



SEMBACH ADL INFORMATION UPDATE



Volume 2, Issue 3

15 December 1997

TOPICS OF INTEREST

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FROM THE TOP OF THE BENCH



Hello and Holiday Greetings from the men and women of the Sembach Area Dental Laboratory. 1997 was a very busy year in the dental laboratory field. Thank you for your patience and understanding during our peak periods. Currently, our hard working staff is humming along like a finely tuned machine. Productivity is high, and turn around times are low. As always, our goal is to give you, the customer, a high quality restoration in a timely manner. We are pleased to welcome Lt. Col. Gary A. Braun to our ADL staff. Dr. Braun is a board certified prosthodontist who comes to us from Travis AFB in California. Welcome to Germany, Gary.

The Staff has begun planning in earnest for our annual spring ADL workshop. This spring's workshop will be held on 12, 13, and 14 May 1998. This is an excellent low cost opportunity for dentists and dental laboratory technicians to receive continuing education in-theater. So mark your calendars now and look for registration packets to arrive in March 1998.

John J. Boyle, Jr., LtCol, USAF, DC
ADL Flight Commander

STOP and MAKE PLANS TO ATTEND THE ADL WORKSHOP IN MAY 1998

PLAN NOW- The Area Dental Lab Workshop will be Tuesday through Thursday, 12 - 14 May 1998. Travel days will be Monday, 11 May and Friday, 15 May. **REGISTRATION PACKETS** will be sent in the beginning of March with the Agenda of Events.

HOW ARE WE SERVING YOU?

It is most important to us that you return the quality control card with your comments upon completion of a case. It is the means by which we can provide you with the best appliance or service possible. We continually monitor the cases, and review your comments to ensure we supply you with the highest quality appliance possible. We need your feedback. Please take a moment when the case is completed and let us know, specifically if possible, what we did right, and what we may improve upon. Also please feel free to call us if you have any questions regarding your case.

We may be reached by E-mail:
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frank.bender@sembach.af.mil - Superintendent

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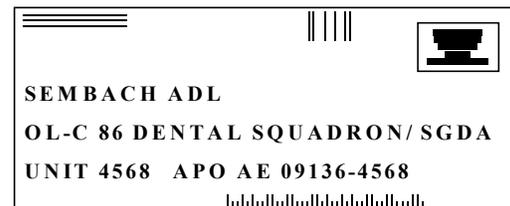
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WHAT'S NEW FROM THE LAB

Seasons Greeting from the Acrylic / Ortho Section. We are currently working with some new acrylics.

Denture base selection now provides several options for materials and shades.

Ivocap from Ivoclar Company – There are some advantages to the Ivocap System. First, *it is safer for the*

technician. Since the material is mixed in a closed tube, there is virtually no monomer fumes to be inhaled by technician. Second, *it is more accurate than other systems*. The system injects acrylic into a flask which is under 3 metric tons of pressure. Even though the processing time is less than conventional, there is virtually no perceptible processing error, or a 'zero' pin opening. This means occlusal errors are nearly zero, so adjustments are minimal. The downside is characterization. Although possible, characterization is more difficult because if the pre-placed characterization is not set to the doughy stage, it can be displaced by the 85 psi force used to inject the acrylic into the mold. I have not seen this to be a problem though.

The acrylic comes in two shades for denture bases: US-L, a light pink, short fibered resin; and US-P, a slightly darker cousin to US-L. I have difficulty telling the difference between the two (even when placed side-by-side).

Coe-Lor from Coe Laboratories – This is our ethnic shade resin and it comes in three shades: Mild, a very light purple-brown shade with fibers; Moderate, a slightly darker version of mild (if you ask for an ethnic shade and do not specify how dark, this is what we process it in); and Heavy, a very dark purple-brown shade and should only be used when the darkest pigmentation is necessary.. Unfortunately, we can not use this material with the Ivocap System because it cannot be injected into the mold. Like traditional denture acrylics, it must be flaked and trial packed.

CH-Lucitone and 199 – Of course we still have CH-Lucitone in all the common shades; Light, Light Reddish Pink, Reddish Pink, and Bluish Pink. We also have Lucitone 199 in Original Shade, and Light Reddish Pink.

Orthodontic Appliances and Night Guards

We are using Great Lakes Orthodontic Resin for our orthodontic appliances. This resin has a very fine grain, so it slumps less during sprinkling and processes very clear without porosity (even if benchtop cured). It comes in the normal pink and clear shades, but we also have a variety of colored resins including neon and glow in the dark (for your younger patients). We can even add multi-colored sprinkles to these appliances for a variety of designs.

For night guards we have several acrylics to choose from; Ivocap Clear, Heat Cured Clear Resin from Dentsply, and cold cured Great Lakes Orthodontic Resin. Our standard is to use either the Ivocap or Dentsply resins, because both adapt well and finish crystal clear. But if you prefer that your night guards not be quite as hard, just let us know and we will be sure to use the cold cure from Great Lakes.

If you have any questions for the Acrylic/Ortho Department please feel free to call myself, TSgt Patrick

Coon, or SSgt Celestine Christudoss and we will be happy to help you. You can also e-mail us at: patric.coon@sembach.af.mil

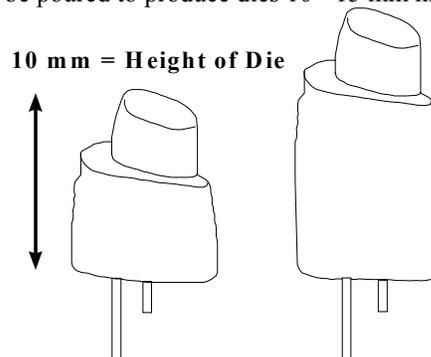
In an effort to help you provide the best restoration for your patients, we ask you use this list below as a guide for your RPD cases.

CASE SUBMISSION CHECKLIST - REMOVABLE

Master Cast
 Diagnostic Cast with RPD Design drawn on it
 Opposing Arch Cast
 RAPs with Matrices if anteriors are restored
 GO-BY Cast of existing anterior position with positions of lip marked for 'smile' and relaxed lines.
 Shade of Acrylic teeth
 Shade of Acrylic gingiva
 Type of posterior teeth / occlusal scheme
 Articulator settings if necessary
 Completed 2322 with any special instructions or design

TIPS FOR CASE SUBMISSION: Fixed

Trimming dies. High Dies can cause wobble resulting in improper fit and increased chair insert time. Casts should be poured to produce dies 10 - 15 mm high.



Solid Casts - Pindexed dies often have some "play" in them, which translates into chairside interproximal adjustments. Submission of a fixed case with a solid cast will improve the interproximal or a fixed partial denture framework fit and reduce chairside insert time.

GO-BY casts can alleviate many questions for those maxillary anterior cases requiring laminate veneers, FPDs, or even single crowns. Make an alginate impression / cast of the provisionals (if you like them) or the diagnostic wax-up, and send the cast with your case. This can tell us where you want the midline, a diastema, and the length, or width of a restoration. It is also helpful if you can transfer the patient's lip line to the cast in a relaxed and smiling position. Often we receive FPDs to be made to cover areas of anterior gingival defects. If the lip does not extend to this area on a smile, we will not attempt to place pink porcelain to simulate the gingival tissue. If the lip is short,

and the smile is “gummy”, we will attempt to place gingival colored porcelain in the area to avoid making long or “toothy” appearing restorations.

Impressions - Sending along the polyvinyl siloxane impression is one way to ensure a rapid case return and a more accurate fit. Sometimes a cast or die is chipped, dropped, or otherwise unusable. If the impression is available, we can repour and re wax without waiting, or even pour the solid cast.

Bite registrations - We don't know what happens in the mail, but most often, we receive wax bites that are so distorted, twisted, or bent that they are unusable. If your case has an unstable or difficult to reproduce bite relation, please use a polyvinyl siloxane material. There are several good ones out there (Regisil PB, Blu-mousse, Stat-BR). These remain stable through shipping and can be trimmed as necessary for mounting without distorting.

CASE SUBMISSION CHECKLIST - FIXED

- Master Cast
- Opposing Arch Cast
- GO-BY Cast (if anteriors are restored)
- Photographs / slides if possible for anterior restorations
- Solid Cast
- Polyvinyl siloxane Final Impression
- Bite Registration Record (or Cast Straps if necessary)
- Casts and Impressions Labeled and Disinfected
- Shade for Porcelain Restorations
- Pontic Design for FPDs
- Articulator Settings if necessary
- Completed 2322 with any special instructions

SUPPORTING YOUR MISSION

We understand that some of our customers have either limited or no laboratory support and as a result, the necessary cast work suffers. For those customers, we ask that you send the final impressions to us with the poured master and opposing casts. This is to enable us to pour a solid cast, or otherwise make repours for corrections as necessary. Please contact us for any special circumstances in which we may be of greater service. MSgt Reidy.

NOTES FROM SHIPPING AND RECEIVING

When sending cases to be fabricated, please ensure that the DD Form 2322 is filled out completely. Some areas that are commonly overlooked are : Block #2 - Name of Treatment Facility; #6 - Grade of military member, and #9- Beneficiary Type. These blocks are important for our lab case tracking system.

All removable work, porcelain veneers and Maryland Bridges require two copies of the 2322. Any crowns made

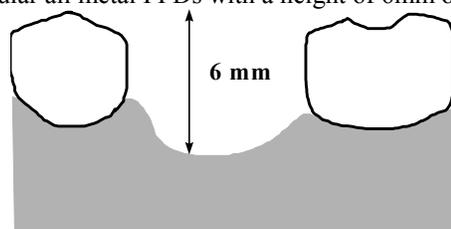
from gold or porcelain fused to metal require three copies of the 2322.

We also would ask you to please refrain from putting tape directly on shipping boxes. This destroys the boxes and causes unnecessary expense to replace them. They should be wrapped in packaging paper which can be taped. An alternative is to secure the box with a strong rubber band. We are interested in what you think. Please send any concerns or suggestions about how we may do business better. Thanks. TSgt Keaton.

FOR THE DOCTORS - INFO PLUS

Pontic design - It is very helpful to us if you could describe the type of pontic you wish to replace missing teeth. Some examples are ridge lap or saddle, modified ridge lap, and hygienic or sanitary. Without instruction, our default positions are:

Mandibular all metal FPDs with a height of 6mm or more



from the occlusal table to gingival contact receive a sanitary pontic.

Mandibular FPDs with height less than 6 mm receive a modified ridge lap.

Maxillary spaces are filled with a modified ridge lap pontic.

Porcelain Occlusals- If a patient presents with immediate disocclusion which permits the posterior to rapidly separate, and prevent lateral rubbing forces, then porcelain occlusion will not be detrimental to the opposing teeth. If however, the patient presents with ‘flattened’ cuspids and a group function with posterior teeth rubbing in excursive movements, then porcelain occlusion may exacerbate wear of the posterior teeth. Examination of the posterior occlusal surfaces on casts will often show facets on teeth that rub in parafunctional excursions. If large facets are present on posterior teeth, porcelain occlusals should be avoided.

Wear of the anterior teeth should also be considered because of their unique role. One generally accepted purpose of the cuspid is to separate the posterior teeth. This action creates the potential for greater wear of the lingual of the maxillary cuspid and the facial of the mandibular cuspid. A metal lingual on the maxillary cuspid can reduce the wear to the mandibular cuspid. If porcelain lingual is considered for the maxillary cuspid, porcelain coverage with a crown, or a porcelain veneer on the mandibular cuspid would place similar materials wearing against each other.

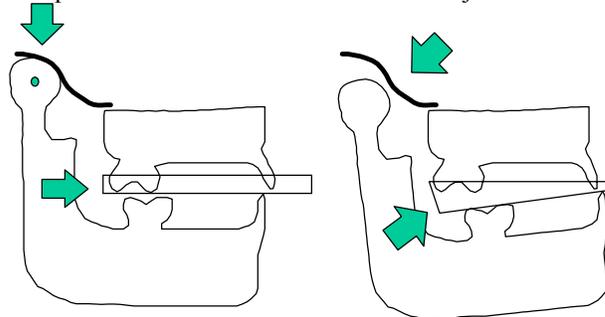
A patient that bruxes however, will wear their teeth, whether they are natural, metal on metal, or porcelain against porcelain. Very often they are not aware of their habit since most parafunctional wear is done at night. Ultimately, these patients are candidates for a maxillary hard acrylic night appliance. Patient compliance is a major determinant for the successful use of this appliance. The bottom line is EACH CASE IS CONSIDERED DIFFERENTLY. Each case presents different wear potential, and consideration should be given for the long term effects of the present treatment plan.

Orthosis - AKA - night guard, bruxism appliance, dental appliance, hard acrylic mouthguard, Orthosis is somewhat of a misnomer because it implies an orthotic or positioning device, when really it simply protects the occlusal surfaces from parafunctional rubbing or wear of the teeth. Any name is OK as long as we can understand what kind of appliance you want. Most patients wear these at night, because studies show *that* is when they most often parafunctionally rub the teeth together.

Since it is desired that the opposing cusp tips are to contact the appliance evenly, it is important to make the appliance with the jaws in the centric relation position. With the appliance in place, occlusal interferences are out of the way. At night, the patients muscles, ligaments, etc. are in 'balance' and the starting point for bruxism is in centric relation. Their initial closure presumably is at this position.

If we make the appliance in this position, the "arch of closure" (jaw swing) will close to the same closing point as when the patient is asleep, and even contacts on the appliance will result. Additionally, your chairside insert time will be less, and the patient's comfort will be good.

If the appliance is made with the bite in maximum intercuspation (MI), the condyles are now down and forward, and the posterior teeth are more apart. This will result in an appliance that is thicker in the posterior. When the patient wears the appliance at night, and closes in centric relation, the teeth will not contact the appliance evenly, resulting in discomfort and usually patient non-compliance. It is often more difficult to adjust chairside.



**Centric Bite on
AXIS and Stable**

**MI Bite off Axis
and Unstable**

The bottom line is we can produce a better appliance if the case is sent with a *Centric Relation* bite record. This can be obtained for example, by use a leaf gauge, two pieces of soft mouthguard material, acrylic wafer, or bimanual manipulation. Often, the leaf gauge is best because it can be used to make bilateral polyvinylsiloxane centric relation bite records while it is in place. Also, by increasing the leaf gauge to the thickness of the proposed orthosis, the lab can obtain the position of the jaw *and* the thickness of the appliance in the same record. This eliminates many "variables" in the appliance fabrication.

If possible, either please send the records at the thickness you desire, or please tell us how thick you would like the appliance. Our default position is to make the appliance about 2mm thick over the posterior teeth.

JOHN J. BOYLE, Jr., LtCol, USAF, DC
Area Dental Laboratory Flight Commander

GARY A. BRAUN, LtCol, USAF, DC

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SEMBACH ADL

INFORMATION UPDATE

Volume 4, Issue 1

Sembach, Germany

15 January 1999

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FROM THE TOP OF THE BENCH

Frohe Weihnachten and Holiday Greetings from your Sembach Area Dental Laboratory. We hope 1998 was a productive year for you and we wish you all the best in 1999. The good news is we are here to serve and help you treat your patients. Productivity at our laboratory continues to be high. However, after experiencing a 25% cut of our working staff, we have ironically experienced a workload increase of 10%. Indeed, like all of us, we are doing more with less. The bad news however, is that sometimes managing our workload has consequences for you. As some of you have recently experienced, a sudden workload increase made it necessary for us to trans-ship your cases. Please be aware that this decision is not taken lightly. In fact, I personally try to contact you when the need arises to inform you of our situation and your options. By utilizing the military ADL system and other bases which are not as busy as the Sembach ADL, we can hopefully return your needed prostheses to you in a shorter time. This is our goal, to provide you and your patients with the best prostheses or appliances possible in the shortest possible time. We continue to thank you for your patience, understanding and support.

Plans are presently being made for our annual spring ADL workshop. This spring's workshop will be held on 27, 28, and 29 April 1999. This is an excellent low cost opportunity for dentists and dental laboratory technicians to receive continuing education in-theater. So mark your calendars now and look for registration packets to arrive in February 1999.

Gary A. Braun, LtCol, USAF, DC
ADL Flight Commander

PLAN FOR ADL WORKSHOP 1999!

Plans have begun for the 1999 Workshop. The date is the 27-29 April. Again this is the Tuesday – Thursday in the

last week in April. This allows the Monday and Friday as travel days.

We hope to provide you with a wide range of interesting topics in dentistry.

Watch for the reservation packages around the end of January 1999.

WE MAY BE CONTACTED BY:

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Gary.Braun@sembach.af.mil - Flight Commander

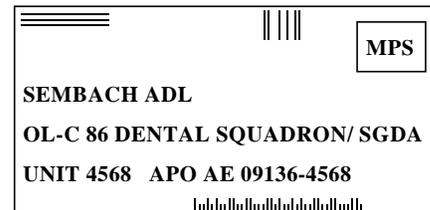
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As many of you know, the workload at the Sembach ADL has got pretty heavy over the last several weeks. As a result of this increased demand, many of your cases are staying in the lab longer than our goal of 20 days. This is a temporary situation.

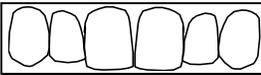
During this time, we'll be sending out email messages to let you know the "projected shipping date" for each of your cases. To make this communication go smoother, we'd like all the dentists who use the Sembach ADL to forward us your email address for our files. Currently, if we don't

have your email address, the messages are being sent out to your clinic commanders or Dentac command function, which isn't always the best way to communicate. You can email your address' directly to me at scott.reidy@sembach.af.mil Thanks for your understanding and continued support.

Scott W. Reidy, MSgt
NCOIC, Sembach ADL

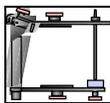


NEW FROM THE LAB



FIXED ELEMENT

Angelina Keaton, TSgt
NCOIC, Fixed Prosthodontic Element



REMOVABLE ELEMENT

We have been spoiled by Santa with presents and commanders allowing so much time off. It's now time to get back to work and that means back to basics. It has been noted that casts are breaking during the deflasking procedures which makes it difficult or impossible to remount after curing. This causes the dental officer to spend a more chair time at insertion. You may refer to the March 98 Newsletter that has a diagram showing the measurements of a cast. Basically, the casts need to be 15 mm thick with a land area of 4 mm and a sulcus depth of 3 mm. Of course these measurements are not set in stone (pardon the pun), ortho casts and such needn't withstand processing, so use your judgement. From an RPD standpoint, it is imperative that the casts are trimmed at 0°. We have received some that have a taper. This taper locks the casts in the hydrocolloid when duplicating, not good. Distortion, tearing and other bad things happen.

If you have questions, please feel free to contact me.

Mark J. Keaton, TSgt
NCOIC Removable Prosthodontic Element



NOTES FROM SHIPPING AND RECEIVING

Please write down our new shipping and receiving email address: Sembach.ADL@sembach.af.mil

If you have any questions regarding your case, this would be a good general address to contact our lab by email.



FOR THE DOCTORS

Because of the decrease in edentulism coupled with the increased use of endosseous implants there is a decline in the number of removable partial dentures we provide for our patients. As we do less of a procedure we have a tendency to get rusty and may forget some of the basics. The purpose of this section is to provide you with some tips to prevent problems with RPD's. It is set up in a do and don't format and covers six fundamental issues in RPD therapy.

