in the United States. The majority are balloon-expandable, mounted on an angioplasty balloon catheter, and delivered with or without a protective sheath. Prior to treating patients who have coronary artery stents, dental providers should consult with the patient s physician to obtain specific details of cardiac history and present status. They should know the patient s antiplatelet regimen and have an understanding of possible drug effects/interactions in order to avoid problems when prescribing medications. Dental health care providers should also consider the use of prophylactic antibiotics for bacteremia-producing dental procedures when the procedures are performed within 30 days of stent placement. **This article is an excellent overview of coronary artery stents, their complications, the use of anticoagulation therapy, and management of stent patients who require dental treatment.**

WHITER AND BRIGHTER

A clinical evaluation of carbamide peroxide and hydrogen peroxide whitening agents during daytime use. Mokhlis GR, Matis BA, Cochran MA, Eckert GJ. J Am Dent Assoc 2000;131:1269-1277.

Bleaching of vital teeth for esthetic purposes has become a popular procedure sought by dental patients. The most popular bleaching solutions are carbamide peroxide (CP) and hydrogen peroxide (HP). Initially, hydrogen peroxide was used only for in-office whitening, and carbamide peroxide was used for home bleaching. Over the last few years, hydrogen peroxide has been made available for at-home use. Usually, the concentrations of these hydrogen peroxide bleaching agents are lower than the concentrations of carbamide peroxide products. This is because CP breaks down into HP and urea, with the HP concentration about a third that of the CP concentration. This clinical, double-blind study compared the effectiveness of equivalent concentrations of two types of at-home bleaching products: a 20% CP and a 7.5% HP. Twenty-four patients participated in the study in which the two bleaching gels were randomly applied to the right and left maxillary teeth. Patients were instructed in applying the gels using trays for two one-hour daily sessions that lasted two weeks. Patients were recalled at 1, 2, 3, 6, and 12 weeks for color evaluation using a colorimeter and a shade guide. Gingival and tooth post-treatment sensitivity were also assessed. Results indicated that the 20% CP resulted in significantly greater lightness than the 7.5% HP during the first 14 days of the study. By the end of the study, however, there was no significant difference between the two products in lightness. No difference was found between the products with regard to sensitivity. **The authors concluded that Both CP and HP are effective at-home bleaching agents for daytime use.**

BLEACHING, ONE MORE TIME

A clinical evaluation of 10 percent vs. 15 percent carbamide peroxide tooth-whitening agents. Kihn PW, Barnes DM, Romberg E, Peterson K. J Am Dent Assoc 2000;131:1478-1484.

A growing number of companies are marketing carbamide peroxide home-bleaching products that are available in more than one concentration. Products from the same company are often marketed in both 10% and 16% concentrations or in 10% and 15% concentrations. Clinicians rightly wonder what the clinical difference is between them, if any. This study was a clinical evaluation of the whitening ability of two carbamide peroxide home bleaching gels: a 10% concentration and a 15% concentration. In addition, the study assessed tooth sensitivity to determine if there was any significant difference between the two concentrations. Fifty-seven patients who desired tooth whitening were assigned to one of two groups. One group received a two-week treatment of their maxillary arches with a 10% concentration of carbamide peroxide (Nupro Gold, Dentsply/Preventive Care), and the other received the same treatment but with a 15% concentration. Patients wore their bleaching trays for a minimum of 4 hours daily. Records were kept by the patients to verify that they applied their respective gels for the same period of time each day and to record sensitivity during and after treatment. Results indicated that there was no significant difference in shade change from baseline between the two groups at the mid-treatment point (i.e., one week). At the end of the two-week treatment and at two weeks post-treatment, the group that used the 15% concentration showed a significantly greater degree of shade change than the 10% group. No significant difference in average tooth sensitivity was noted between the two groups, however sensitivity varied significantly between patients in the 15% group. **The authors concluded that properly performed at-home bleaching can be is an effective treatment, regardless whether a 10% or 15% carbamide peroxide concentration is used, however the 15% concentration has a greater whitening effect and causes varying sensitivity.**

SAFETY SYRINGES REVISITED

Dental safety needles effectiveness: results of a one-year evaluation. Cuny E, Fredekind RE, Budenz MA. J Am Dent Assoc 2000;131:1443-1448.

Dental healthcare workers are concerned about occupational exposure to pathogenic microorganisms. Recently, devices such as safety needles and syringes have entered the dental market and their manufacturers claim they reduce the risk of disease transmission from percutaneous injuries. Some government agencies and many state legislatures have passed regulations mandating the use of these devices, including dental anesthetic safety needles. The authors of this study evaluated four types of dental safety needles and syringes for clinical acceptability. Two of the devices were found to be unacceptable because of difficulty in changing anesthetic cartridges and inability to retract the needle if solution was left in the cartridge. The other two devices were also judged as unacceptable during a 52-week user trial. **The authors concluded that none of the safety devices passed the evaluation and none was found to be safer than traditional anesthetic syringes and needles.**

DENTAL UNIT WATERLINES WILL NOT DIE

The dental waterline controversy: defusing the myths, defining the solutions. Mills SE. J Am Dent Assoc 2000;131:1427-1441.

The issues of dental unit waterline contamination and its effect on the health of dental patients remain quite controversial. There is confusion about the importance of the problem because of the absence of well-documented links to health problems and a lack of consensus regarding the best approach to solving the problem. This article reviews the underlying biological causes of waterline colonization by microbes, the evidence of potential health consequences, and the possible ways of improving the quality of dental unit water. The author also describes examples of devices currently marketed to improve and maintain the quality of dental treatment water. **This article is a timely and inclusive discussion of the available options for improving the quality of water used in dental treatment.**

HYBRIDS VS. PACKABLES VS. MICROFILLS: WHICH ARE THE BEST?

The physical properties of packable and conventional posterior resin-based composites: a comparison. Cobb DS, MacGregor KM, Vargas MA, Denehy GE. J Am Dent Assoc 2000;131:1610-1615.

Posterior resin composite restorations are becoming more popular because of patient demands for esthetic restorations. Unfortunately, resins have several shortcomings when used in the posterior dentition, including technique sensitivity, achieving adequate interproximal contact, and lack of packability. Recently, manufacturers have marketed so called "condensable" or "packable" resin composites that are purported to address some of these shortcomings. This study was a laboratory evaluation of three packable resin composites and compared them to one hybrid and to one microfill resin composite. The researchers measured the diametral tensile strength (DTS), compressive strength (CS), flexural strength (FS) and depth of cure (DC) of the following products:

Product	Manufacturer	Type of Resin Composite
ALERT	(Jeneric/Pentron)	Packable
SureFil	(Dentsply/Caulk)	Packable
Solitaire	(Heraeus Kulzer)	Packable
TPH Spectrum	(Dentsply/Caulk)	Hybrid
Heliomolar RO	(Ivoclar/Vivadent)	Microfill

Results indicated that:

1. Spectrum TPH had significantly higher DTS and FS than the other products.
2. ALERT and SureFil had comparable DTS and FS, which were greater than Heliomolars.
3. Solitaire had significantly lower DTS and FS than the other products.
4. SureFil had the highest CS followed by TPH Spectrum, Solitaire, and ALERT (which were comparable). All four were significantly greater than Heliomolar.
5. TPH Spectrum and ALERT had significantly greater DC than the other products.

The authors concluded that while the packable resin composites (ALERT, SureFil, Solitaire) had physical properties superior to those of the microfill (Heliomolar RO), they were no better suited for use as a posterior restorative material than the hybrid (TPH Spectrum).