Where can I find available excess equipment for my clinic? (5/12)

**Question:** Our clinic is expanding our space to include a dental laboratory area. Where can I find available excess dental equipment?

**Answer:** Assets determined to be excess to local base/post needs are moved to the excess inventory category in DMLSS. Available equipment valued at $250.00 and greater can be accessed by going to [https://medlog.detrick.af.mil](https://medlog.detrick.af.mil), click the Supply tab, Applications tab, and then TRIMEDS. To make this process easier, identify equipment items needed by stock number, document number, and quantity. Next, contact your servicing logistics (MEMO Office) with this information, let them identify available excess equipment and ship items to you free of charge. NOTE: It is recommended to contact losing MEMO Officer about the equipment history (e.g., maintenance and age) before requesting excess item(s). If you have any questions about excess equipment, please contact the Excess Support Team at Fort Detrick, DSN: 343-4170 or COMM: 301-619-4170.

![Tri-Service Medical Excess Distribution System (TRIMEDS)](image-url)

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Purchases from Manufacturer vs. Dental Supply Co. (2/06)
**Question:** Should dental equipment items and/or dental supplies be purchased from a dental supply company or directly from the manufacturer?

**Answer:** Whenever possible dental equipment should be purchased directly from the manufacturer. This should ensure the lowest possible price and, when installation is required, it should ensure installation by manufacturer-trained technicians.

Recently a large equipment item was purchased from a dental supply company, rather than from the manufacturer. Not only was the purchase price substantially higher than the GSA contract price, but there were some installation issues that could have been better handled by the manufacturer. Ensure that you search for the lowest price possible before completing AF Form 601. This normally includes determining whether or not there is a GSA or VA contract and contacting the manufacturer directly.

Most dental supply items (e.g., amalgam, composite, anesthetic) purchased directly from a manufacturer with a GSA contract will cost less than if purchased from a dental supply company. It may be more convenient to purchase all dental supplies from a dental supply company, but going directly to the manufacturer and comparing prices before making a purchase will help ensure getting the lowest possible price.

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**In-Office Bleaching Using a Light Source (10/05)**

**Question:** Does light increase the efficacy or rate of in-office bleaching?

**Answer:** Hydrogen peroxide may be used chairside at 15 to 40% concentrations to lighten vital teeth over the course of several office visits. Heat and light have been used empirically in an attempt to catalyze hydrogen peroxide decomposition and speed vital-tooth lightening. Several studies have indicated that the use of light and heat activation has almost no effect on the lightening process with various in-office materials.1-4 Contact time and concentration of the active ingredients are critical factors.5 Using a split-arch design, a clinical study by Hein and others found that neither the heat produced by lights, nor the light output was responsible for catalytic activity. However, their data did demonstrate positive effects from the proprietary chemical catalysts mixed into each bleach gel before use.2 A clinical study by Tavares and others found that light could increase the tooth-whitening effect of hydrogen peroxide.6 However, the study and its design were subsequently challenged with published comments to the editor.7 The use of light and heat may cause sensitivity during and after treatment and may unnecessarily complicate the treatment process.8 Unless future clinical research proves otherwise, the use of light to augment in-office bleaching is not necessary.9-11

**References**
Chairside CAD/CAM Technology (6/05)

Question: What is the CEREC 3-D system and has DIS evaluated it?

Answer: CEREC 3-D is the latest version of computer-assisted design/computer-assisted machining (CAD/CAM) technology. CEREC has been available commercially since 1987 and is currently manufactured by Sirona Dental Systems. CEREC 3-D may be used chairside to fabricate ceramic and composite inlays, onlays, crowns and veneers using an optical impression of the prepared tooth with an infrared camera. The final restoration is designed using the system software and carved from a solid block of ceramic or composite using two separate diamond burs in a separate milling chamber that may be connected wirelessly from another room. Preparations may be restored in a single appointment, eliminating the need for an impression, provisional restoration, and laboratory fabrication of the final restoration.

Steady improvements in both software and hardware technology have progressed from the original CEREC 1 system through CEREC 2 to CEREC 3 and 3-D. Initial capabilities of the units were limited to inlays and onlays. Technological improvements increased the range of restorations capable of being milled, to the extent that virtually any shape can now be made. Improvements reduced the impact of operator variables on the quality of the restoration. Better marginal fit and greater occlusal anatomy may be more predictably created into the restorations. CEREC 3D allows a three-dimensional view of the preparation and proposed restoration.

The USAF Dental Investigation Service has not evaluated the CEREC system. However, the US Navy has utilized the CEREC 3-D system for nearly a year in their dental clinics at Great Lakes, IL. The system was used to provide single appointment, full-coverage, all-ceramic restorations for patients. Dentists were trained by the manufacturer during a 3-day basic course. A steep learning curve was overcome and by the third week the time required per procedure was reduced by nearly fifty percent to 2.4 hours. Overall, the CEREC 3-D system was readily accepted by the dental providers, assistants, and patients.