Tooth Preparation Concerns:

Do

- A. A comprehensive exam, including articulated casts, radiographs, and intraoral exam.
- B. Replace defective restorations.
- C. Recontour tooth and restored surfaces contacted by the RPD as dictated by the survey

Do Not

- A. Place clasps or rests on defective restorations
- B. Penetrate the dentin when preparing rest seats
- C. Initiate treatment until all other adjunctive care has been addressed.
- D. Undercut rest preparations

Structural Concerns:

Do

- A. Prepare adequate depth for rests and minor connectors crossing the occlusal plane
- B. Prepare guide planes on the axial surfaces of the teeth to allow sufficient bulk for strength without overcontouring
- C. Avoid sharp angle preparations that set up stress points in the metal

Do Not

- A. Overgrind rests to remove occlusal prematurities
- B. Attempt to seat an improperly fitting framework by manual manipulation
- C. Place rests on minor connectors in areas of heavy occlusal function.
- D. Design clasps engaging excessive undercut, or place excessive clasp length into the undercut

Occlusal Concerns:**Do**

- A. Accurately articulate casts and note areas free for framework components.
- B. Prepare rest seats of adequate depth for needed thickness of metal.
- C. Use stabilized bases attached to the framework for maxillomandibular relations

Do Not

- A. Use open retention or mesh for acrylic saddles if there is limited interarch space.
- B. Take final maxillomandibular relations with soft-tissue borne record bases (see C above)

Esthetic Concerns:**Do**

- A. Modify tooth contours to improve unfavorable survey lines.
- B. Avoid use of clasp arms that run mesial to distal in the anterior part of the mouth if possible.
- C. Recontour proximal surfaces to eliminate excess blackout.
- D. Avoid infrabulge retainers on patients with high lip/smile line. (Will display too much metal – consider instead a circumferential clasp or a twin flex clasp).
- E. Use acrylic teeth of the same gingivo-occlusal dimension as the adjacent natural teeth.
- F. Grind acrylic teeth and proximal minor connectors to allow for placement of artificial teeth in intimate contact with the adjacent natural teeth.

Do Not

- A. Use acrylic teeth that are too short or too long gingivo-occlusally.
- B. Have pink acrylic visible between natural teeth and denture teeth.
- C. Use a labial flange in narrow anterior edentulous areas.
- D. Extend the design for open retention or mesh so far labially that it interferes with the setting the denture teeth (also of concern is the placement of struts in open retention).
- E. Rely on the laboratory technician to determine anterior tooth selection arrangement without some esthetic guidance.

Accuracy of Fit:**Do**

- A. Modify stock trays to allow for uniform thickness of impression materials.
- B. Use approved impression materials with the proper adhesive to insure stability in the tray
- C. Properly mix impression materials and gypsum products.

- D. Pour impressions immediately after rinsing and disinfection.
- E. Be sure casts are free of stone nodules, bubbles, slurry deposits, etc.

Do Not

- A. Use custom acrylic trays that have not set for less than 9 hours (Triad trays are a good alternative if you are in a hurry)
- B. Remove the impression before it is completely set.
- C. Attempt to readapt the impression material to the tray if it has pulled away.
- D. Use an impression if the tray has made contact with teeth or soft tissues.
- E. Allow a poured impression to set against a gypsum product longer than the manufacturer's recommended time (esp. hydrocolloid).

Preservation of the Periodontium:

Do

- A. Design clasps so that all the functional forces on abutment teeth are reciprocated.
- B. Use maximum coverage of denture bearing areas for support.
- C. Avoid impingement of marginal gingival tissues and be sure to cross the marginal gingivae only at right angles.
- D. Insure rigidity of the framework for stress distribution

Do Not

- A. Clasp the "lone standing" bicuspid if possible
- B. Clasp any tooth with a guarded or poor periodontal prognosis.
- C. Place clasp arms of suprabulge clasps within 1-2 mm of the marginal gingivae.

Congratulations

Kudos to the following outstanding performers in the most recent quarterly awards for the 86th Dental Squadron. The ADL continues to shine!

MSgt Scott Reidy - Senior NCO

SSgt Wes Schlauch - NCO

James Coleman – Civilian

Beate Steinbacher - Local National

GARY A. BRAUN, LtCol, USAF, DC
Area Dental Laboratory Flight Commander

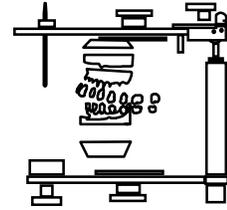
WILLIAM DINSE, Maj, USAF, DC

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Sembach ADL Information Update



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Sembach, Germany

15 April 1999

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FROM THE TOP OF THE BENCH

Springtime greetings from the men and women of the Sembach Area Dental Laboratory. We hope you enjoy your Easter or Spring Break vacations. With the springtime comes new growth and development. We too at the ADL are looking to grow in experience and knowledge. From your requests, we recently looked at the possibility of introducing compomers, a laser welder and Empress crowns into our laboratory. We are exploring the uses of acrylic bonded to metal products such as Artglass®, Zeta® or Targis® systems. We worked with Zeta® from Vita Corporation and are planning a trip to Ivocap to see the Targis® system. The results of our findings should help us decide if we will use these products in the near future. Laser welders are currently being used by some dental laboratories. However, after using a laser welder for a trial basis, we have decided that the present high cost exceeds our need at this time. The Empress System, which uses an injectable ceramic, has been requested by some providers. We are investigating the possible demand versus cost for this system here in Europe. Presently Empress crowns can be sent to Lackland AFB, TX, for fabrication. For the future, please continue to keep us informed of your needs so that we can continue to support your patient treatment.

Our productivity continues to remain high. Unfortunately, our turn around times are increasing due to the high caseload we are experiencing. We ask for your patience, as we continue to make high quality dental appliances and prostheses for you in the shortest time. If you have any questions regarding your cases, please do not hesitate to contact our shipping and receiving, or me personally by phone or email. We are here for you and your patients.

Gary A. Braun, LtCol, USAF, DC
ADL Flight Commander

WE MAY BE CONTACTED BY:

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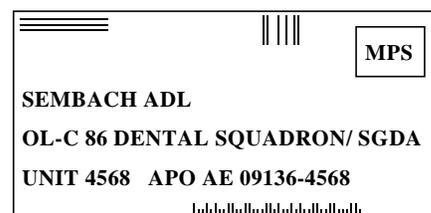
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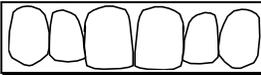
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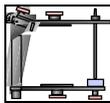


FIXED ELEMENT

Although we receive a high percentage of excellent comments on our feedback forms, we know there is always room for improvement. One way we can improve our services to both you and the patient is to give you exactly what you want. That is difficult to do with the little bit of information we usually receive. Most often, we receive 2322's with only the basic patient information and a shade number. We could better serve you if we had specific instructions on the cutback and collar design (porcelain collar, metal collar, or vanishing margin) as a minimum. On cases where we don't receive specific instructions, we make a decision based on the information that we have and hope it meets your approval. Some of you are sending photos, which are helpful but there is still missing information, such as does the patient want exactly what they had or should we improve slight imperfections? Please help us help you by using the space on the 2322 to design the prostheses.

Thank you

Angelina Keaton, MSgt
NCOIC, Fixed Prosthodontic Element



REMOVABLE ELEMENT

This is my last input for the Sembach ADL Newsletter as I am embarking to another foreign country. My frau and I are headed to Lackland AFB in sunny Texas. I have enjoyed the challenges of working here and am looking forward to new ones when I get there.

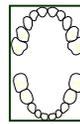
TSgt Patrick Coon will be taking my job as the NCOIC of the Removable Element. Any questions about removable appliances can now be directed to him. You can also contact Mr. James Coleman concerning RPD frameworks. They are very knowledgeable and are anxious to help you with your removable prosthodontic cases.

Mark J. Keaton, TSgt
NCOIC Removable Prosthodontic Element



NOTES FROM SHIPPING AND RECEIVING

Please make sure the name, address, and phone number of the sending base is clearly printed at the top of the DD form 2322. Also include the doctor's name. Please don't place tape directly on shipping boxes. Wrap boxes in paper, then tape them securely. To save time, use our e-mail to check the status of your case. See the shipping and receiving address above or contact: Shelley.murray@sembach.af.mil



FOR THE TECHNICIANS

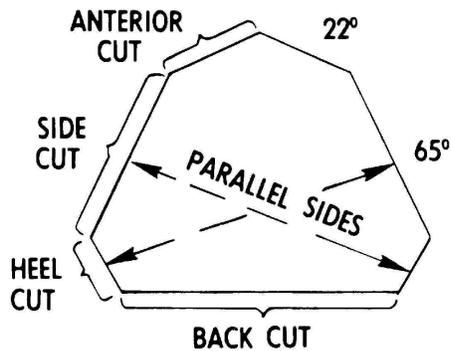
Orthodontic Models

We have received a number of requests for trimmed orthodontic casts. In order to decrease our turn around times, we ask that local laboratories assist us by doing as much of this work as possible. We have included excerpts from the basic technique from AFP 162-6 Vol III p208-211.

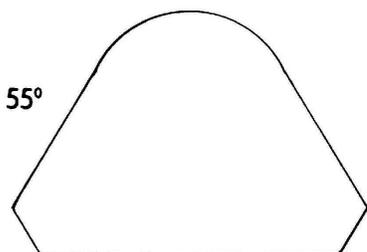
Trimming and Finishing Procedures:

1. Pour impressions in plaster or dental stone as directed by the dentist.
2. Carefully remove excess material from the heels of the mandibular cast with a plaster knife until the incisors and terminal molars can be made to touch simultaneously.
3. Place the mandibular cast on the cast trimmer. Stand the cast on its heels with the occlusal plane contacting a right angle guide plate. Direct the bottom of the cast toward the trimming wheel. Place a folded damp paper towel between the guide plate and the stone teeth to reduce the possibility of chipping.
4. Trim the bottom of the mandibular cast until it is parallel with the occlusal plane.
5. Remove the right angle guide plate and position the cast on the trimming table so the back of the cast can be trimmed.
6. Trim the back part leaving 12 mm of cast substance distal to the terminal molar. If it is a

- class III malocclusion case, or if the maxillary second molars are erupted and the mandibular ones are not, more than 12 mm can be left behind the terminal molar on the mandibular cast. When the quadrants of a mandibular cast are symmetrical, draw a line down the midline of the arch to the back of the cast. Trim the back of the cast at right angles to this line, leaving more behind one molar than another.
7. Place the maxillary cast in occlusion with the trimmed mandibular cast. The dentist may have supplied an interocclusal record for this purpose. If needed, trim some plaster from the heels of the maxillary cast to get the upper and lower casts together.
 8. With the casts in occlusion, place the base of the mandibular cast on the trimming table with the back toward the wheel. Trim the maxillary cast until the grinding wheel just touches the back of the mandibular cast. This should allow the casts to be placed on their backs on a flat surface and remain in occlusion. Finish this area on a fine grit wheel.
 9. With the casts sitting on their backs in occlusion, and using the right angle guide, trim the top of the maxillary cast until it is parallel to the bottom of the mandibular cast.
 10. Place the back of the cast against the angulator guide and trim one side of the deepest part of the mucobuccal fold. Repeat this for the other side. The angulation for the mandibular cast is 55°.
 11. Place the angulator guide next to the shield of the cast trimmer and trim the heels to 6 mm distance from the distobuccal cusp of the terminal molar. The heels should be equal in length.
 12. Trim the front of the mandibular cast parallel to the back. Trim this surface until the depth of the fold in the central incisor area is reached. Round the corners to obtain an evenly rounded symmetrical front. This is usually done without any guides.
 13. Repeat steps 10 through 12 using the fine grit wheel.
 14. Place the back of the maxillary cast against the angular guide and trim one side to the deepest part of the mucobuccal fold. The angulation for maxillary casts is 65°.
 15. Place the angular guide next to the shield of the cast trimmer and trim the heels to 6 mm distance from the distobuccal cusp of the terminal molar. Make the heels equal in length.
 16. Trim the front of the maxillary cast using the angulator guide set at 22°. The right and left portions of the front should be equal in length. Trim this area until the trimmer wheel is 3-6 mm from the central incisors. Use caution during this procedure (to avoid abrading the incisor teeth).
 17. Repeat steps 14-16 using the fine grit wheel.
 18. Place the casts in occlusion and check height. They should measure 60 to 75 mm overall. If they are higher than this, trim both the maxillary and mandibular casts using the right angle guide plate. The width of the land areas should be balanced. Use a fine grit wheel for finishing. If a standard height is desired, 62 mm is suggested.
 19. After establishing correct height and proper trim, rinse the casts under running water. Use a soft toothbrush on the anatomical portion to remove any slurry left from the trimming process. To remove any blobs of material, use a rounded scraper in the mucobuccal fold area and a sharp instrument around the teeth.
 20. Use the finest grained wet-dry sandpaper on a glass slab to remove the cast trimmer marks. Do this under running water, holding the surface of the cast firmly against perfectly flat sandpaper.
 21. Let the cast dry overnight. Fill holes with dry plaster or stone. Add water using a camel hair brush. After the holes are filled, allow the casts to dry thoroughly before stoning or sanding. Use a minimum of water during the stoning or sanding. Dip the cast in water and rub dry. Wipe the residue away.
 22. If needed, repeat all of the above to produce an acceptable cast.
 23. After the cast is free of holes and scratches, dry it thoroughly.
 24. Place the patient's name and the date printed on gummed labels on the base of the maxillary and mandibular casts. If a cast-marking machine is available, use it instead.
 25. Place the casts in liquid soap for 30-45 minutes. Remove from the soap and rinse under running water until all excess soap is removed. Polish the casts with a slightly damp cloth, paper towel or dry chamois and rub to a high gloss.



MAXILLARY



MANDIBULAR

Please also note that some casts defy the return of a good product.



Some bite registration material is so brittle, that many times it is received broken in shipment.



If you receive casts like these, it may be best to ask the provider to trim some of the excess for you, or perhaps make new impressions. Notice the palate is grossly filled with material and the distal portions of the molars are missing



Removable Partial Dentures

Because of the decrease in edentulism coupled with the increased use of endosseous implants there is a decline in the number of removable partial dentures we provide for our patients. As we do less of a procedure we have a tendency to get rusty and may forget some of the basics. The purpose of this section is to provide you with some tips to prevent problems with RPD's. It is set up in a "do" and "do not" format and covers some fundamental issues in RPD therapy. This is the second of a two part series and will cover esthetic concerns, accuracy of fit, and preservation of the periodontium. In the last newsletter we reviewed tooth preparation, structural, and occlusion concerns.

Do . .

- A. Modify tooth contours to improve unfavorable survey lines.
- B. Recontour proximal surfaces to eliminate excess blockout.

- C. Modify stock trays to allow for uniform thickness of impression materials.
 - D. Use approved impression materials with the proper adhesive to insure stability in the tray.
 - E. Properly mix impression materials and gypsum products.
 - F. Make a “closed mouth” impression for mandibular RPD’s. This action prevents recording the flexure of the mandible.
 - G. Pour alginate impressions immediately after rinsing and disinfection.
 - H. Be sure casts are free of stone nodules, bubbles, and slurry deposits.
 - I. Use acrylic teeth of the same gingivo-occlusal dimension as the adjacent natural teeth.
 - J. Grind acrylic teeth and proximal minor connectors to allow for placement of artificial teeth in intimate contact with the adjacent natural teeth.
 - K. Design clasps so that all the functional forces on abutment teeth are reciprocated.
 - L. Use maximum coverage of denture bearing areas for support.
 - M. Be sure to cross the marginal gingiva only at right angles with the framework.
 - N. Insure rigidity of the framework to provide equitable stress distribution.
- H. Use a labial flange in narrow anterior edentulous areas.
 - I. Extend the design for open retention or mesh so far labially that it interferes with setting the denture teeth.
 - J. Rely on the laboratory technician to determine anterior tooth selection and arrangement without some esthetic guidance. Instead, use go-by casts photos or slides.
 - K. Use acrylic for major connectors.
 - L. Clasp the “lone standing” bicuspid if possible.
 - M. Clasp any tooth with a guarded or poor periodontal prognosis.
 - N. Place a suprabulge clasp closer than 1mm to the marginal gingiva.

We hope these tips help you in your pursuit of excellent RPDs.

CONGRATULATIONS:

LtCol Braun was selected for Colonel in the last promotion board. SSgt Christudoss will pin on TSgt on 3 May.

HAIL AND FAREWELL:

Do not . .

- A. Use custom acrylic trays that have not set for less than 24 hours. Use triad trays if you are in a time crunch.
- B. Remove the impression before it is completely set. (This seems like common sense, but know the setting times for your materials).
- C. Attempt to readapt the impression material to the tray if it has pulled away.
- D. Use an impression if the tray has made contact with teeth or soft tissues.
- E. Allow a poured impression to set against a gypsum product longer than the manufacturer’s recommended time (especially hydrocolloid).
- F. Use acrylic teeth that are too short or too long gingivo-occlusally.
- G. Have pink acrylic visible between natural teeth and denture teeth.



SSgt Reim, SrA Crowell
SrA Goode, SSgt Low

The ADL would like to welcome our four newest members. SSgt Tim Reim, coming to us from Sheppard AFB, SrA Edward Crowell from Dover AFB, SSgt Darren Low from Peterson AFB, and SrA Michael Goode from Keesler AFB. Unfortunately, we must say good-bye to SSgt Alex Fuentes. He has been accepted for Palace Chase and will be joining the Air National Guard in Massachusetts. We will miss him and wish him good luck in his civilian life! Mr Dave Bates has accepted a laboratory position in Texas. He has been a solid performer with our ADL in Germany since 1985. We wish him well in the Lone Star State.

Linette L. Baker, SMSgt
Superintendent, Sembach Dental Services

SAFETY TIP:

A recent article describes the potential harmful sounds generated by high speed handpieces and ultrasonic scalers. Protect your hearing by using appropriate hearing protection. Noise-induced hearing loss is not a treatable condition – prevention is key! (Setcos and Mahyuddin, Int J of Prosthodontics, March/April 1998)

GARY A. BRAUN, LtCol, USAF, DC
Area Dental Laboratory Flight Commander

WILLIAM E. DINSE, Maj, USAF, DC

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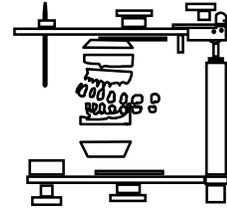
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ADL Naval Dental Center, SW

ADL Ft. Gordon, GA



Sembach ADL Information Update



Volume 4, Issue 3

Sembach, Germany

15 July 1999

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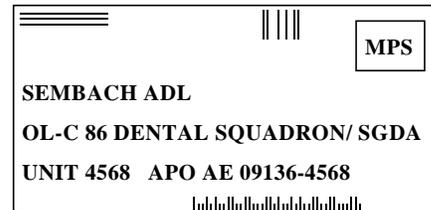
Patrick.Coon@sembach.af.mil Chief Removable Element

FROM THE TOP OF THE BENCH

Summer greetings from the men and women of the Sembach Area Dental Laboratory. Hopefully you have had time to enjoy the warm weather we have been having here in Germany. Perhaps you are just coming to Europe. We would extend a hearty warm welcome to you and invite you to use our laboratory services. Among other services, we can now provide the fitting of implant restorations by use of an "electronic discharge machine," or EDM. Information on these applications will be included in the next newsletter. Call or email us for a complete listing of our services.

We recently have developed a new program to track our mission goal. Our goal is to return 90% of our cases to the providers within 20 days. So far, with a decrease in caseload for the summer, we are approaching that goal in our removable acrylic and fixed sections. If you send me your email address, I will periodically update you with our laboratory turn around times to help you plan patient appointments. Please call us if there is anything we can do to serve you better. Enjoy your tour in Europe

Gary A. Braun, LtCol, USAF, DC
ADL Flight Commander



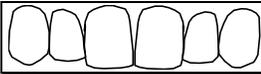
DSN: 496-6530 / 7733 COMM: 06302-67-6530 / 7733
DSN FAX: 496-6245 COMM FAX: 06302 -67-6245

ADL Workshop Was a Success:

The 3rd annual tri-service workshop provided an excellent opportunity for information exchange. Thanks again to all the lecturers, hands on course presenters and companies for making it a big success. If you missed it, plan on attending in May 2000. It will no doubt be the best one yet!

Swiss Master Ceramist Vanik Jinoian





FIXED ELEMENT

At last we've achieved room to breathe! Our caseload is now back down to manageable levels, and cases are moving quickly through the section. Many thanks to all our customers who were so patient during our time of backlog.

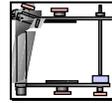
In an effort to serve you better, below is some information that will allow you to help us, so that we can provide the best prosthesis in the most efficient manner: To ensure accurate interproximal contacts, please send a *solid cast*. If that's not possible, please send the *impression*, and we'll pour a solid cast.

While we appreciate receiving cases already mounted on an articulator (saves us a step!), it is very difficult for us if we receive more than one case mounted on the same articulator. Our Fixed Element is divided into sections, and we work using an assembly-line process. It becomes somewhat of a nightmare to ensure that all cases on that particular articulator proceed through the system together. To assist us with this problem, we ask that you send the case with witness lines, or a polyvinyl bite registration. Here at the ADL we currently have Hanau articulator models H2, 183, and H-mates. The WhipMix models we have are the 2240 and 8500. If you prefer a certain model, by all means request it!

When basing casts, please provide a complete base. When we receive casts with an unfilled tongue space/palate, or only retention nodules, we must then base the casts before mounting on the articulator. Yes, it's something small, but it does add up when working in 'production mode'.

We take pride in our work; any additional information you include on the 2322, such as collar design, shade characterization, suggested improvements over existing dentition helps us to give you, and the patient, the best possible prosthesis.

Esther Lewis, TSgt
Fixed Prosthodontic Element Chief



REMOVABLE ELEMENT

Turn-around times are dropping and most of our cases leave in less than 20 days, but a few of our more difficult cases are still taking longer than 20 days.

When sending in cases for RPD's, please be sure to send us good casts with adequate vestibules and land areas. These will ensure that we can follow your designs. Speaking of designs, please show us on a design cast what you would like us to produce. A drawing on the 2322 gives us an idea of what you would like, but a 2 dimensional representation on a cast says it all and answers most of our questions.

Recently we have received a few cases with the tripod marks on the outside of the base or the soft tissues areas in the vestibules. These are often unreproducible areas because after duplication, the cast base will be trimmed to fit in a flask, for example. The option in these cases is to either return the case to the provider or survey it ourselves. If we return the case, it will incur an increased time for the patient. If we survey ourselves, we may not achieve the same tilt as when you designed the case. So to avoid confusion it is best to make the tripod marks on either hard tissue or attached gingiva, and preferably off the drawn design of the partial if possible,.

In acrylic we can work with most any cast, but we recently received a cast that was trimmed part way up the posterior residual ridge. We were requested to make a transitional RPD. The result, however was less than optimal. So if possible, please give us a cast with all the appropriate landmarks.

I look forward to working with all our customers, dentists and technicians alike. If you have any questions, please feel free to call me or Mr. Coleman and we'll be happy to discuss any cases with you.

Patrick Coon, TSgt
Chief, Removable Prosthodontic Element



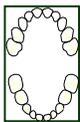
NOTES FROM SHIPPING AND RECEIVING

As some of you may have noticed you have been receiving crowns wrapped in gauze and taped, and cases sent in all kinds of different boxes. This is because we have been running short of these things. So if you have pill bottles coming out of your ears and boxes you don't know what to do with please send them our way! We'll take them off of your hands.

PLEASE, PLEASE, PLEASE fill out block two of the 2322 **completely**. If you notice it asks for name of treatment facility, mailing address and autovon number. Here at the ADL we see many cases come in and out each day and by having block two completely filled out it makes our job at shipping & receiving a little easier and also insures your case is returned to you promptly.

Thanks for your attention to these matters.

SrA Shelley R. Murray
Shipping & Receiving



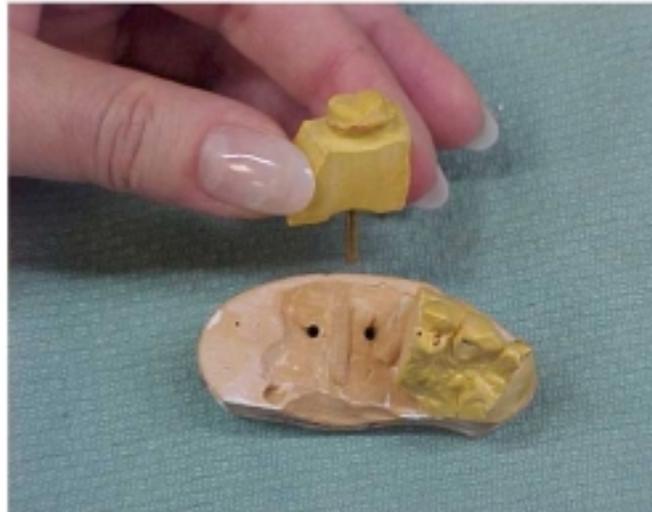
FOR THE TECHNICIANS

One of the most important things to remember when fabricating working casts with removable dies is that the accuracy of the cast is going to be reflected in the amount of chairside time required to insert the crown or fixed partial denture. I'd like to mention some of the problems we see at the ADL and offer some suggestions on how to increase die stability.

On several occasions, dies are sent that are too long. Stability can be increased if the dies are **no longer than 10mm to 13 mm from the margin to the base**.

When dual pinning (for those of you who have the Pindex system) ensure the holes are drilled completely and not too close to the margins. When cementing the pins in place, use enough cyanoacrylate. Often times the pins just drop out of the dies or stay in the base when the dies are removed. Avoid using excess glue as well. Use a long and short pin and please use sleeves. Many casts we receive are fabricated with only short pins. This requires the technician to force the die off the

base, often times chipping margins or cracking the die.



This master die pictured above has only one *round* pin and although there are some grooves in the cast, the die rotated freely on the cast. If you are limited to one pin, use the flat sided pins and adapt the stone well to the pin.

For those of you who don't have Pindex systems, providing adequate anti-rotational grooves can increase stability. About one half the diameter of a #8 round carbide bur is sufficient. Ensuring there's no undercuts in the grooves, using adequate lubrication such as Kerr's Super Sep (not petrolatum or wax), and allowing the base to set for at least an hour will ensure the base won't break off in the grooves.

Scott Reidy, MSgt



FOR THE DOCTORS

New QC Forms:

You will notice that we have redesigned our QC forms. Please spend an extra minute to give us feedback about the product you have received. We do respond to your comments.

PROSTHODONTIC PEARL

Two Cord Technique For Fixed Prosthodontic Impressions:

Obtaining a good impression is key to receiving an excellent final result. Dr Kenneth Rudd's pithy saying: "What is the most important step in prosthodontics? The one you are currently on." holds true especially here.

- 1) After breaking interproximal contacts, Gently pack 000 black Ultrapak® cord (Ultradent). Don't soak in hemostatic agent because the cord will be in the sulcus for longer than 5-10 minutes. If none is available use 4-0 silk suture. Packing this first cord does three things for you: it helps you visualize the depth of the sulcus thereby aiding in margin placement, it provides an absorbent layer to prevent bleeding upon retraction cord removal, and it helps remove your temporary luting cement at the end of the appointment.
- 2) Finish the preparation.
- 3) Make your provisional at this point if you are using the direct technique.
- 4) Control any bleeding with ferric sulfate solution. I use Astringedent ® (Ultradent).
- 5) Pack cord moistened with conventional buffered hemostatic agent. I use Hemodent (Premier Dental Products). Finesse the cord into place, too much force will damage the gingiva and potentially jeopardize the longevity of your restoration. Leave the cord in place for 10 minutes. I place a folded 4x4 gauze in the patient's mouth to keep the area dry while letting the patient relax.
- 6) Moisten the cord with a mist of water and remove the cord very gently. If you forget this step you will very likely tear the delicate sulcular epithelium and cause bleeding.
- 7) Gently dry the teeth with a stream of air.
- 8) At this point, be sure there is no bleeding. If the gingiva is bleeding control with an Astringedent applicator. Although you are anxious to impress, don't do it if there is any bleeding. Your odds of getting a good impression are significantly reduced!
- 9) Have your assistant load the tray with either a heavy or medium body polyvinylsiloxane impression material.

- 10) In a dry field, inject the light body material around the teeth. Blow a gentle stream of air to force the impression material into the gingival sulcus and into grooves and boxes.
- 11) Apply another layer of light body impression material around the prep(s). Also extend your light body impression material to the other teeth in the arch. This will ensure that the other occlusal surfaces are accurately recorded.
- 12) If doing the indirect technique, pour a slurry cast and make your provisional.
- 13) Cement your provisional.
- 14) Remove the 000 black cord.

William E. Dinse DMD,MS

CONGRATULATIONS:

Dr William Dinse pinned on LtCol in May.

HAIL AND FAREWELL:

Sadly we had to say goodbye to several wonderful people since our last newsletter. SMgt Linette Baker moved just next door to Ramstein AFB where she will assume the job of Superintendent of Clinical Flight. MSgt Angie Keaton and MSgt(sel) Mark Keaton left for Texas. They will be working at Lackland AFB and enjoying all that wonderful Tex-Mex food. MSgt Scott Reidy left for McChord AFB in Washington state. Their contributions to the ADL were too numerous to list here.

A warm welcome is extended to SrA Christine Kahn. She hails from Nellis AFB in Nevada. SrA Kevin Krumm has joined us from San Antonio Texas (Lackland AFB).



Welcome to Deutschland SrA Kahn and Krum !
SAFETY TIP:

Don't forget to don protective gloves and masks
when handling hazardous chemicals.

GARY A. BRAUN, LtCol, USAF, DC
Area Dental Laboratory Flight Commander

WILLIAM E. DINSE, LtCol, USAF, DC

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Sembach ADL Information Update



Volume 4, Issue 4

Sembach, Germany

15 November 1999

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FROM THE TOP OF THE BENCH

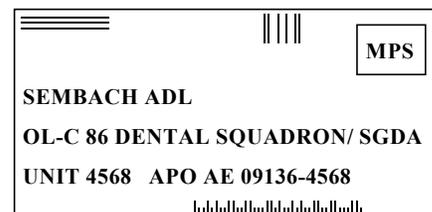
Hearty "Herbst" greetings from the men and women of the Sembach Area Dental laboratory! Just to keep you updated, our Electronic Discharge Machine is now operational. This machine is used to create a closer, passive fit of the restorative abutment to the implant interface. By increasing the possibility of a passive fit, the problem of broken or loose screws is decreased. We have included more information about the EDM process in this newsletter.

Our workload for the past two months has been steady. We have returned over 90% of our cases to our providers within 20 days. This is our new goal. If we can return the case to you within 20 days, we feel we are meeting your needs. Let us know what you think. Please fill out and return the Quality Control sheets that accompany your case. These enable us to track the quality and timeliness of our product.

Please call or email us if you have any questions regarding your case, our products, or turnaround times. We are here for you and your patients.

Thanks for your continuing support, and have a great holiday season.

GARY A. BRAUN, LtCol, USAF, DC
Area Dental Laboratory Flight Commander



DSN: 496-6530 / 7733 COMM: 06302-67-6530 / 7733
DSN FAX: 496-6245 COMM FAX: 06302 -67-6245

FIXED ELEMENT

Some tips to help us help you get a better prosthesis....

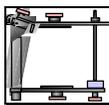
If sending a case to us to pindex, please just send the *impression* and we will take it from there. Otherwise, just send the initial pour **without a base**. It will save both of us lots of time! For all fixed cases, an *impression* is always welcome! Poured casts from your impression help us ascertain interproximal

contacts, and acts as a back-up in case of an accident. Please try to double-pin all dies, and ensure that they're no taller than 15 mm; the taller the die, the better the chance for mobility (and inaccurate prostheses).

A reminder for InCeram/Spinell cases: die spacer is **NOT** required when submitting cases.

As always, if you have any questions, please feel free to contact us! We have a knowledgeable, friendly staff, willing to help you provide the best treatment for your patients.

Esther Lewis, TSgt
Fixed Prosthodontic Element Chief



REMOVABLE ELEMENT

We have been receiving a few cases where the orthodontic bands are not fully seated on the teeth on the cast. This will give a poor clinical result. Please ensure that the bands are fully seated on your patients's teeth before making the impression. Then inspect the impression before and after the pour to be sure the bands are where you want them.

Please base your casts. This makes it easier for us to process your appliances. Thank you.

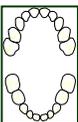
Patrick Coon, TSgt
Chief, Removable Prosthodontic Element



NOTES FROM SHIPPING AND RECEIVING

Don't forget to include your phone number and e-mail address (if you have one) in block 2 on the DD form 2322.

SrA Shelley R. Murray
Shipping & Receiving



FOR THE TECHNICIANS

We sent out a survey to determine if there was any interest in taking the CDT comprehensive portion at our next ADL workshop. So far we have received 3 requests. If you are interested, we would like to hear from you. The point of contact is SSgt Timothy Reim. Timothy.Reim@sembach.af.mil

OCCLUSAL DEVICES

We get many requests for hard acrylic night guards. These prostheses have been called night guards, mandibular stabilization appliances (MSA's), mandibular stabilization prostheses, orthoses, and hard night guards. According to the Glossary of Prosthodontic Terms, the correct name for these appliances is the **occlusal device**.

There are various ways to fabricate occlusal devices. At the ADL we usually wax up our appliances and process them with the Ivocap system. Another technique we occasionally use is the sprinkle-on method. This is handy if you don't have the Ivocap system or you don't want to do conventional processing. What follows is a description of the classic sprinkle-on technique for occlusal device fabrication.

Materials:

- Roll wax
- Alginate Separating Material (Alcote)
- Clear auto-polymerizing acrylic resin
- Red pencil
- Articulating paper forceps and paper
- Shim stock
- Acrylic trimming burs
- Vaseline
- Assorted polishing wheels
- Flour pumice, tripoli and hi-shine compounds

Procedure:

1. Scrutinize the quality of the cast and eliminate all nodules.
2. Design the proposed occlusal device.
3. Mount the casts on a semi-adjustable articulator with face bow and occlusal records if available.
4. If no records are available, mount the casts in MIP and open the pin so there is about 1 mm of clearance between the most posterior molars.
5. Block-out (0°) master cast and establish borders with roll wax.
6. Apply alginate separator.
7. Apply clear orthodontic acrylic resin in the following sprinkle-on fashion:
 - a. Lingual, occlusal, and buccal posterior – do one side, then cure under a rubber bowl or in a plastic bag.
 - b. Lingual, occlusal, and buccal posterior – other side, cure as above.
 - c. Create the anterior section and join it to the posterior sections. The pin should contact the

- guide table with NO tooth contact. Cure as above.
- d. Lubricate the opposing cast with Vaseline. Apply resin to one posterior section, close the articulator and register the cusps of the opposing cast.
 - e. Mark the greatest depth of the cusp indentation with the red pencil.
 - f. Trim away the resin. Remove all but the deepest pencil marks. Verify that you still have contacts with shim stock.
 - g. Repeat steps d, e, and f on the opposite side.
 - h. Add resin as in steps d through f to the anterior section. Make centric, lateral, and protrusive indentations.
8. Develop minimal disclusion using the mandibular cuspids in right and left lateral excursions, as well as protrusive movements. There should be no contact of the mandibular posterior teeth except in centric occlusion. In most cases the mandibular buccal stamp cusps should hold shim stock. Shim stock should drag on the anterior teeth in centric occlusion.
 9. Trim the prosthesis to about 1 mm of thickness before removing it from cast.
 10. Remove the prosthesis from the cast. Trim the borders, polish and hi-shine the prosthesis.
 11. Note: if you want to save some time fabricating an occlusal device, you can modify the classic technique by sprinkling the entire base (out of occlusion), allowing it to cure. Next, develop the occlusion in two steps: 1. sprinkle both posterior quadrants, close the articulator, 2. Sprinkle the anterior section, run through the excursions. Proceed with steps 7-9. This modification can potentially result in excessive polymerization shrinkage and a prosthesis that rocks in the patients' mouth however, many technicians do this modification and tell me that they have no problems with distortion.

As with any lab procedure, attention to detail is key. What works for one person may not work for another. Remember the old adage: "There's never enough time to do it right the first time but there's always time to do it over again".

"It's a funny thing about life: If you refuse to accept anything but the best, you very often get it." W. Somerset Maughan



Prosthodontic Pearl: Occlusal Reduction

Occasionally we receive cases where there is inadequate occlusal reduction for proper crown fabrication. This is especially true for posterior teeth with the request for metal-ceramic and all porcelain occlusion.

One technique you can use to ensure adequate reduction is to make what is called a "spider preparation". The depth of a 330 bur is 1.5 mm. Run this bur at complete depth through the occlusal grooves to establish depth cuts. Then finish your occlusal reduction with a football diamond to the depth cuts. By the time you are done smoothing the occlusal surface, you should have the required 2.0-mm reduction required for a metal ceramic restoration. If you are making a survey crown, compensate for the rest seat in your preparation. By providing enough room for materials you allow the technician to develop realistic occlusal anatomy.

ELECTRIC DISCHARGE MACHINING



Figure 1. Electric Discharge Machine

We recently installed an electric discharge machine at the ADL (Fig 1). If this is the first you've heard of electric discharge machining or EDM, it is a process that has been used for industrial applications since the 1930's. It was once used mainly for thread tapping but now it is used to fabricate sophisticated molds to manufacture things such as automobile parts and golf balls. EDM has been adapted to dental laboratory technology only within the past decade.

Some of the pioneering research has been done at Wilford Hall Medical Center, Department of Prosthodontics, San Antonio, Texas.



Fig 1. Copper Electrode for a standard abutment

EDM is a simple process. The basic components are the restoration or prosthesis (referred to as workpiece in the industry), an electrode or the implant analog (in a stone patty), a tank of dielectric fluid, and a power source. The prostheses and electrode (copper implant analog- Fig 1) are connected to an adjustable power source. The machine precisely regulates the amount of metal removal by “sparking” a current across the gap between the prosthesis and electrode.

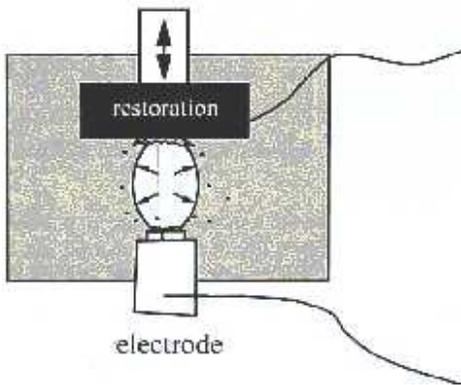


Figure 2. From Tel Med EDM Owner’s manual, used with permission.

Figure 2 is a basic diagram of a dental restoration being machined. An electric potential is generated across the space between the electrode and the restoration. As heat builds up and vaporizes the fluid to form a bubble, sparks jump between the electrode and restoration, generating intense heat, which in turn vaporizes the metal.

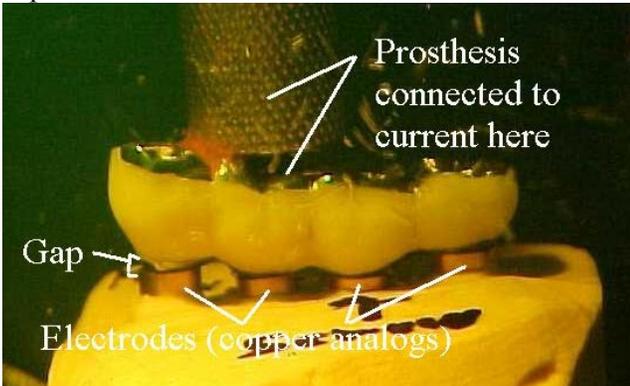


Fig 3. Close up of EDM process with components.

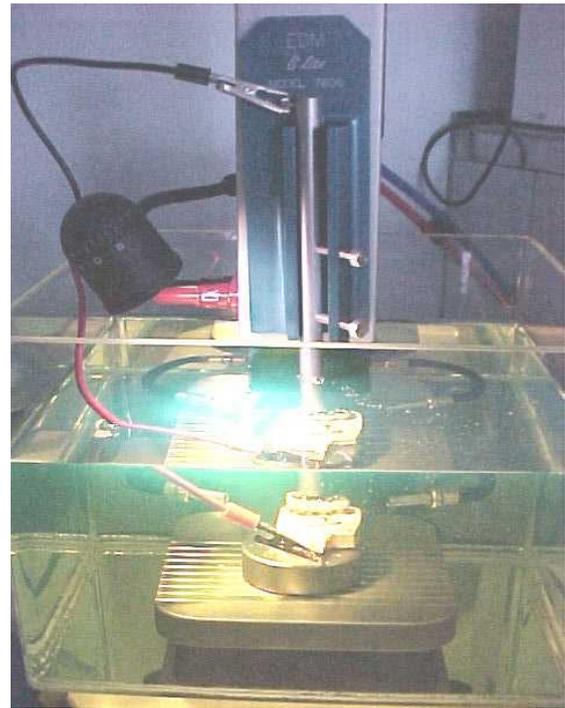


Figure 4. Restoration being machined. Tel Med

In dentistry this process has been used to make precision attachments, titanium crowns, titanium and gold implant retained prostheses, and telescopic crowns. Presently, the ADL will use the EDM process for implant applications.