The Great Lakes Naval Training Center is responsible for basic training of new Navy recruits. Many recruits have limited time available for dental care, especially definitive prosthodontic treatment. The CEREC 3-D system provided full-coverage, all-ceramic restorations in one appointment on recruits who may otherwise be unavailable for traditional, indirect, full-coverage restorations for several months, often times at their next duty station. Over 400 restorations were placed during the clinical trial. The average increase in productivity of the dentists using the CEREC system was reportedly 19.5%. Data on clinical performance over time was not possible or practical due to the transient nature of the patient population. Eliminating the laboratory cost of providing prosthodontic care, as well as the savings in reduced number of appointments, reportedly resulted in the greatest cost benefit.
The majority of published clinical studies have been based on the earlier versions of CEREC. A 1999 systematic review of 15 clinical studies by Martin and Jedynakiewicz found a high success rate of intracoronal restorations with a mean survival rate of 97.4% over a 4.2-year period. They found an estimated survival rate after 10 years of 89%. Better results were found using a chemically-cured resin cement over a dual-curing resin cement. Another 10-year prospective clinical study by Otto and De Nisco found a 90.4% success rate of CEREC inlays and onlays. The majority of failures were due to ceramic fractures. In another study, 1010 inlays and onlays were evaluated 9 to 12 years after placement. Restoration survival was determined to be 90% after 10 years and 85% after 11.8 years. Premolars performed better than molars and vital teeth provided better results than non-vital teeth. Posselt and Kerschbaum placed 2329 inlays and onlays in 794 patients and calculated a probability of survival of 95.5% after 9 years. Larger all-ceramic restorations were evaluated after 3 years in a clinical study by Reich and others. Of 58 restorations, only one restoration had to be replaced due to bulk fracture and one other demonstrated poor marginal integrity. The authors noted that with larger restorations, occlusal relationships became more significant. Clinical Research Associates (CRA) evaluated full coverage crowns created with CEREC 2 and 3 systems. Very good marginal fit was reported for 100% of crowns and after 2 years, no fractures were reported. Wear of opposing teeth was similar to CRA data on metal-ceramic crowns. CRA concluded that CEREC materials had the potential to serve as well or better than other available metal-free technologies. Longer-term clinical studies are needed evaluating larger, full-coverage restorations created with the CEREC 3-D system.

In summary, the CEREC 3-D system is emerging technology that involves scanning of a preparation chairside and computer-assisted three-dimensional design of a restoration. A separate computer-assisted machining of a solid block of ceramic or composite resin creates an indirect restoration for immediate cementation. Advantages of the system include the ability to provide an esthetic restoration in one appointment with reduced chair time and expenses by eliminating impression taking, provisionalization, and laboratory fees. Longer-term clinical studies evaluating all-ceramic inlays and onlays created with the original CEREC systems appear favorable. Disadvantages include a high initial equipment cost, a steep learning curve, potentially more challenging shade matching, and an uncertain long-term clinical performance with the larger, full-coverage restorations. Case selection appears to be critical.

CEREC 3-D is available from Sirona Dental Systems. Government price for the entire system (GSA Contract Number V797P 3806K) is approximately $64,995.00. More information is available at (800) 659-5977, (704) 587-0453, (704) 587-9394 FAX, or www.cereconline.com.

References
**Question:** I have heard a lot about apex locators for use in endodontics. What are they and what are they used for? Do you have any helpful hints about how to use them?

**Answer:** Electronic apex locators (EALs) were developed to aid in length determination during root canal therapy. They can save time in determining initial working length, and can be particularly helpful when the periapex is unclear on radiographs or when there is a question about whether a perforation has occurred. A number of in vivo studies (at least seven) have shown accuracy ranging from 83-100%. EALs have gone through at least three generations of development. Early versions used a direct current which was rather unreliable. The next generation was improved by use of alternating currents, and the most recent EALs use multiple alternating currents of different frequencies. Each of these changes have made them more accurate and reliable. Two of the most popular current EALs are the Root ZX by J. Morita, and the Apex Locator AFA (All Fluids Allowed) by EIE/Analytic Technology. Apex locators function by using the body to complete an electrical circuit. They measure the difference in electrical impedance (resistance to a current, in ohms) between the lip and the file in the tooth. The EAL is connected by wires to the lower lip and to a file which is placed in the root canal. The impedance between the lip and the periodontal ligament (PDL) is a known value, so as the file tip is advanced toward the PDL, the EAL detects the changing impedance values and indicates the approach to the apex on its screen. When the PDL is contacted by the file tip, an audio alert is sounded and it is indicated visually on the screen. Since the file is contacting the PDL it is slightly past the apical constriction. This information can then be used in length determination. Like any new technology, there is a learning curve for EALs. It takes some practice to learn how to interpret the readings on the screen and develop confidence in their accuracy. Do not give up after a few tries. Some clinicians are so confident in their use of EALs that they take only preoperative and postoperative radiographs. For most clinicians, however, it is advisable to confirm working length with a radiograph. There are several tips which are helpful in using EALs. Turn on the EAL and allow it to self-equilibrate before connecting to the patient. Be sure the file and lip clip do not contact metal restorations. Non-conducting irrigants give the most accurate readings. These include RC Prep, alcohol or dried canals. Conducting irrigants, such as sodium hypochlorite or saline are more problematic. If a conducting irrigant is used, be certain that it doesn't allow conduction to another canal or a metal restoration. Some apex locators claim to be equally accurate with all irrigants, but clinical experience and recent literature indicates that this is not the case. When determining working length, select a file that fits snugly at the apex. Advance it slightly past the apex and pull it back to make your readings. Do it several times to verify. If the readings are not reproducible, they probably are not accurate. Inaccurate readings sometimes occur when a periapical lesion is present.