The cast metal framework of many prostheses often does not fit passively on the implants. It is important that an implant restoration fit passively. Uneven and torquing forces on the implant restoration cause loosening or breaking of the retaining screws. Using EDM technology creates a passive fit of the prosthesis by correcting the cast framework inaccuracies (Fig 5). This is better than soldering for three reasons: 1) the resultant framework is stronger 2) soldering typically requires another patient visit plus extra laboratory time and 3) Unlike soldering, an EDM correction obviates the need to remove the porcelain or resin veneer material because the heat is confined only to the metal removed; thus time, labor, and materials are saved.

EDM can also correct casting irregularities sometimes encountered with UCLA type multiple or single implant abutments (Fig 6).



Fig 5. Before EDM - note rough implant interface



Fig 6. After electronic discharge machining – note smooth implant interface surface
In addition, EDM is also very useful for removing gold overflow from “cast-to” implant gold cylinders.

To use the EDM with your cases, call us and we can give you the specifics for your particular situation. For further reading, refer to J Pros Dent 1997:212-5 and J Pros Dent 1995;73:280-3.

Electric discharge machining is a welcome addition to our lab and will help us in our continual pursuit of giving you the very best dental laboratory prostheses.

New QC Forms:

You will notice that we have redesigned our QC forms. Please spend an extra minute to give us feedback about the product you have received. It also helps us to track fabrication trends. We do respond to your comments.

CONGRATULATIONS:

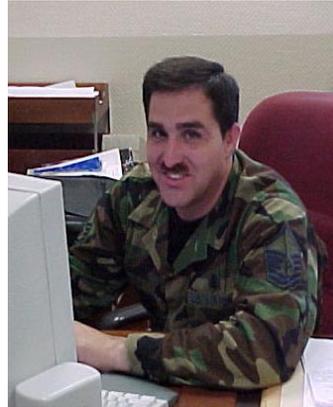
We are proud of our new SSgt selectees. They are:
[SrA Skip Vinson](#), [SrA Kevin Krumm](#),
[SrA Shelley Murray](#), [SrA Apolonio Santos](#), [SrA Jeremy Holder](#), [SrA Christine Khan](#).

HAIL AND FAREWELL:

We had to say goodbye to two of our technicians since the last quarter. SrA Mike Occiano left for sunny Virginia Beach (Langley AFB) and SSgt Steve Elkins left for Keesler AFB in Mississippi. We’ll miss them both.

A warm welcome is extended to our new troops:
SrA Jeremy Holder joins us, all the way from Travis AFB in California. SrA Apolonio Santos arrived from McChord AFB in Washington. Finally SrA Kiesha Gaines joins us from our CONUS ADL at Peterson AFB, Colorado.

New ADL NCOIC



We are pleased to have MSgt Victor W Brady as our new ADL flight NCOIC. Born in Michigan, Master Sergeant Brady was previously assigned as an instructor at the Dental Laboratory Technician School at Sheppard AFB, Texas. His other assignments include McClellan AFB, CA, Wright Patterson AFB, Ohio and Pease AFB, New Hampshire. Please feel free to contact him with any questions or feedback at DSN 496-7547 or e-mail Victor.Brady@sembach.af.mil

SAFETY TIP:

When you are grinding stone, acrylic or metal, always wear an OSHA approved safety mask. Remember, once particles get into your lungs, they can get lodged in your alveoli forever.

GARY A. BRAUN, LtCol, USAF, DC
Area Dental Laboratory Flight Commander

WILLIAM E. DINSE, LtCol, USAF, DC

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Sembach ADL Information Update



Volume 5, Issue 1

Sembach, Germany

15 March 00

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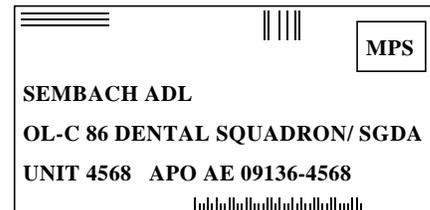
FROM THE TOP OF THE BENCH



Springtime greetings from the men and women of the Sembach ADL.

Come join us at our annual workshop! This is a great opportunity to gain some inexpensive continuing education for the doctor, and hands on experience for the lab technician. Be sure to return your registration form so we may prepare for your visit with us. If you have not received a registration package, please contact us and we will send one to you.

Our workload continues to remain steadily heavy. It has necessitated many of your cases to be transshipped to other laboratories. Unfortunately there are peak seasons for laboratory workload, and we are currently in one of them. Email notices of our workload are sent periodically throughout the month. If you would like to receive a workload report, please send me your email address, and I will include you in our customer updates. Also, let us know if there is any thing else we can provide for you and your patients. Have a great spring.



DSN: 496-6530 / 7733 COMM: 06302-67-6530 / 7733

DSN FAX: 496-6245 COMM FAX: 06302 -67-6245

FIXED ELEMENT

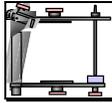
If you are submitting a survey crown, ensure that the preparation is adequately reduced, especially in the areas where a rest is required.

Go-by casts (cast with diagnostic wax ups or stone duplicates of the patient's provisionals) are always welcome, especially for long-span units.

When prescribing a porcelain shade, please give either the Vita classic shade (A2, B1, etc) or the 3D system (2L2.5, 4R, etc). Don't give both, as they don't cross reference well.

GARY A. BRAUN, LtCol, USAF, DC
Area Dental Laboratory Flight Commander

Esther Lewis, TSgt



REMOVABLE ELEMENT

Please send non-distorting bite registrations. Baseplate wax, Aluwax, and copper wax bites all distort in shipping. Instead use a polyvinyl siloxane material such as Regisil PB.

Please give detailed instructions on the DD form 2322. For example, occasionally it is hard to interpret what type of clasp you want based on a hasty drawing on the lab slip. For unusually complicated removable appliances, please add to the instructions wire diameters, or any other details that would be useful to the technician doing your case.

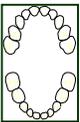
Patrick Coon, TSgt
Chief, Removable Prosthodontic Element



NOTES FROM SHIPPING AND RECEIVING

Don't tape boxes – wrap them in paper. Tape stuck directly to boxes shortens their life span considerably. **Fill in box 2 on the DD form 2322.** We have to have a location to ship to! Always include your Autovon number so we can contact you if we have any questions about your case. Thanks.

Mike Goode, SrA
Shipping & Receiving



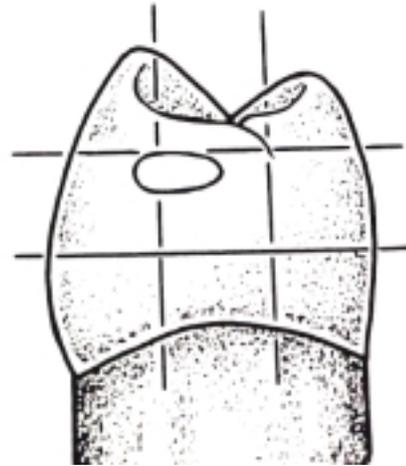
FOR THE TECHNICIANS

CONTACTS:

When technicians wax, cast, apply porcelain, and finish teeth, they tend to reduce the contact area to a point. This is a problem because it can lead to light contacts clinically and problems with food impaction. What follows is a description and some diagrams to illustrate proper contact morphology.

Contact areas are generally **egg-shaped**, with the long axis of the “egg” being oriented

buccolingually. Occlusogingivally, the contact area is located at the junction of the occlusal and middle thirds of a proximal surface.



CONTACT AREA
(PROXIMAL VIEW)

Buccolingually, the contact area can be found at the junction of the buccal and middle thirds of a posterior tooth's proximal surface; except between the maxillary molars, where it is located near the central sulcus area.



MAXILLARY



MANDIBULAR

CONTACT AREAS
(OCCLUSAL VIEW)



FOR THE DOCTORS

NEW PORCELAIN

We have recently added the Vita Omega 900 system to our lab. Now you can use the Vitapan 3-D Master shade guides. We also have the porcelain that corresponds with shades OM1, 2, and 3 for bleached teeth.

LITERATURE ABSTRACT

There are some speakers on the lecture circuit espousing immediate restoration of implants. While this is somewhat controversial, there is some clinical evidence, that in selected cases, immediate loading of implants is a viable option.

Immediate Functional Loading of Brånemark Dental Implants: An 18 Month Clinical Follow-up Study. *Randow et. al.*

A clinical and radiographic study was performed to compare the outcome of oral rehabilitation in the edentulous mandible by fixed suprastructures connected to implants installed according to either a one-stage surgical procedure and immediate loading (experimental group EG), or the original 2-stage concept (reference group RG).

The EG group was comprised of 16 subjects with edentulous mandibles. Beyond the non-smoking criteria, the following specific inclusion criteria were adopted: all patients had to consider themselves to be in good general health; the amount of bone had to enable the installation of 5-6 fixtures, at least 10 mm. long, to be bicortically anchored (Mark II fixtures, Nobel Biocare AB, Gothenburg, Sweden) between the mental foramen; the patients had to be available for the follow-up and maintenance program.

A total of 88 implants were placed in the EG (16 patients) compared to 30 in the RG (11 patients). The EG fixed appliances were connected to the implants within 20 days following implant installation; while the fixed appliances in the RG were connected about four months following fixture installation.

At the time of delivery of the suprastructures, all 27 patients were radiographically examined; an

examination that was repeated at the 18 month follow-up. The analysis of the radiographs from the EG disclosed that, during the 18 month observation period, the mean loss of bone support amounted to 0.4 mm.; the corresponding value observed in the RG was 0.8 mm. During the 18 month observation period, no fixture was lost in either of the two groups examined. The implants under study, as well as those in the referenced material, were found to be clinically stable at all observation intervals.

The present clinical study demonstrated that it is possible, at least based on an 18 month observation period, to successfully load dental implants immediately following installation via a permanent fixed bridge and cross arch suprastructure. **However, such a treatment approach has so far been strictly limited to the intra foramen area of the edentulous mandible.**

Clin Oral Impl Res 1999;10:8-15

AKERLY TACS

Depending on the type of practice you have, you will occasionally have the opportunity to make a set of complete dentures. Arguably, two of the most challenging parts of the procedure are obtaining a good mandibular impression and an accurate centric jaw relation record. What follows is a description of a technique that I like to use that allows for immediate verification of the patient's centric relation. It is called the Akerly Tac Technique.

1. Before your CJR appointment, take three small tacks – available at your local hardware store and use a heatless wheel to modify the point to form a pyramid.



Tack – ½ inch in length

2. Establish your vertical dimension of occlusion, mark the midline, high smile line, and corners of the mouth for cuspid placement (I set the anterior 6 teeth if I have time).

3. Now remove about 2 mm of wax from the occlusal surface of the lower baseplate.
4. Lute the tacks into the lower baseplate – one on each posterior quadrant and one in the anterior section. Hold the tacks with a cotton forceps, heat them a bit, and embed them into the baseplate to form a tripod. Take a black indelible marker and mark 2 mm of the bevel of the anterior, middle tack. This will serve as a reference mark.



5. Replace the baseplates in the mouth and guide the patient into CR. I will frequently have the patient place their tongue back as far as possible while closing. The closing action will cause the tacs to make three marks on the maxillary occlusion rim. Take the round end of a #7 wax spatula (not heated) and enlarge the marks by twirling it in the center of the marks. Add some hard inlay wax to the dimples you have created with the wax spatula.



6. Place the lower baseplate in your patient's mouth, heat the three inlay wax areas on the upper baseplate, insert the baseplate, and guide your patient into CR. Have your patient close until you can't see the black

mark on the anterior, middle tack. Have them open. Check your marks. Have them close. If your patient consistently returns to the same marks you can be confident that you have verified CR. The beauty of this technique is that you verify centric relation in three dimensions.



7. At this point while the patient is closed in CR, I heat three paper clip "staples" and carefully lute the upper and lower baseplates together. Carefully remove the baseplates from the patient's mouth and mount the mandibular master cast on an articulator.

Try this technique. It will save you time chairside when you deliver the denture.

CONGRATULATIONS:

SrA Shelly Murray was selected as the 86th Dental Squadron Amn of the Year and the Amn of the Year for the 86th Medical Group as well!

SrA Kevin Krum and SrA Skip Vinson were promoted to SSgt in March.

ADL Lab tech of the Month:

Jan : SSgt Kevin Krumm

Feb: SSgt Violet Olivo

March: SrA Kate Gsell

HAIL AND FAREWELL:

We had to say goodbye to two outstanding technicians since the last quarter. TSgt Celestine Christodoss PCS'd to Tinker AFB in Oklahoma City, OK. SrA Shelly Murray left for Hanscom AFB in Massachusetts. We will miss these fine troops. Welcome TSgt Borgeson from Sheppard AFB Texas. SSgt William Devine joins us from Tyndall AFB Florida.

SAFETY TIP:

Occupational illnesses and injuries among health care employees are on the increase, contributing to 200,000 injuries annually. Lost workdays have nearly doubled over the last decade. In fact, studies show that health care workers in general suffer more illnesses and injuries than employees in all types of private industry.

To prevent these injuries and illnesses, employees need to know:

- ❑ The hazards associated with their job
- ❑ Proper lifting techniques
- ❑ Safety guidelines
- ❑ Protective measures set by OSHA, the CDC, and your employer

Source: Safety Jan 00

GARY A. BRAUN, LtCol, USAF, DC
Area Dental Laboratory Flight Commander

WILLIAM E. DINSE, LtCol, USAF, DC
Assistant Flight Chief

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Sembach ADL Information Update



Volume 5, Issue 2

Sembach, Germany

15 July 00

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FROM THE TOP OF THE BENCH

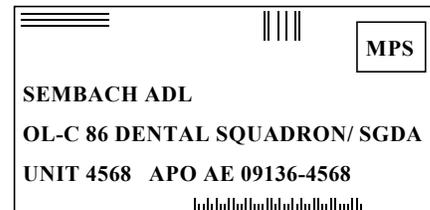
Summer greetings from the men and women of the Sembach Area Dental Laboratory. If you are a recent arrival to Germany, WELCOME! If you are leaving this summer, we wish you the very best on your future assignment or endeavors. For me, I will be leaving this summer to begin a new assignment at Scott AFB in Illinois. I am thankful for the opportunity to have served in USAFE. We will miss the many friends we have made while here in Germany.

It has truly been an honor and my sincere privilege to serve with the men and women of the Sembach ADL. Certainly, these are the most dedicated and talented technicians I have ever had the pleasure with whom to work. I am sure they will continue to produce the high quality products you seek for your patients. I leave you in the best of hands as Lt Col Randy Duncan assumes the command of the ADL. He has been teaching at Lackland AFB in the prosthodontic training program. He also brings a wealth of experience from working at the Kadena ADL before going to Lackland. Thanks for all of your terrific support. I wish you the very best in the future. Auf Wiedersehen.

GARY A. BRAUN, Col, USAF, DC
Area Dental Laboratory Flight Commander

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- Patrick.Coon@sembach.af.mil Chief Rem. Element



DSN: 496-6530 / 7733 COMM: 06302-67-6530 / 7733
DSN FAX: 496-6245 COMM FAX: 06302 -67-6245

ADL Workshop Was a Success:

The 4th annual tri-service workshop provided an excellent opportunity for information exchange. Thanks again to all the lecturers, hands on course presenters, and companies for making it a big success. Next year's workshop will be held in September 2001.

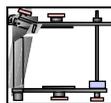
FIXED ELEMENT

Just a few tips to help you receive the highest quality prostheses possible. First, always send the final impression with the case. It serves us in many ways. We use a solid cast to verify proximal and tissue contacts on every case. Also, if a bridge needs to be cut and soldered, a solid cast ensures the accuracy of the soldered units. Lastly, accidents

happen from time to time and a model may get broken. Without an impression to repour, the case would have to be put on hold while you ship a new cast to us.

The other area I'd like to address is information given to us on the DD Form 2322's. Too often, we get almost no instruction in block 26 "Clinician's Remarks". It is very important to us that we give you exactly what you want. Simply coloring in the teeth in block 15 "Prosthesis Design" isn't enough. Please write specifically what you want concerning areas like margin choice and cutback design. A hand drawn picture is always best to clarify cutback design and mixed shades. With your help in these areas, quality can remain at the forefront. Thank you for all the support you give to us, we truly are "here for you."

SSgt Timothy J. Reim
Fixed Prosthodontic Element Chief



REMOVABLE ELEMENT

Occasionally we receive cases in the Acrylic section which cause a little bit of confusion for us. Usually this is the result of unclear instructions on the DD Form 2322. When submitting a case, please be sure that any information in the "Clinician's Remarks/Instructions" block of the form matches up with the design drawn on the casts or in the "Prosthesis Design" section of the DD Form 2322. If these do not match up, it may delay the fabrication of the appliance as we attempt to contact you for clarification. Also, please be aware that if we receive a case with a design drawn, but no instructions written on the DD form 2322, we will fabricate the appliance exactly as drawn. For example, if a design for a Hawley retainer is drawn without clasps, we will fabricate a retainer with no clasps, even though our standard design would normally include them.

Whenever we fabricate an appliance in the Acrylic section, we always include patient identification in the form of typed information on shrinkable plastic that is embedded into the acrylic. We prefer to include the patient's complete last name, first initial and entire social security number, but as a minimum we need to have at least the initial of the last name and the last four digits of the social security number. Sometimes it is difficult for us to even type the latter, however, because we cannot read the information on the DD form 2322! We prefer that all DD form 2322s submitted to us be typed, but

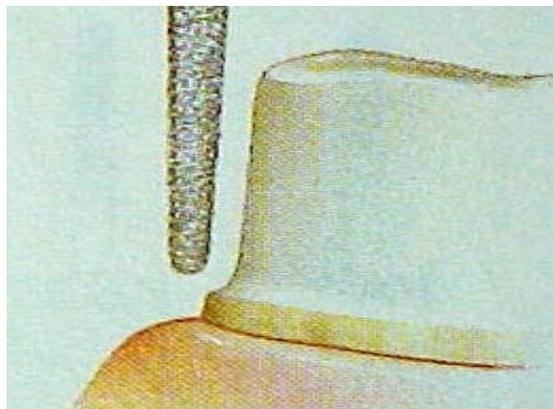
if they must be handwritten, please print legibly to avoid any confusion.

SSgt Justin Stolte
Removable Prosthodontic Element

FINISH LINE CONFIGURATIONS

There are several types of finish line configurations (margins) described in the dental literature. I will describe the four main types that we see at the Area Dental Lab and provide some brief comments about each type.

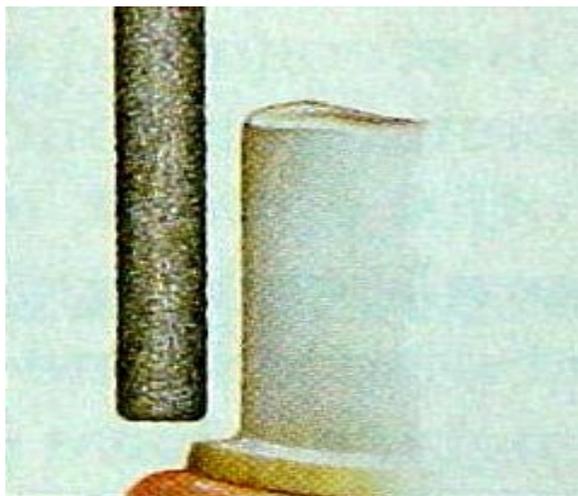
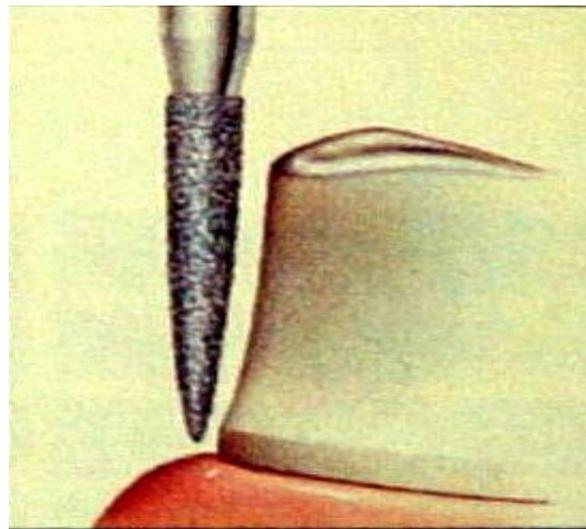
The **chamfer finish line** is probably the most common margin design we see here. Many dentists prefer this finish line possibly because it is quick and relatively easy to place. Many dental schools teach this as their default finish line. It is used mainly for full and partial veneer gold crowns, porcelain laminate veneers, and lingual margins of porcelain fused to metal crowns. Farah and Craig have shown experimentally that the chamfer finish line exhibits the least stress, so theoretically the underlying cement will have less likelihood of failure.



There are some downsides to this margin design. Because of the conical shape of the diamond, it is difficult to place an adequate chamfer interproximally without over tapering the preparation or damaging the adjacent tooth. If in the fabrication process the margin ends up short, the margin will be open clinically. Sometimes the dentist prepares deeper than one half the width of the diamond and a "lip" of unsupported enamel can result. This can lead to future margin breakdown. In addition the "stone

lip” on the cast is easily fractured during the fabrication of the crown.

The **shoulder** is the default margin for crowns requiring shoulder porcelain. A full circumferential shoulder is required for all ceramic crowns using the IPS Empress, the In-Ceram, and the Procera systems. Your goal for the shoulder is to achieve a uniform 1-2mm axial reduction with a glassy smooth cavosurface area. One technique I use to finish my preparations is to run a course diamond on slow speed to smooth up not only the shoulder but all the surfaces of the preparation. Another trick is to take a sharp Wiedelstadt chisel or a hoe to smooth the shoulder. I also use this hand instrument to gauge the amount of axial reduction.



Ceramacists love well designed shoulders because it is easier for them to manipulate the porcelain. There is one final tip regarding the shoulder margin. Visualize clinically where you want your shoulder porcelain to end. We see many cases that can result in unesthetic metal show because the shoulder preparation was not taken far enough interproximally.

The **knife-edge finish line** has limited applications. A thin margin is more subject to abuse during the fabrication process. In addition, according to Shillingburg, hydraulic pressure may open the margin during seating. He also concludes that the margin may distort when subjected to occlusal forces. Another drawback is that the crown may be overcontoured because the technician adds additional wax to the outside axial surface to prevent distortion.

In spite of these limitations there are some uses for the knife-edge finish line. It can be used on teeth with very convex axial surfaces as well as the surface toward which a tooth may have tilted. The knife edge’s main application, in my opinion, is to place a margin on the surfaces of teeth that have been root amputated or hemisected. Because teeth have a natural convex emergence profile in these areas, the margin actually has substantial bulk to prevent distortion.

Probably my default margin for fixed prosthodontics is the **shoulder bevel**. If I am not placing a shoulder for a porcelain margin, I use the shoulder bevel most of the time. I will digress a little regarding margin placement for porcelain fused to metal crowns. I realize that patients are more conscious of esthetics, however I fail to see the advantage of placing a shoulder margin on mandibular posterior teeth or maxillary second molars. Unless the patient has unusual tooth position, the shoulder bevel with a small metal collar is a better clinical margin for esthetically non-critical areas of the mouth. Bear in mind that the shoulder requires more laboratory expense.

The shoulder bevel takes a little practice to master, however it is well worth the effort. I place my bevels with a thick flame diamond (Brassler 862 Flame 016 fine). Dr. Kois recommends a diamond with a 45° bevel such as a Brassler 885 beveled cylinder 014 fine. This margin design allows the laboratory technician to give you a closed margin even if the margin is slightly short. These margins feel good with an explorer and look great on radiographs.

In my opinion, doing fixed prosthodontics well is very demanding. Remember to slow down a little and think before you pick up the handpiece.

Treat your patients the way you would treat a loved one. Not all patients are suited for fixed prosthodontics, the best margin in the world will fail in the face of substandard oral hygiene.

William E. Dinse, DMD,MS

CONGRATULATIONS:

Dr Gary Braun pinned on Colonel on 24 March 2000

TSgt Select's Darren Low and Robert Henson

ADL Lab tech of the Month

April: TSgt(s) Low

May: SSgt Vinson

June: SrA Goode

HAIL AND FAREWELL:

Hails,

-SSgt William Devine, McDill AFB FL.

-SSgt Brett Bragdon, Hurlbert Field FL.

-SrA Thomas Hall, Kadena AFB Japan

-SrA Kevin Keene, Peterson AFB CO.

-SrA Renee Warren, Lackland AFB TX

-Mr. Terell Paulli, Peterson AFB CO.

Fairwells,

-TSgt Esther Lewis, Hill AFB UT.

-SSgt Ronald Drake, Scott AFB IL.

-SSgt Paul Gsell, Separated

-SrA Catherine Gsell, Wright Patterson AFB OH.

SAFETY TIP:

Cumulative trauma disorders (CTDs) is one of the latest buzzwords in the field of ergonomics. There are several factors that place you at risk for CTDs. Repetitive motion—doing a job that requires performing the same movement continually. Excessive force—doing a task that places extra pressure and strain on a particular part of the body. Awkward Posture—performing a function that places your body in an unnatural position. Other risk includes working with vibrating tools, working in a cold environment, being in poor physical condition.

Preventing CTDs is possible by following three easy steps. The key words to remember are: analyze, minimize and neutralize. First analyze the risks you may be exposed to on a particular job. Second minimize those risks by finding ways to

reduce repetitive motion and excessive force. Third, neutralize awkward postures that may cause strain and tension by placing your body in a natural, relaxed position. In a neutral position your shoulders and back are relaxed, your neck is straight and your arms and elbows are close to your body.

Source: Coastal Safety Environmental, Cat No ERG00H

GARY A. BRAUN, Col, USAF, DC
Area Dental Laboratory Flight Commander

WILLIAM E. DINSE, LtCol, USAF, DC
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USAFE Sembach Area Dental Laboratory

Information Letter

Volume 5, Issue 3

Sembach AB, Germany

22 Nov 2000

Many changes have been implemented at the Sembach ADL in an attempt to provide our customers with the highest quality products within a reasonable time frame. One of our largest obstacles to providing you with the best service is your ability to submit your cases in compliance with our submission standards. Currently, only 8% of the cases we receive meet these submission standards, which result in significant delays in processing your prescriptions.

All Air Force ADLs have published submission standards that establish guidelines on how to submit cases. First, it identifies all necessary items to send to the ADL to enable us to carry it through to completion. This includes master casts, opposing casts, diagnostic/go-by casts, solid casts, occlusal registrations, impressions, tooth shades, RAPs, tube-teeth, precision attachments, and of course specific instructions on pontic designs, removable partial denture designs, and fixed framework cutback designs. Second, it states the condition which items must be submitted so that the case is directly placed into production at the ADL. If your case requires further work before it can be fabricated (i.e. pouring impressions, trimming casts, pinning dies, designing partial dentures, etc.), it creates a significant delay in the production process. As an ADL, we do not have the personnel or equipment to perform the basic laboratory procedures that are expected to be performed at the BDL. A properly submitted case will insure that it goes directly into production when it arrives, and will ultimately result in a shorter turn-around time.

The ADL management team determined that the submission standards document in use was too long, and confusing to many of our customers. To that end, we have redesigned our submission standards into a single page document, the "Ruck Zuck" (quick look), which is attached to this information letter. Hopefully, this will make it easier for you to meet the submission guidelines so we can best serve you and your patients. Also attached, are our default standards of fabrication for the various departments. Often information is missing or vague on a DD Form 2322, and contact with the doctor is not possible due to leave, TDY/TAD, or other

reasons. The guidelines or "defaults" are intended to aid our technicians in making decisions to fabricate a quality prosthesis for your patients in the absence of explicit instructions. A fixed prosthodontic "PFM Design Options" form is enclosed for your use as well. This form, designed by Mr. Meaney at the Peterson ADL, can be submitted with your fixed cases to more accurately communicate your design requests to us.

Please visit our web site for the most current turn-around times published. This site is updated weekly to assist you with patient scheduling. The current status of your cases is also posted there for your convenience. If you have any other needs or requests, please do not hesitate to call or e-mail us.

RANDALL C. DUNCAN, Lt Col USAF, DC
Area Dental Laboratory Flight Commander

CURRENT CASE TURN-AROUND TIMES:

FIXED DEPARTMENT:	35 days
FRAMES DEPARTMENT:	31 days
ACRYLIC DEPARTMENT:	11 days

Note: The most current turn-around times are published and updated weekly on our website. Click on the metrics button.

Rush Cases!!!

Due to the high workload and the present manning levels at the Sembach ADL, we can no longer expedite cases for you. The only exception for this policy is for deploying personnel; if one of your patients is deploying, we will make every effort to complete your laboratory request. Please contact LTC Duncan or LTC Dinse for deployment rush cases.

WE ARE BACK ONLINE!

Thanks to the hard work of Lt Col Duncan and TSgt Coon, we have our website up and running again. Check out the new format at:

<https://wwwmil.usafe.af.mil/ramstein/86ds/adl>

You will find newsletters, submission standards, case status information, current turn-around times, ADL metrics, ADL forms, and a vast list of links to other pertinent websites.

QUALITY CONTROL FORMS – HELP US HELP YOU

Please return your QC forms (ADL Form 48B). To keep accurate metrics and help us do a better job for you, simply fill out the form and place them in the shipping box with your next case submission. Currently, only 33% of these forms are being returned to us, which makes it difficult to establish credible data.

Notice - We are putting together an e-mail database of our customers. Please add your e-mail address to the DD Form 2322 or send it to us at one of the above addresses. This helps us correspond quickly with our customers and helps turn your cases around quicker.

FIXED ELEMENT

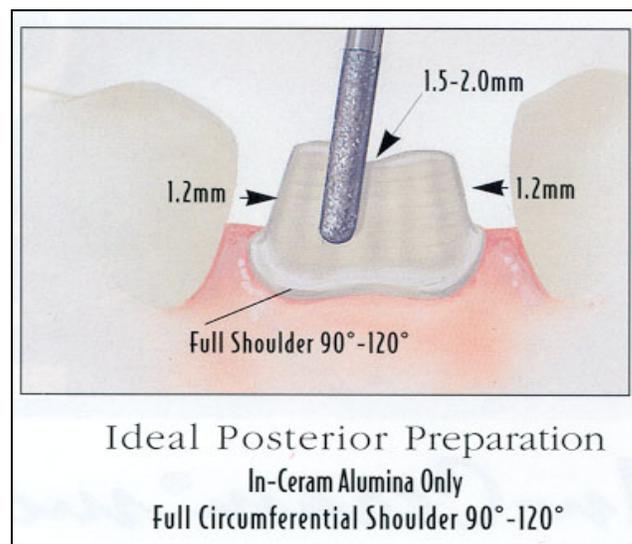
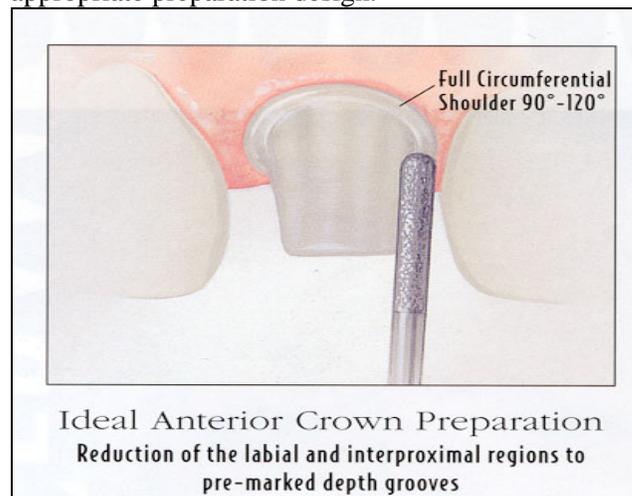
ALL CERAMIC ESTHETICS WITH IN-CERAM CROWNS

We have been making In-Ceram crowns here for over 3 years. For our new customers, here are some tips on using this all ceramic restoration:

We fabricate single anterior or posterior crowns, and three unit anterior bridges. We also fabricate single tooth implants for the CeraOne abutment system.

CLINICAL REQUIREMENTS: Preparation design is similar to porcelain jacket or Empress crowns. Margins must be a 90 -120 degree chamfer, 360 degrees around the preparation. Axial reduction should be 1.2 mm to 1.5mm (including facial two-plane reduction). Occlusal reduction should be 1.5 to 1.7mm. Remember, these restorations require bulk

for strength. This is most critical on the palatal surface of maxillary anterior teeth. One millimeter of palatal surface reduction is essential. Prepared surfaces must be smooth and slightly rounded, with no sharp edges, angles, or undercuts. These preparations require more refinement than PFM or gold restorations. Sharp corners or rough margins that may slightly compromise a metal restoration may make an all-ceramic restoration unmanageable. Below are the manufacturer's recommendations for appropriate preparation design.



LABORATORY SUBMISSION REQUIREMENTS: Polyvinyl siloxane impression materials work best with In-Ceram units because of their accuracy and multiple pour capabilities. As with all cases submitted to the ADL, we request that you send the impression as well as the casts.

Single units require traditional methods for preparation of the casts and dies. **Please do not block out undercuts, or place die spacer or hardener on the dies.** (The In-Ceram system uses a

special die spacer, applied at the ADL, to ensure accurate fit.)

Fixed partial dentures require two master casts. The first cast should have removable dies trimmed to expose all margins while retaining as much of the pontic land areas as possible. The second cast should be a solid cast, to verify fit, and serve as a backup. Again, do not block out the undercuts or apply die spacer or hardener to the dies.

Implant cases will require an impression be made from the fixture level. The cast that is sent must include the metal abutment attached to the fixture. For example, we cannot construct an In-Ceram crown on the CeraOne plastic analog.

Shade selection is best accomplished using a Vita shade guide. In-Ceram units can be adjusted and characterized similarly to other porcelain restorations. Microabrade the internal surface Prior to cementation, then cement the units using Panavia 21 or a glass ionomer cement. In-Ceram cores cannot be etched using conventional techniques.

DIE STONES IN THE LAB

In today's dental laboratory, there are many different gypsum products on the market; and in every laboratory, there are several different artificial stones being used. One important decision to make is which stone to use for the initial pour of a fixed restoration. The decision you make can affect the accuracy and fit of your restorations.

A quality die stone should be used for the initial pour. During the process of fabrication, a die must withstand the rigors of crown fabrication. This includes waxing, seating, and finishing. The market is full of die stones to choose from. There are several factors you should consider when making your decision. These factors take into consideration the physical properties such as compressive strength (hardness), and expansion.

Some of the more familiar stones being used in dental labs are: Modern Materials Die-Keen, Die-Stone, and Mile Stone, Whip Mix Prima-Rock, and Silky-Rock, Resinrock, and Super Die. Of these choices, there are advantages and disadvantages to each stone. Some stones have rather high expansion rates in comparison to other stones. This could affect the fit of the restoration in the oral cavity. High expansion stones can provide an acceptable fit on restorations involving single units. On the other hand, the expansion of these stones could cause problems with long span restorations.

Some stones have a higher compressive strength than others do. This means that some dies will be able to withstand more of the rigors from the manufacturing process. If you decide to use a softer stone, the use of a die hardener should definitely be considered, although, we recommend die hardener on all dies regardless of the stone hardness.

Another point to consider is how the restoration is fabricated. If you do not want the restoration to be finished/polished on the master die, then you should enclose a prepared "working die" when you submit the case to the lab. Any die used during the metal finishing process will be damaged at the marginal areas. The utilization of a separate working die allows us to carefully evaluate the fit of the restoration on the undamaged master die. Also, in the event that the restoration needs to be remade, the fabrication process simply starts again with the master die rather than having to pour/pin a new die. Although it takes more time initially to prepare two sets of dies, the process ultimately results in a higher quality restoration and a shorter adjustment time clinically.

The following is a list of the physical properties to aid in the decision of which stone you might consider using.

<i>Modern Materials Stones</i>	Compressive St Psi.	Expansion %
Die Keen	18,000	.18 to .20
Mile Stone	18,000	.08
Die-Stone	15,000	.07
Tru-Stone	15,000	.09
<i>Whip Mix Stones</i>		
Prima-Rock	17,000	.13
Silky-Rock	13,000	.09
Super Die	12,000	.08
Resinrock	11,000	.08

SOLID CASTS SAVE YOU TIME

There are three areas of adjustment for fixed prosthodontic restorations/prostheses that often frustrates the clinician. These are seating discrepancies between the cast and the mouth, inaccurate interproximal contacts, and inaccurate occlusion. Problems in these three areas can be due to clinical and/or laboratory errors and it is often very difficult to discern between the two. Problems with occlusion can be due to inaccurate casts, poorly made or lost provisional restorations, or wear of provisional restorations for long periods of time. Most occlusal problems we see here are clinical in nature and can

be simply avoided by verifying the occlusal relationship of the casts with that of the teeth.

Seating discrepancies and the adjustment of interproximal contacts are difficult to identify and adjust on a pinned master cast. The use of a solid cast has several advantages:

1. A solid cast gives much more reliable information about the interproximal contacts than a pinned cast.
2. A solid cast is used to verify the relationship of abutments in FPD cases.
3. An untrimmed solid cast gives the technician information about the tissue. Occasionally we will change emergence profiles based on what we see on the solid cast. If you are concerned about our ability to correctly trim to the margins on a solid cast, you may do the trimming. Keep in mind that we do not normally alter the prosthesis's margins based on what we see on the solid cast.
4. Occasionally, master dies, as we receive them, are not an accurate reproduction of the impression. There are several reasons for this, including chalky areas, sharp areas not reproduced well, and rough handling. The use of a solid cast acts as a separate fitting die, and allows us to correct many of these errors.

In the absence of seating dies, we will use the solid cast as a duplicate seating die. In this case we are trying to assure the technician will not inadvertently alter the master die during seating procedures. We may also use a solid to correct porcelain margins if the master die appears unreliable. Correct use of a solid cast will decrease the interproximal contact adjustment time on most of your cases, otherwise, plan on more time to properly seat your restorations.

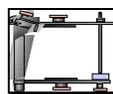
Therefore, we request that you send solid casts for all of your fixed prosthodontic cases. Simply pour a low expansion improved stone into the final impression and ship the final impression with the solid cast to the ADL. Polyvinyl siloxane impression materials work best for multiple pours.

TRIPLE-TRAY TIPS

Triple-Tray impressions are useful clinically when used properly, however, it is very technique sensitive procedure and we have seen some problems over the years. The occlusal registration is a critical part of the procedure. Make certain the patient is biting in maximum intercuspation when the impression is made. Many patients try to "help" by moving into a protrusive or lateral position when biting together with the Triple-Tray in place. The

dentist then can watch the anterior tooth position before the patient actually bites into the Triple-Tray impression. Then while making the impression, the dentist can be sure the anterior teeth are in the same position during the actual impression. Do not leave the patient unattended during the impression making procedure: many times the patient will open their mouths or move their jaw, not realizing that it will distort the impression.

The occlusal relationship of Triple-Tray mounted casts cannot be evaluated or corrected in the laboratory, therefore, what you give us is what you receive. The specially designed Triple-Tray articulators will only reproduce maximum intercuspation. disclusive contacts cannot be reproduced. Therefore, the use of the Triple-Tray for fixed partial dentures is not recommended.