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**Using Wrist Blood Pressure Monitors in the Dental Clinic** (Originally published in May 2002)

**Question:** Our clinic is currently using a wrist blood pressure (BP) monitor. Our Medical Maintenance people told us that it isn't possible to do periodic maintenance on them and that there is no way to verify their accuracy. As a result, they won't place periodic maintenance stickers on the monitors. Are wrist BP monitors appropriate for use in a federal dental clinic since their accuracy can't be checked?

**Answer:** DIS believes that wrist BP monitors are acceptable for measuring blood pressure in screening situations such as an annual dental examination, however they should not be considered an alternative to traditional automatic blood pressure machines where the cuff is placed on the upper arm. There is no denying, however, that blood pressure monitors that use a cuff placed around the wrist are becoming very popular. This is probably because they are faster to apply than arm-cuff models, easier to use, and allow you to take measurements without the patient needing to remove his/her coat or adjust their shirtsleeve.

DIS recently evaluated one wrist BP monitor (HEM-608, Omron Healthcare; see DIS 62-17) and found it to be quite accurate compared to a traditional automatic BP monitor. One of our concerns during the evaluation was the fact that, unlike arm-cuff monitors, this monitor couldn't be calibrated and easily checked for accuracy. The manufacturer of the evaluated units states that their devices are factory calibrated and purportedly never need recalibration. During our testing, we received documentation from the manufacturer verifying the unit's accuracy during factory calibration. We did a side-by-side test using a calibrated automatic arm-cuff monitor. We found that both devices were within their claimed specified range and, as a result, we are comfortable with the use of this specific model for routine screenings. This
is not to say that wrist BP monitors are without problems. Consumer Reports magazine evaluated blood pressure monitors in 1992 and 1996. They found that wrist monitors were generally less accurate than arm-cuff monitors. It should also be noted that they are quite technique sensitive. For example, the wrist must be at heart level or inaccurate readings can occur. We recommend that if the patient's BP reading measured with a wrist monitor is abnormal, cuff placement and wrist position should be reassessed, the unit's battery power checked, and the reading re-accomplished. If still abnormal, you should retake the BP using a calibrated arm-cuff monitor. DIS strongly recommends that if you are using a wrist BP monitor, that you periodically verify its accuracy by comparing its readings to those obtained with a calibrated arm-cuff monitor. You can compare the wrist monitor's reading to that of the other monitor as well as to the manufacturer's claimed accuracy range (e.g., the wrist model DIS evaluated was purported to be accurate to ±3 mm/Hg or 2% of the reading, whichever was greater).

Because of these factors, DIS recommends that if a wrist monitor is used in a federal dental clinic, that it be limited to screening situations, such as annual dental examinations. During surgical or other types of invasive procedures, the traditional arm-cuff monitor should be used.

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Some Tips on Tips (9/11) UPDATED

Answer: Properly removing bioburden from dental instruments is a major infection control concern within any dental facility. One study has shown that ultrasonic cleaning does not remove all bioburden from within the lumen of metal three-way syringe tips. Although reusable air/water syringe (AWS) tips meet sterilization standards, accumulation of internal bioburden over time could potentially compromise sterilization procedures. Because of this and time consuming cleaning/sterilization procedures, many dental treatment facilities are now using disposable AWS tips. Compared to metal syringe tips, disposable AWS tips are easier to use, more convenient, and enhance infection control. However, before switching to them, there are some things you need to be know. First, some disposable AWS tips require adaptors so they can be properly retrofitted onto the existing dental units. Without these adapters, the tips may not fit securely into the three-way syringe head. Unfortunately, adaptors (which are available for an additional charge) are not made for all brands of dental units. Before you buy disposable AWS tips, ask the manufacturer if they provide adaptors for the brand(s) of units you have. You should also know that some brands of AWS tips lack the ability to swivel, which can make them inconvenient to use because you can't easily rotate them to gain access to certain areas of the mouth. An important limitation of currently-available disposable AWS tips is that none is adequately radiopaque. Although this may seem to be a minor deficiency, reports do exist of patients who have inadvertently ingested AWS tips, as we have noted on our Web site. If the tips are not radiopaque, it would make it very difficult (if not impossible) to locate the tip radiographically for retrieval. Lastly, while it may appear that the cost of using disposable AWS tips is more compared to metal syringe tips, it is important to remember that when determining the cost-effectiveness of disposable and reusable items, considerations must include the cost, time, and materials involved with decontaminating and reprocessing the reusable item, not just the cost of the disposable item.

It is important to consider the above items before switching to disposable tips. As always, the convenience and infection-control benefits must be weighed against concerns of additional cost.

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