REMOVABLE ELEMENT

The Acrylic Department has recently converted all artificial teeth to Trubyte Portrait IPN teeth and no longer stock Trublend SLM teeth for your denture and RPD cases. This will simplify shade selection since Trubyte Portrait IPN teeth are keyed to the Vita shade guide, therefore, you may use the Vita or Portrait shade guides when selecting a shade. Also, we no longer carry 20-degree teeth, as they were no longer being utilized. As always, we aim to provide our customers with top quality service and prostheses so please keep us informed as to your satisfaction with Portrait teeth.

ADL WORKSHOP - September 2001

Mark your calendar for our next workshop – September 2001. We chose this date because of the heavy schedule of local CE Events next Spring. If anyone is interested in challenging the CDT, contact us. If we get enough interest, we will set up the exam at next year's workshop. We will post information about the workshop on the web site as it is made available.

A WAY TO IMPROVE YOUR FIXED DESIGNS

Download from our website or copy the enclosed attachment "USAF ADL Fixed PFM Design Options". This is a great idea that was developed by

the Peterson ADL that easily communicates your request to us. You can use this form to prescribe the metal cut back design and the pontic form for crowns/retainers and fixed partial dentures.

NEW BOXES – GET IT THERE IN ONE PIECE

Many of our customers are asking for a source for shipping boxes. In addition to the standard container, Peterson ADL recommends these new four-slot boxes, which hold up to four casts in one container. We have recently ordered these and will be using them in the near future. These larger boxes were purchased in response to your constructive feedback saying that the old two-slot boxes were too small and often over packed, resulting in returned items sometimes being damaged. Because most cases are submitted with a master cast, opposing cast, impression and solid cast, a four-slot box will work well for the average case.

The four-slot box, lid, and foam inserts are sold as a complete set for \$2.75 each. If you damage or contaminate the four-slot foam inserts, two foam inserts from the old two-slot boxes placed side-by-side will work as well. Please remember to place disinfected casts, impressions, etc. into a plastic bag before placing them into the box – infection control guidelines require us to discard the foam inserts on every container that arrives at the ADL without a plastic bag!

Four-slot shipping boxes can be purchased from:

Tharco
13400 East 39th Ave
P.O. Box 39103
Denver, CO 80239-0103
1-800-525-1831

Part #Z68591 A B C
(A = Lid; B = Box; C = Foam)



CONGRATULATIONS:

NEW SSgt Selects

SrA's Gaines, Warren, Crowell, Murray and Hall

NCO of the Quarter for the 86th DS

TSgt (S) Low

AMN of the Quarter for the 86th MDG

Sgt (S) Crowell

HAIL:

LTC Duncan (Lackland AFB, TX)
TSgt (sel) Henson (Sheppard AFB, TX)
SSgt Fowler (Peterson AFB, CO)
SSgt (sel) Murray (Eglin AFB, FL)
Mr. Hill (Peterson AFB, CO)

FAIRWELL:

SSgt Stolte (separated)
Mr. Honey (retired)
SrA Goode (separated)

WE MAY BE CONTACTED BY:

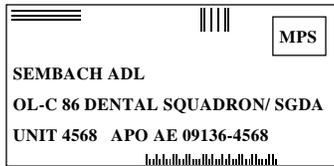
Sembach.ADL@sembach.af.mil Shipping/Receiving

Randall.Duncan@sembach.af.mil Flight Commander

William.Dinse@sembach.af.mil Asst. Flight Commander

Victor.Brady@sembach.af.mil Flight NCOIC

Robert.Henson@sembach.af.mil Chief Fixed Element



DSN: 496-6530 / 7733 COMM: 06302-67-6530 / 7733

DSN FAX: 496-6245 COMM FAX:06302 -67-6245

WILLIAM E. DINSE, Lt Col, USAF, DC
Assistant Flight Commander

Distribution:

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ADL Peterson AFB, CO

Attachments:

- 1) ADL Default Standards
- 2) Ruck Zuck Submission Standards
- 3) USAF ADL Fixed PFM Design Options

SEMBACH ADL DEFAULT STANDARDS

Acrylic Department

1. Complete Dentures

- 1.1. Will be set using lingualized occlusal scheme with 33° maxillary posteriors opposing 10° mandibular posteriors.
- 1.2. Denture bases will be festooned according to the patient's age.
- 1.3. Dentures bases will be positively stippled to the distal of the 1st bicuspid.
- 1.4. Anatomical palates will be used, unless otherwise requested.
- 1.5. Ivocap acrylic shade US-L will be used.
- 1.6. Peripheral flanges will be finished to a uniform thickness of 2 mm on complete dentures. Flanges will not be reduced on overdentures or immediate dentures; the submitting dentist will adjust these.

2. RPDs

- 2.1. Acrylic resin contours will be festooned to match remaining teeth.
- 2.2. Ivocap acrylic shade US-L will be used.
- 2.3. Single tooth replacements with minimum space, will be sprinkled with cold-cured tooth shade acrylic.

3. Interim Removable Partial Dentures

- 3.1. Circumferential clasps are made with .032" stainless steel wire.
- 3.2. Prostheses with one to three teeth are made using autopolymerizing acrylic resin material for flanges and orthodontic pink acrylic resin in palatal and lingual surfaces.
- 3.3. Prostheses with four or more teeth are made using heat/pressure cured material (Ivocap acrylic shade US-L).

4. Orthodontic Appliances

- 4.1. Retainers are fabricated with pink acrylic resin unless otherwise requested. Other colors available are:

Blue, Red, Green
Violet, Black, Yellow
Glow-in the dark, Neon orange
Neon green, Neon yellow
Glitter is available in all

- 4.2. Maxillary retainers are made with 0.032" labial bow with 0.032" C-clasps around the most posterior tooth.

- 4.3. Mandibular retainers are made with 0.032" labial bow and two finger-rests on the occlusal surface of the first molars.
- 4.4. Finger springs are made with 0.020" wire without helical loops.
- 4.5. Mandibular lingual arch appliances will be made with 0.036" wire and omega loops.
- 4.6. Space maintainers will be made with 0.036" wire and are cantilevered straight across (not bent to follow the contour of the ridge).
- 4.7. Blue-grass appliances use 0.036" wire with the acrylic roller placed between the cuspids.
- 4.8. Rapid Palatal Expanders are placed as deep in the palate as possible.

5. Miscellaneous

- 5.1. Mouthguards are made with clear material extending 3-5 mm past the gingival line on the buccal, 10 mm on the lingual, and opened slightly in the frenum areas.
- 5.2. Occlusal Devices (Nightguards, TMJ Splints, orthoses, etc.) will be made with Great Lakes auto-polymerizing clear acrylic resin, using the pour-flask technique. If no occlusal registrations are submitted, the casts will be mounted in an articulator at maximum intercuspation. The articulator is opened to allow a flat posterior plane, and an anterior ramp will be used to disclude the posterior teeth in excursive movements at average articulator settings (Bennett angle = 15°, condylar inclination = 30°).

Fixed Department

1. General Guidelines: All attempts will be made to completely evaluate the occlusal relation of the arches before fabrication of a prosthesis. A complete wax up of the case with contacts noted will be done before a cutback is designed. The cutback design will be made with considerations for the thickness of any restorative material, the patients' disclusion, and the esthetic demands of the case.

- 1.1. For all cases mounted (if restoration will be in occlusion) the casts will be mounted in maximum intercuspation and equilibrated to achieve maximum contact if no other guidance is given.
- 1.2. Existing wear facets will be used to determine the condylar settings when no occlusal registrations are available.
- 1.3. When possible, restorations will be fabricated to a mutually protected occlusion.
- 1.4. When possible, restorations will be fabricated with A, B, and C occlusal contacts. Minimum fabrication standards will be at least AB or BC combinations.
- 1.5. Cases with group function, with minimal vertical overlap, or edge to edge anterior occlusion will have posterior crowns made with metal occlusal contacts to minimize wear.
- 1.6. All dies will have surface hardener applied. Die spacer will be applied to unspaced dies unless otherwise instructed.
- 1.7. Porcelain crown cases with inadequate occlusal reduction (1 mm or less), will be made with metal occlusal contacts.
- 1.8. If anterior esthetic cases are submitted with no guidance, case will be waxed to diagnostic stage and returned to the provider for evaluation.
- 1.9. Proximal contacts are adjusted with 2 pieces of 8 micron shimstock.
- 1.10. If no solid cast is available, proximal contacts will not be adjusted.

1.11. Occlusal contacts will be adjusted using shimstock (slight drag on prosthesis).

2. Pontic Guidelines

2.1. Maxillary pontics will be fabricated as modified ridge lap design. They will contact just facial to the crest of the ridge near the apex of the pontic.

2.2. Mandibular pontics will be fabricated as modified ridge lap if in porcelain. Hygienic, or Perel pontics will be used on posterior mandibular fixed partial dentures made of all metal. However, these require a 6 mm height from occlusal table to gingival tissue measured at the center of pontic. If there is insufficient occluso-gingival space for a hygienic pontic, attempts will be made to fabricate a modified ridge lap pontic design. If the ridge is very flat, and space is insufficient for a hygienic pontic, a bullet pontic will be attempted.

2.3. Exceptionally large all metal pontics in the molar region may be hollowed from the facial or lingual and filled with acrylic, like *Visiogem*® to aid in reducing casting porosity. Attempts will be made to coordinate this with the submitting dentist to determine whether gold will show, or which shade can be selected for the acrylic.

2.4. All porcelain fused to metal pontics will have a ridge contact only in porcelain.

2.5. Ridge areas will not be relieved to create closer contact unless specifically directed.

3. Cutback Designs

3.1. Maxillary posterior teeth will be fabricated with all occlusal contacts in metal. Proximal contacts will be in porcelain where possible.

3.2. Maxillary incisors will be fabricated with centric contacts in metal when possible. If centric occurs within 2 mm of the incisal edge, the contact will be in porcelain.

3.3. Maxillary cuspids opposing natural teeth will have centric metal contact and excursions will be in metal up to 1mm from the incisal edge.

3.4. Mandibular molars will have facial cusps in metal if stamp or supporting cusps contact opposing teeth. The cutback for porcelain facial veneer will have metal 1 mm from cusp tips to porcelain window on facial. Interproximal contacts will be in porcelain.

3.5. Porcelain margins will be fabricated on shoulder preparations. Metal margins will be made on beveled margins or chamfer margins.

4. Cutback Designs for Fixed Partial Dentures (FPDs)

4.1. FPDs will be fabricated with occlusal in metal where possible. Strength will be maximized through proper cutback design. A minimum of 3mm height for the pontic connections will be attempted. (2 mm in anterior, 3 mm in posterior)

4.2. To maximize strength in the anterior areas, a lingual metal scalloped cutback design will be used if occlusion permits.

4.3. Anterior pontics will be fabricated with normal cingulum contours. Lingual anatomy will be placed to aid in the strength of the restoration and to help reduce wear

RPD Framework Department

1. When designs are given by the submitting dental officer and there is a discrepancy between directions on the DD Form 2322 and the design cast:

- 1.1. The design on a surveyed design cast will be used when fabricating the RPD
 - 1.2. Written directions in block 15 of the DD Form 2322 may supplement the prescription that is drawn on the cast.
 - 1.3. When a designed surveyed cast is not submitted, the master cast will be duplicated. The duplicate master cast will then be surveyed and designed by one of the ADL officers as time permits. When the design is completed, it will then be entered into the fabrication process.
 - 1.4. Any case submitted without a surveyed designed cast may be returned to the submitting dental officer for design.
 - 1.5. The metal to be used will be determined by the ADL officer, unless otherwise requested by the submitting dentist.
2. Wrought wire clasps will be post-soldered, not cast to the framework, to avoid overheating of the clasp.
 - 2.1. Wrought wires will be placed where indicated.
 - 2.2. Wrought wires will only be utilized in edentulous spaces of at least 10 mm. This will allow us to post-solder the wire far enough away from the retentive portion to avoid overheating the wire.
 - 2.3. The ADL officer will determine the gauge and type of wrought wire to be used, if not specifically requested.
3. Requests for I-bar retention will be constructed using the RPI concept, unless otherwise requested.



USAFE Sembach Area Dental Laboratory

“Ruck Zuck” Submission Standards

1 November 2000

FIXED PROSTHODONTICS

Must include a properly completed DD Form 2322 (3 copies) and the following:

- Master Cast:
- master dies and adjacent teeth dual pinned, and sectioned for removal; dies trimmed, marked margins, die hardener and spacer placed.
 - **In-Ceram:** do not apply die spacer.
 - **RBFPD:** do not pin or section, submit as a solid cast.
 - **Triple Trays:** must be mounted on appropriate articulator, pinned and sectioned according to above specifications.
 - **Porcelain Veneers:** impression, solid cast (do not pin dies) based with margins exposed and marked.

Solid cast

- in impression: - pour this cast into the impression, ship the solid cast and impression together.

- Opposing Cast: - accurate, based cast with nodules removed.

Occlusal

- Registration: - if adequate occlusal contacts exist to hand articulate, then place orientation marks on the master and opposing casts. If there are inadequate contacts, then submit an occlusal registration made with a stable media (wax records are unacceptable).

Esthetic

- Guidance: - required for all multiple anterior and some posterior cases. Types of guidance might include diagnostic wax-ups, pre-op casts, custom shades, photographs, incisal edge/cuspal position, midline, and custom incisal guide table.

REMOVABLE PARTIAL DENTURES

Must include a properly completed DD Form 2322 (2 copies) and the following:

- Master Cast: - accurate, based cast trimmed according to AFP 162-6. Do not draw design on master cast. Maxillary casts must have vibrating line and hamular notch marked.

- Diagnostic Cast: - must be surveyed with tripod marks. RPD design should be drawn on this cast.

- Opposing Cast: - accurate, based cast with nodules removed.

Occlusal

- Registration: - if adequate occlusal contacts exist, to hand articulate, then place orientation marks on the master and opposing casts. If there are inadequate contacts, then submit an occlusal registration made with a stable media (wax records unacceptable).

Esthetic

- Guidance: - If requesting RAPs or Tube Teeth, the teeth and matrix must accompany the case.

COMPLETE DENTURES

Must include a properly completed DD Form 2322 (2 copies) and the following:

- Master Cast: - accurate, based cast trimmed according to AFP 162-6. Post Palatal seal must be placed on cast by submitting dentist. Casts must be indexed and mounted on articulator.

Immediate Dentures: - submit periodontal chart AF 935 A (or equivalent) or mark reduction levels on master cast. If requesting surgical templates, please indicate so.

Overdentures: - mark the teeth to be retained as overdenture abutments and the level of abutment tooth reduction.

Esthetic

- Guidance: - Tooth shade and mold enclosed, denture base shade; wax occlusion rims should be marked with high lip line, midline and corners of mouth.

ORTHODONTIC APPLIANCES

Must include a properly completed DD Form 2322 (2 copies) and the following:

- Master Cast: - accurate based cast trimmed according to AFP 162-6. Appliance design should be drawn on the master cast.

- Opposing Cast: - accurate based cast with nodules removed. Orientation marks placed on cast.

USAF ADL Fixed PFM Design Options

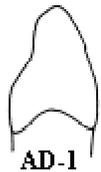
Developed by Peterson Area Dental Laboratory DSN: 834-1600

Provider: _____

Patient: _____

Anterior Design (AD) Options

Porcelain Margins



AD-1



AD-2



AD-3



AD-4

Metal Circumferential Margins



AD-5



AD-6



AD-7



AD-8



AD-9

AD-10



Draw
Your Design

AD-_____

Make Your
Selection

Anterior Pontic Design (APD) Options

APD-3



APD-1

Modified
Ridge Lap



APD-2

Ovate, Filling
Tissue Depression



Draw
Your Design

APD-_____

Make Your
Selection

Posterior Design (PD) Options

Porcelain Margins



PD-1



PD-2



PD-3



PD-4

Metal Circumferential Margins



PD-5



PD-6



PD-7



PD-8



PD-9

PD-10



Draw
Your Design

PD-_____

Make Your
Selection

Posterior Pontic Design (PPD) Options

PPD-6



Perel



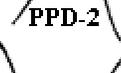
Hygienic



Bullet



PPD-3



Mod.
Ridge
Lap



Ovate

PPD-4

PPD-5



Draw
Your Design

PPD-_____

Make Your
Selection



Sembach Area Dental Laboratory Information Letter

Volume 6, Issue 1

Sembach AB, Germany

20 April 2001

Greetings from the Sembach ADL. I would like to thank everyone for their efforts in complying with our laboratory submission standards over the last few months. The number of cases in compliance with our standards has significantly improved, which means a faster turn-around time for you and your patients. This also allows our technicians to give you a higher quality product in a shorter time period; it is definitely a win-win situation for us all, so keep up the good work!

Many of our customers have expressed positive feedback regarding the case tracking capability on our web site. If you were not aware of this feature, please visit our web page for this valuable service. We are updating the database page every two days instead of once every week because of your desire for this timely information. Our fabrication times are also posted to give you an approximate time to finish your cases. Please allow more time for full mouth rehabilitations.

If you have not been tracking precious metals prices, then you should be aware that the cost of palladium has increased 805% in the last five years. We currently use a gold palladium alloy for our ceramic restorations and have noticed a significant increase in the cost of this alloy, which contains 38.5% palladium. We will be testing a high gold alloy for our single unit porcelain fused to metal restorations in hopes of realizing a cost savings. The high gold alloys were once the alloys of choice for metal ceramics years ago but became cost prohibitive due to soaring gold prices. Now, with the cost of gold being one-fourth the cost of palladium, many laboratories are considering them once again as an alternative. More to come on this subject!

//signed//

RANDALL C. DUNCAN, Lt Col, USAF, DC
Area Dental Laboratory Flight Commander

CURRENT CASE TURN-AROUND TIMES:

FIXED DEPARTMENT: 13 days
FRAMES DEPARTMENT: 18 days
ACRYLIC DEPARTMENT: 4 days

Note: The most current turn-around times are published and updated weekly on our website. Click on the metrics button.

ADL WORKSHOP – CALL FOR PRESENTATIONS

The Sembach Area Dental Laboratory will be hosting its annual Workshop the 11, 12, and 13 of September 2001. If you would like to present a lecture, table clinic, or teach a hands-on course, we would be happy to help you get involved. For more information, please contact LTC Randall Duncan, ADL Director or LTC William Dinse, ADL Assistant Director, DSN:496-6530/7549



FIXED ELEMENT

NEW ARTICULATORS

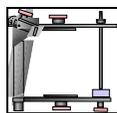
The Sembach ADL has recently purchased several Whip Mix model 3140 and 2240 articulators with the Accumount mounting system. This system allows you to mail your mounted casts directly to us without making lateral straps and occlusal registrations, which is

cost effective for the Base Dental Lab as well as the ADL. In addition to this, you don't have to worry about damaging or losing your articulator in the mail. It also allows the dental officer to evaluate the mounted case as it will be constructed, thereby eliminating a potential mounting error for the receiving laboratory.

When submitting cases using this articulator system, be sure to let us know whether to use a model 2240 or a 3140 – the casts will cross mount accurately onto both models, but the condylar housings (and therefore condylar movements) are different.

An article was published in the September 2000 issue of Journal of Prosthodontics titled Interchangeability of Semiadjustable Articulators After 2 to 7 Years of Use. Whip Mix uses a jig referred to as Whip Mix #2245 check system to verify the accuracy of the articulator. The conclusion of the article was that the Whip Mix #2240 articulator can remain interchangeable during clinical use for 7 years, but should be routinely checked for calibration.

More information on the Accumount system is available on our website.



REMOVABLE ELEMENT

REINFORCED ACRYLIC PONTICS

If you have ever made a partial denture or have seen one in sick call where the anterior teeth have fractured off, perhaps this information may be useful to you. When you restore an edentulous area, you may be used to requesting latticework or mesh in your design. In my opinion, these retention forms are mainly for unusual ridge morphology or for recent extraction sites where a relines will be required within a year.

If you have a patient with missing anterior teeth and a well healed, broad ridge, an excellent option is to use Reinforced Acrylic Pontics (RAPs). The gingival half of the lingual surface of the RAP consists of a rectangular projection of metal around which a denture tooth is processed (fig 1). The metal provides the

strength and allows for tooth replacement where space is limited.



Figure 1: Finished metal framework with RAP tooth prior to final processing.

In the following example, by using a RAP, a diastema can be produced in the set-up. Notice how the tooth is fit intimately to the edentulous ridge.



Figure 2: RAP adapted to master cast.

RAPs are indicated only for anterior teeth and perhaps maxillary first premolars.

When you use RAPs, there is an important step you must do chairside. Do your final preparations and impressions. Pour your master casts. Select your teeth and set them in a wax try-in matrix on your master cast. Try to adapt the necks of the teeth intimately to the ridge. Try-in the set up and adjust for esthetics if required. Next return your set-up to the master cast and have your technician make a matrix (stone or Triad material). Include in the matrix the incisal edges of the denture teeth and

enough of the adjacent teeth of the stone cast to ensure accurate realignment of all parts. Carefully remove the matrix and trim away the excess stone. Don't extend the matrix into areas of the master cast that are going to be blocked out (fig 3). Do not forget to send the tooth or teeth with the matrix!

There is a problem with the set-up in figure 3. Instead of adapting the tooth intimately to the ridge, the tooth was overzealously ground and will require excessive acrylic to fill in the gap between the tooth and ridge. In this case, I believe that the dentist was trying to match gingival levels between teeth 8 and 9. A more ideal result may have been gained using ridge augmentation surgery. It is difficult to match gingival acrylic shades in this esthetically demanding area of the mouth. This was a difficult case!

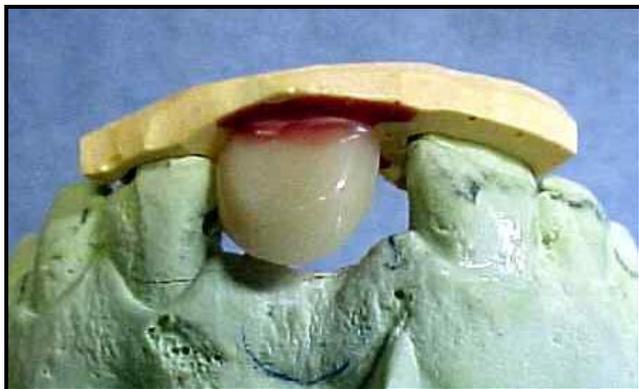


Figure 3: RAP tooth, which has been excessively adjusted at the cervical area.

When you submit your design cast to the ADL the drawing on the cast should look similar to figure 4. We request that you draw your design on a surveyed diagnostic cast before you prepare the teeth. This will help verify adequate undercuts, check clearances for rests, and allow you to approach the preparation appointment with confidence. You have thought out the case and have actually designed it on a three-dimensional cast. A quick 2-D drawing on a DD Form 2322 may save time but it only conveys a half-baked prescription.



Figure 4: Designed cast with RAP prescription.

The advantages of RAPs are that they provide excellent strength and esthetics, and are useful in areas of restricted space. The limitation of RAPs is they cannot be relined so they are contraindicated for unhealed ridges.

QUALITY CONTROL FORMS – HELP US HELP YOU

Please return your QC forms (ADL Form 48B). To keep accurate metrics and help us do a better job for you, simply fill out the form and place them in the shipping box with your next case submission. Currently, only 33% of these forms are being returned to us, which makes it difficult to establish credible data.

Notice - We are putting together an e-mail database of our customers. Please add your e-mail address to the DD Form 2322 or send it to us at one of the above addresses. This helps us correspond quickly with our customers and helps turn your cases around quicker.

TMD HANDOUT SELF CARE THERAPIES

During my prosthodontic residency, I did a rotation with Dr Edward Wright, our Air Force Consultant on TMD. I learned many valuable lessons on treating TMD patients. Attached to

the Newsletter is a hand out that he developed for patients being treated for TMD.

Feel free to print it and distribute it to your patients. I felt that this information would be valuable to you since we fabricate many Occlusal Devices (hard night guards) for our customers. Look also at our web page @ <https://wwwmil.usafe.af.mil/ramstein/86ds/adl> under the download button for the entire TMJ course manual in an easy to use PDF format (attachments 2,3, and 4).

CASE SUBMISSION TIP

When entering a combination fixed and removable case into the lab, use 2 different DD Form 2322's to allow faster production in the ADL. The case can then be split into 2 separate case submissions and be simultaneously fabricated. This however depends on the occlusal demands of your reconstruction. If the occlusion of the RPD, for example, depends on fabricated fixed in the opposing cast, then this will not work. It will take longer.

NEED SHIPPING BOXES?

If you in need of shipping boxes, we recommend the new four-slot box. This works well because many fixed cases are submitted with a master cast, opposing cast, impression, and solid cast. The four-slot box, lid and foam inserts are sold as a complete set for \$2.75 each. You can order up to 20 of the new four slotted boxes without exceeding the maximum package size for APO and FPO post office boxes. One source that we've used is:

Tharco
13400 East 39th Ave
P.O. Box 39103
Denver, CO 80239-0103
1-800-525-1831

HAIL:

SSgt Grice from Peterson AFB, CO
SSgt Brucker from Lackland AFB, TX
A1C Anderson from Edwards AFB, CA

FAREWELL:

TSgt Coon to Keesler AFB, MS
SSgt Vinson to Peterson AFB, CO

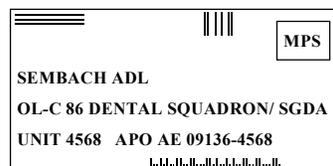
TECHNICIAN OF THE MONTH:

November: GS-9 Hill
December: GS-9 Coleman
January: SSgt Warren
February: SSgt Santos
March: TSgt Henson

Congratulations also to TSgt Henson for receiving the "Top Performer" for the 150 member 86th Dental Squadron for the first quarter of 2001.

WE MAY BE CONTACTED BY:

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//signed//

WILLIAM E. DINSE, Lt Col, USAF, DC
Editor, Information Letter

Distribution:

HQ USAF/SGD
HQ USAFE/SGD
HQ ERDC
HQ L DENTAC
HQ H DENTAC
HQ W DENTAC
ADL Peterson AFB, CO

Attachments:

1) TMD Self Care Therapies

USE OF YOUR SPLINT

The splint is designed to protect and stabilize your jaw muscles and joints, it should help you feel more comfortable and allow healing to occur. To obtain its maximum benefit, use it in the following manner:

1. Do not bite down on your splint. The splint is to help you realize when you are clenching and help you break this habit . **YOUR TEETH SHOULD NEVER TOUCH THE SPLINT!** Constantly monitor your jaw position and remember to keep your tongue up and your teeth off of the splint.
2. Most patients need to gradually increase the amount of time they wear their splint until they reach their recommended wear schedule. If your splint hurts your teeth, leave it out and come back to have it adjusted.
3. Do not wear your splint when you eat.
4. Clean the inside and outside of your splint at least daily with your toothbrush and toothpaste. It can be soaked with a denture cleaner solution to help clean it.
5. When you are not wearing your splint:
 - a) be careful where you place it, because it is very fragile
 - b) do not let it lay around, dogs and cats enjoy chewing on them
 - c) do not leave it in a warm place (i.e. inside your car on warm day), or it may warp.
 - d) if your splint will be out of your mouth for more than 8 hours, store it in a moist environment. You can place it with a few drops of water in a zip-lock bag or margarine tub.
6. Your splint may cause you to salivate more and may temporarily cause an increase in your jaw tension or joint noises.
7. When you take your splint out, your jaw may take a few seconds to adjust back to the way your teeth normally fit together.
8. Always take your splint with you when you have a dental appointment or an appointment in this clinic.

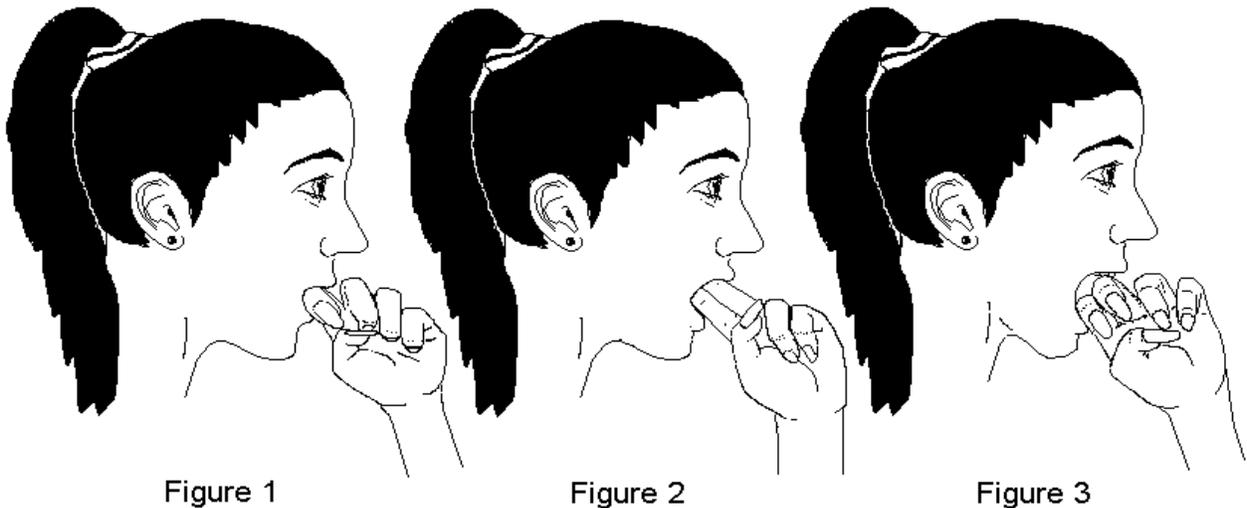
This advice should help you optimize the benefit you can obtain from your splint and maintain your oral health.

STRETCHING YOUR JAW MUSCLES

People unconsciously stretch many of their muscles throughout the day. Patients who have jaw muscle stiffness or pain often find a significant improvement in their symptoms with this jaw stretching exercise. Your dentist believes your symptoms will improve if you perform this simple jaw stretching exercise 6 times a day, between 30 and 60 seconds each time, at the opening and duration you determine best for you.

It is best to warm your jaw muscles before you stretch by slowly opening and closing about 10 times. You may also warm your muscles by applying moist heat to them (allow time for the heat to penetrate into your muscles). While stretching you need to concentrate on relaxing your lips, facial muscles and jaw. Do not bite on your fingers while stretching, they are only to give you a guide for the width you are stretching.

You will need to determine what opening and duration are best for you. To determine this, the first time you stretch, bend your index finger and place the middle knuckle between your upper and lower front teeth (see Figure 1). Hold this position for 30 seconds. If this does not aggravate your symptoms, the second time you stretch, increase the time to 45 seconds. If this does not aggravate your symptoms, the next time increase it to 60 seconds. If this does not aggravate your symptoms, increase your opening width to 2 fingertips (see Figure 2) and cut your time back to 30 seconds. Continue increasing your time and opening in this manner, but do not go beyond 3 finger tips. Find the largest opening and duration that does not cause even the slightest discomfort or aggravation of your symptoms and use this each time you stretch. If you experience any discomfort or aggravation, decrease your opening or time.



As your symptoms improve or if you have a flare-up, you will need to increase or decrease this opening and time. Be very careful not to cause yourself any aggravation with this exercise, because this may hurt your progress.

Patients report this exercise does not provide immediate symptom improvement, but takes about 1-2 weeks before benefits are noticed. Similarly, stopping does not cause immediate loss of these benefits, but also tends to take 1-2 weeks to be noticed. With the normal symptom fluctuation most TMD patients experience, it is often difficult for them to relate their symptom improvement or aggravation with the starting or stopping of this exercise.



Sembach Area Dental Laboratory Information Letter

Volume 6, Issue 2

Sembach AB, Germany

22 Oct 2001

ADL WORKSHOP

Thanks to all of the 2001 ADL Workshop participants for attending this year's meeting! It was quite an eventful week, which made it difficult on all of us, but we managed to complete 22 hours of continuing education for dentists and dental laboratory technicians. Many thanks to all the dental manufacturers and company representatives who attended this year's workshop, it would be impossible to provide such a high quality educational forum without their financial and technical support.

Although this year's workshop had the same attendance as last year, it was well attended by dental technicians but poorly attended by dentists. In order to host three days of continuing education, the ADL staff clocked in 2,043 hours of work to prepare for, and execute this event. Also, production times increase when these workshop duties are performed, which affect all ADL customers. The only way the workshop can be cost-effective is if it is well attended. To that end, the format for next year's workshop will be re-worked in an attempt to provide cost-effective continuing education for attendees in our area of support.

RANDALL C. DUNCAN, Lt Col, USAF, DC
Area Dental Laboratory Flight Commander



Electroformed Crowns

For the last several months, the ADL has been offering electroformed crowns as a service to some of our providers. Electroforming technology offers remarkable accuracy in creating thin porcelain fused to gold substructures with uniform thickness. The

advantages of this process includes an esthetically "warm" gold coping for improved esthetics, marginal integrity of 15-20 microns, and a simplified, cost-effective procedure for fabricating copings. I would like to acknowledge the great service and support of Wieland Edelmetalle (Pforzheim, Germany), who provided the training and equipment for our staff in fabricating electroformed crowns using the Auro Galva Crown (AGC[®]) system. So far we have fabricated about 50 single unit porcelain electroformed crowns with excellent results, and the feedback we have received to date from providers has been extremely positive. So good, in fact, that we have already placed a purchase request for a unit here at Sembach.

Luigi Galvani first described the fundamental principles behind the electroforming process more than 200 years ago. Within a given cell (Figure 1), it is possible to produce a chemical reaction by passing an electric current through an electrolytic solution. The result is a thin homogenous metal coating onto the cathode. By placing a specially prepared die into a gold electrolytic solution, a gold coping can be formed using this process, referred to in the literature as a galvano-ceramic crown or an electroformed crown.

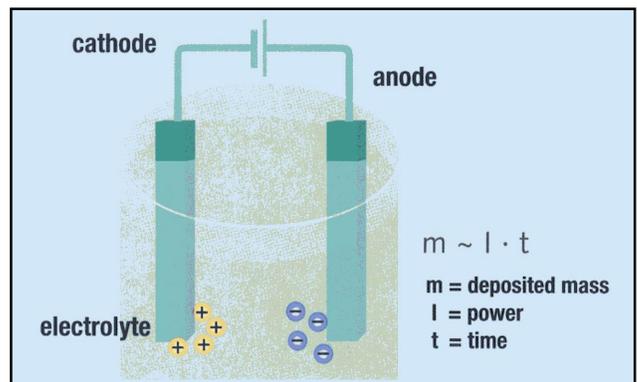


Figure 1. Electrolytic cell

Rogers and Armstrong (J Prosthet Dent, 1961) produced the first inlays and onlays by electroforming, and then later adapted the procedure to include gold copings for porcelain crowns. The electrolyte used in the process, however, was a hazardous cyanide-based solution, potassium dicyanoaurate. The toxicity of the solution made it too impractical for dental laboratory applications. Over the last decade, a cyanide-free electrolyte solution of ammonium gold sulfate has been developed, which makes it practical for dental laboratory use.

The electroforming process deposits a homogenous layer of pure gold onto a stone die with a thickness of 0.2mm or 0.3mm. Since the process does not involve the lost wax casting technique, there is a considerable savings in the manpower required to produce a single metal coping as well as a 50% savings in the amount of gold utilized in the process. Not many clinical studies are available on these types of restorations, however, Erpenstein, et. al (J Prosthet Dent, 2000) demonstrated success rates of 96% and 92% in the posterior and anterior arches, respectively.

The electroformed coping design is limited to a full porcelain veneered restoration since you cannot “electroform” an occlusal contact. The only option in the framework design you have is the marginal material (Figure 2): a porcelain shoulder, or an electroformed 0.3mm margin. Since noble metal copings are more subject to creep, we prefer to use the 0.3mm setting when electroforming these copings.



Figure 2. Coping with porcelain facial margin

Electroformed crowns are made of pure gold, which has a melting point of 1064.43° C, and a coefficient of thermal expansion (CTE) of $14.4 \times 10^{-6}/^{\circ}\text{C}$. This is well matched with the CTE of Vita Omega porcelain, which is $13.6 - 13.9 \times 10^{-6}/^{\circ}\text{C}$. The electroformed metal has a uniform molecular structure that allows it to

remain stable at porcelain firing temperatures (Vence, J Prosthet Dent, 1997).

Indications for electroformed porcelain crowns include single unit crowns, fixed partial dentures, implant suprastructures, telescopic crowns, partial crowns (inlays and onlays), and denture bases. At the present time, the Sembach ADL will only be constructing single unit crowns and partial crowns.

The preparation for crowns is very similar to the conventional PFM crown preparation. Unlike conventional preparations, however, there can be absolutely no undercuts present on the die. Circumferential tooth reduction should be at least 1.2mm with an incisal reduction of 1.8 – 2.0 mm incisal (Diedrichs, Galvanoforming, 1995). Be careful with the marginal preparation of the teeth and dies that you submit for this type of coping, because you will receive exactly what you prepare! Therefore, do not apply die spacers or hardeners to your master dies, we will perform those procedures for you.

The electroformed process involves the duplication of the master die with a subsequent application of a conductive silver varnish (Figure 3). The varnish is painted on the duplicated die only in the areas to receive metal from the electroforming process. The die is then placed

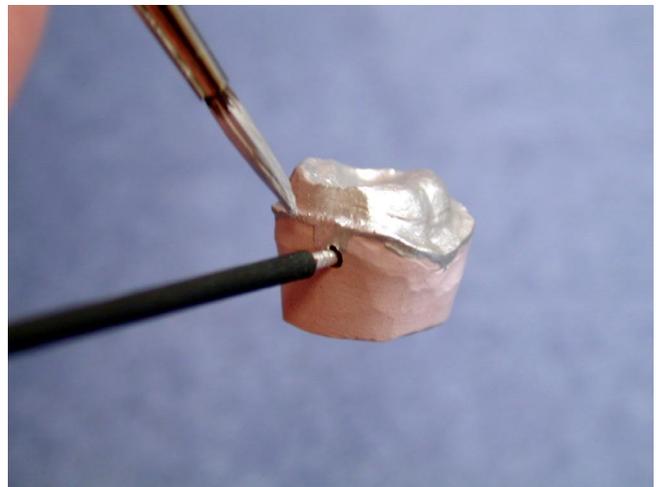


Figure 3. Application of conductive layer

into the electrolytic solution for the process to take place, which takes anywhere from 1 – 8 hours depending on the machine used (Figure 4). After the coping is fabricated, the conductive layer is removed from inside the coping, then the metal is finished and ready for porcelain application. Most porcelain systems are compatible to gold and can be placed with a thin

opaque layer. We are currently using the Vita Omega and Omega 900 systems on the gold coping after it has been thoroughly sandblasted with 110-micron sized aluminum oxide.



Figure 4. Dies being electroformed in ammonium gold sulfate electrolytic solution.

If you are interested in further information about electroformed crowns, or would like to discuss clinical indications for use on your patients, please contact me at the ADL at the e-mail below.

Randall C. Duncan, DDS, MS
 Director, Sembach ADL

COMCO MICRO-BLASTER



Figure 5. Comco unit

conceptions concerning the use and maintenance of this machine.

Recently, we have received inquiries regarding the maintenance and operation of the Comco Micro-Blaster (Figure 5). Many laboratories throughout DoD utilize this type of unit, unfortunately, the instruction manual is not very user friendly. Therefore, here is my attempt to clarify any mis-

Most people in the laboratory are not aware that when a dual tank Micro-Blaster is ordered from Comco Inc., two different sized tank orifices are standard with the machine. The left tank is fitted with the larger 0.040", and the right tank is fitted with the smaller 0.025" orifice (Figure 6). The recommended particle size to use with each tank orifice is listed in the table below.



Figure 6. Tank Orifices

Most laboratories use between 50 and 110-micron sized aluminum oxide particles as well as glass beads, which are usually 80 microns in diameter. For non-precious and high gold alloys, manufacturers even recommend 210-micron sized aluminum oxide to treat the metal before porcelain application.

Orifice Size	Recommended Particle Size
0.040"	80µ -250µ
0.025"	25µ - 110µ

According to the manufacturer in Burbank, California, the maximum sized abrasive particle recommended for the tank with the 0.025 orifice is 110-microns. The maximum size particle recommended for the tank with the 0.040 orifice is 250-microns. The tank itself is fitted with a single orifice at the bottom through which all powder must pass. Other factors being equal, the amount of powder flowing is directly proportional to the area of this opening. Some judgment is required in selecting an orifice size since particle size, pressure, and nozzle size affect the total particle flow. Two other orifice sizes are also available depending on your specific needs: 0.018", and 0.032".

Powder flow control is an important variable to be concerned about. If you are thinking along the same lines as I am, the powder flow control would lead you to believe that adjusting this item would adjust the amount of abrasive being used. Regardless of the cutting speed, a constant amount of abrasive will flow from a given size orifice. The powder flow adjustment is not meant to increase or decrease the amount of abrasive, but to add more or less

air to the mixture. With our machines cutting at 80 psi, adjusting the powder flow is barely noticeable.

The nozzle chart in the manual explains which abrasive nozzles correspond with the appropriate orifice and abrasive. The abrasive chart matches the abrasive size with tank orifice and minimum nozzle size. We basically use three nozzles in our application, the violet (0.018”), green (0.030”), and yellow (0.046”). Periodically inspect the nozzle orifice for wear (Figure 7); they will always wear out depending on the abrasiveness of the particle, the particle size, the pressure used, and the amount of usage.

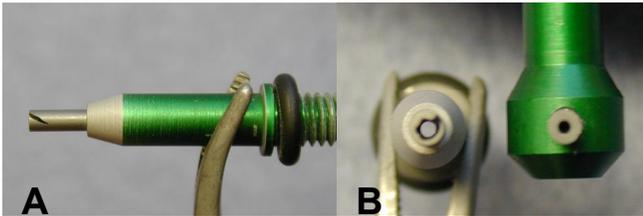


Figure 7. A – Worn abrasive nozzle with wear extending through the side. **B** – Both orifices are 0.030”: the nozzle orifice on the right side in new, while the one on the left side exhibits excessive wear.

To maintain peak performance of your machine and suction unit, the following maintenance should be accomplished on a regular basis. According to the manufacturer, the hoses on the back of the unit should be moved periodically at the pinch valve assembly. Inspect these hoses weekly for any soft spots near the pinch valve. If any are found, the hose should be cut back to that point and reattached to the fitting. The suction unit should also be cleaned appropriately once a week depending on usage.

By no means am I an expert on this expensive piece of equipment, but if you have any questions concerning it I would be glad to try to answer them.

*Robert Henson, CDT
Fixed Prosthodontic Element Leader*



REMOVABLE ELEMENT

Please help us expedite your cases through the ADL. Always refer to the *Ruck-Zuck* form before shipping your cases to ensure that you have included everything we will need to immediately begin fabricating your requests upon their arrival at Sembach. Here is a short list that will help us help you:

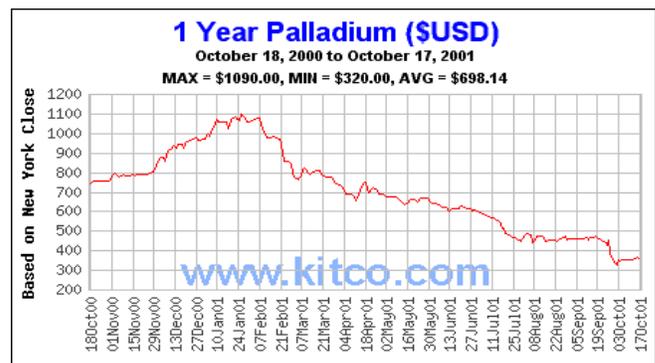
- Ensure the accuracy of impressions and/or casts.
- Ensure that casts are free of bubbles, nodules, and voids.
- Ensure that the cast is based, and that the base is at least 10mm thick.
- Ensure that an opposing cast is sent.
- Do not place design on master cast. Place the design on a surveyed diagnostic cast.
- Give accurate, precise and legible instructions on the DD Form 2322.
- Cyanoacrylate placed over master cast tripod markings may distort the cast. Please tripod the diagnostic cast, we will transfer the marks to the master.
- Ensure that the case is properly packaged to avoid damage from shipping.

If you have any advice that could aid us in better serving you please feel free to contact myself via e-mail.

*Darren K. Low
Removable Prosthodontic Element Leader*

NOTEWORTHY ITEMS

Palladium Prices Return to Normal



In what started out as a turbulent year for the palladium market, it appears that it has finally stabilized. Russia produces two-thirds of the world's supply of palladium, which is used mostly to manufacture catalytic converters for the automobile industry. Another contributing

factor to the winter price fluctuations is the fact that the mines are located north of the Arctic Circle...simply a matter of supply and demand.

Where Have All the Shipping Containers Gone?

If you have any extra boxes at your facility, PLEASE return them to the ADL. Last year we purchased and distributed an additional 450 new boxes throughout EUCOM (4-slot containers). Today we have only 12 containers left! Although the ADL has purchased most of the containers in the past, our budget no longer enables us to do so. To that end, each facility is responsible for purchasing their own containers. If you would like more information on ordering boxes, please visit our web site.

Metal Case Pans

We have approximately 100 extra laboratory case pans that are not being used...if you have a need for case pans, please contact us and we will be happy to ship them out to you.

Laboratory Prescriptions: DD Form 2322

We have received many unauthorized laboratory prescription forms over the past several months. Dental laboratory prescriptions are only acceptable if they are submitted on the DD Form 2322, IAW AFI 47-101, Chap. 7.5.; AFI 33-360 directs the control of this form, therefore you may not create your own version of the form. If you are out of forms, please order them from the AF Pubs web site or use the DoD electronic PDF form, which is available on our web site. The PDF form is very easy to use (it even calculates the precious metal debits and credits), but you must print out the form on a printer with duplexing capability.

CONGRATULATIONS!

TECHNICIANS OF THE MONTH:

April: SSgt Santos; May: SrA Keene
June: TSgt Low; July: SSgt Brucker
Aug: TSgt Low; Sep: SSgt Hall

2nd Quarter Award Winners

SrA Keene has won the Dental Squadron and Medical Group Amn of the quarter for the second quarter.



Quarterly Award Winner: SrA Keene

TSgt Henson was selected as the ADL NCO of the second quarter.

3rd Quarter Award Winners

TSgt (sel) Shauna Brucker won the Dental Squadron and Medical Group *NCO of the Quarter* for the second quarter, while Mrs. Linda Evans won the Dental Squadron and Medical Group *Civilian (Category 1) of the Quarter*.



Quarterly Award Winners: Mrs. Evans and TSgt(sel) Brucker

Other Awards

TSgt (sel) Stacy Grice and SSgt Leonard Fowler each were awarded 86th MDG *Hero Award* for their outstanding support of MDG readiness exercises.

CURRENT CASE TURN-AROUND TIMES:

FIXED DEPARTMENT: 30 days
FRAMES DEPARTMENT: 22 days
ACRYLIC DEPARTMENT: 5 days

Note: The most current turn-around times are published and updated daily on our website.

WE MAY BE CONTACTED AT:

<https://wwwmil.usafe.af.mil/ramstein/86ds/adl>

Randall.Duncan@sembach.af.mil Flight CC

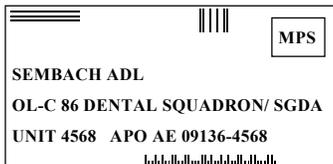
William.Dinse@sembach.af.mil Asst. Flight CC

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Victor.Brady@sembach.af.mil NCOIC

Robert.Henson@sembach.af.mil Fixed Element

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//signed//

RANDALL C. DUNCAN, Lt Col, USAF, DC
Sembach ADL Flight Commander



Sembach Area Dental Laboratory Information Letter

Volume 7, Issue 1

Sembach AB, Germany

31 January 2002

Comments from the Commander

From the entire ADL, a belated Happy New Year to all! We had a cold, white Christmas here at Sembach as many of you did stationed throughout Germany. Our usual holiday workload increase never materialized, so our turnaround times have improved remarkably. So, now is the time to send your laboratory work to the ADL.

Please congratulate Lt Col Will Dinse on successfully challenging the American Board of Prosthodontics examination in November. Although there are monetary rewards for becoming board certified in your specialty, such as promotion and special pays, the personal and professional rewards are truly immeasurable. When challenging your specialty boards, you enter into the final phase of your training, which can be more intense, and time consuming than the training you received as a resident. To achieve Diplomate status is truly a great accomplishment. Kudos to everyone who has completed, or is in pursuit of completing their specialty boards.

There has been an increase in the number of digital photographs submitted with cases here at Sembach. The usage of this new technology has significantly enhanced communication efforts between providers in the field, and the lab technicians in the ADL. We encourage the use of this tool since digital photographs can be so easily transmitted back and forth via e-mail. To that end, I am attaching an article on digital photography by Lt Col Alan Sutton (Lackland AFB, TX), which you may find helpful.

RANDALL C. DUNCAN, Lt Col, USAF, DC
Area Dental Laboratory Flight Commander



Shoulder Margin Preparation Tips

We receive a fair number of crown submissions that have less than ideal shoulder preparations. Among the most common problems we encounter here at Sembach are inadequate tooth reduction for porcelain, and rough marginal finish lines.

The shoulder preparation is not that difficult if you follow a few basic guidelines. Begin preparing the shoulder with a round-ended diamond bur, instead of the traditional flat end diamond. This allows the operator to follow the contour of the tooth without having to turn the wrist to negotiate the “scallop-shaped” facial surface of anterior teeth. The rounded bur also creates a rounded internal line angle, which allows for a better casting and reduces the internal stresses for the tooth. A flat end diamond is then used to refine the shoulder. If the margin is subgingival, retraction is necessary before the shoulder is refined.



- Smooth
- Uniform
- 1.2-1.5mm width

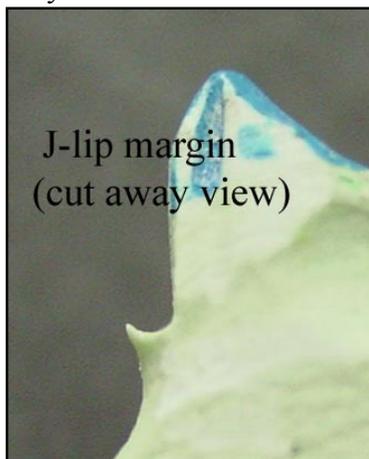
Provide adequate reduction. Generally the distance from the pulp chamber to the CEJ is great enough to easily allow for a **1.2-1.5mm** shoulder preparation (Ingle - 1985). The preparation must have enough tooth reduction to allow for a porcelain thickness that will esthetically cover the metal yet be thin enough not to impinge on the tissue. To esthetically cover the metal, there must be at

least 1mm of porcelain thickness to achieve a lifelike appearance. Reduction that is less than this results in an unsightly opaceous halo.

Know the dimension of your cutting instrument to gauge the *adequacy* and *uniformity* of reduction. A 1.0 mm wide enamel hatchet or Wedelstaedt chisel may be used to plane the surface of the shoulder and to check its width.

Use a tapered, flat cylinder to make the shoulder flat and smooth. A

commonly encountered problem here at the ADL is what Dr. John Kois refers to as “j-lipping”. To prevent j-lipping use, for example, a Brassler 6856-33-027 Course Round End Taper wide diameter diamond on slow speed (Brassler USA, Savannah, Georgia, 912-925-8525).



Extend the margins properly. Take the margin far enough beyond the mesial facial line angle into the interproximal space to avoid an unesthetic metal collar. If possible, end your margins at the gingiva or ½ mm below. Using 3-0 cord can help you visualize the sulcus and provide slight retraction.

For economic reasons, we don't recommend shoulder porcelain for **mandibular** second bicuspid and molars. It takes more time in the laboratory to construct these and this is not in the esthetic zone. Only in unusual situations will the margins of these teeth be visible.

By following these guidelines, you should be able to create shoulders that laboratory technicians can use to easily fabricate your porcelain margins.

Utilization of Microscopes in the Dental Laboratory

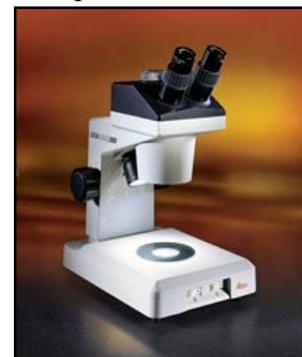
To provide high quality restorations, we use microscopes in the laboratory during the fabrication process. The advantages of using magnification while constructing dental prostheses is that it enables you to better

visualize the waxing, seating, and finishing processes than the naked eye. It also allows you to better examine solder joints, areas of porosity, and surface textures of various materials. And lastly, it enables you to better evaluate the marginal integrity of the restoration. If you do not have microscopes in your laboratory, and are considering obtaining this capability, the following information will bring you up to speed.



Basic Construction:

You'll want a sturdy, well-built frame on your scope. The best are made of metallic alloys that minimize vibration, and experience minimal fluctuation with temperature variations. There are two categories of microscopes. One is mounted on a base that rests on a tabletop; the second is boom mounted. From an ergonomic standpoint, we recommend the boom-mounted model but personal preferences may vary. The advantage of the boom-mounted microscope is that it allows a working area between the lens and the desktop for lab fabrication processes. The elimination of the base of the microscope allows freedom of movement of the workpiece and bench engine. The disadvantage of the boom is the cost and the necessity of being mounted to the bench.



Optics:

As you might imagine, the optics, or lenses, are the most important component in a good microscope. Remember, however, they are just a part of the whole package. Great lenses must be supported with a quality focus system, therefore, consider and evaluate a scope as a whole unit.

Purchase a scope that adheres to the DIN threading standard. The DIN (Deutsche Industrie Norm) is an international standard for



microscope objective lenses. That way should you lose or damage one of your objective lenses, you could replace it with a lens from nearly any microscope company in the world.

Another important term relating to optics is “achromatic”. The lenses are constructed to be “color corrected”. Each lens on a microscope is actually a unit built with as many as ten glass lenses. If the design and construction is not done properly, some colors can be reflected out of the focal plane, and thus are unseen. If the lens is not color corrected, there are things that you simply will not see with your microscope. Achromatic lenses are color corrected. This is a feature you must have if you plan to make photomicrographs.

Eyepieces:

The eyepiece, also called the ocular, is the lens closest to your eye. A “wide field” eyepiece is the choice recommendation. On a wide field eyepiece, the lens opening is significantly larger than one that isn’t wide field. It is easier to position your eye to see into a wide field eyepiece. Some microscopes accommodate eyeglass wearers. Imagine trying to peer into a box through a pinhole. It would be pretty tough. Now think about trying to look in a hole drilled with a half-inch drill. The larger the hole is, the



easier it is to see within. It is the same way with a microscope. The lens in a wide field eyepiece is generally as large as a US dime. This makes it easier to position your eye for viewing.

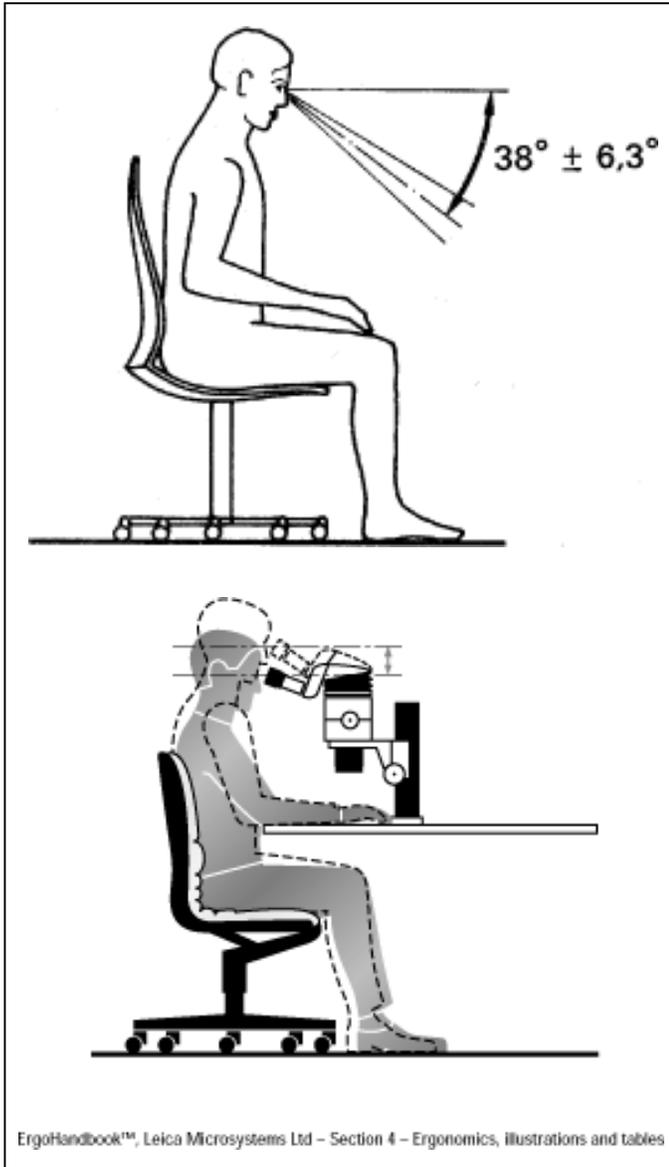
Also consider your seating posture while looking through the eyepiece. Ergonomics is key during long use periods; you must be able to sit at your bench and be able to look through the eyepieces comfortably. The scope must “meet your eyes” while you are properly seated at the bench.

Proper posture at the workstation is essential to reduce aches and pains associated with muscle fatigue and increases worker productivity. Many desktop microscopes used in today’s dental laboratories do not readily conform to laboratory work processes. When the instrument is placed on top of the bench, many technicians must position the chair at a higher than usual position in order to look through the eyepieces. The technician in the photo to the right has his chair in its highest position and still must sit on his leg in order to reach the proper eyelevel for the microscope. Another option for the technician is to position the instrument in a

drawer in order to look through the eyepieces. These positions are not only uncomfortable, but they also deprive the technician of the use of proper ventilation and adequate working space for bench engines.

The most favorable angle of observation for the eyes is $38^{\circ} (\pm 6^{\circ})$ below the horizon. An angle of observation that is inclined too steeply upwards or downwards will cause neck fatigue.





Look for a microscope that allows adjustments of working distance and viewing height without having to change out the lenses. The photo of the ErgoTube™ to the right, by Leica Microsystems, has a variable angle of adjustability of 10-50°. This allows the microscope to adapt to several different operator heights, as well as several seating positions for the same operator. Fewer microscopes will then be needed to accommodate all technicians in the laboratory.



Illumination:

Proper illumination is critical in viewing a good image through any stereomicroscope, especially if the instrument has a zoom lens. For dental laboratory applications, only reflected light imaging systems should be used on the microscope (light reflects off the workpiece and into the lens). Choices of lights range from a simple tungsten or florescent light bulb to the more sophisticated fiber optic delivery system using a halogen light source. By far, the fiber optic system will provide the most efficient means of lighting the workpiece and is the only system recommended for a microscope with a zoom lens. There are two basic styles of fiber optic lights; gooseneck style fiber bundles or ring lights.

The gooseneck styled fiber optic light can be adjusted to provide smaller, more intense circles of light directly at the workpiece. This type of light provides excellent illumination, especially inside cast metal restorations. To eliminate shadows on the workpiece, we recommend purchasing a two-bundled gooseneck system, which positions a bundle on each side of the microscope.

The fiber optic ring light positions a ring of multiple light ports directly above the workpiece, providing even illumination that completely fills the field of view. While this method provides less intense light than the gooseneck, it moves with the microscope as the focus is adjusted and is less likely to be in the way of your arms and instruments that need access to the workpiece.

Focus:

The focus system on a microscope brings the subject that you want to observe into the focal plane of the lenses. A microscope's focus system will have one or two focus knobs, and perhaps a "slip clutch".

Every microscope has a coarse focus. If a scope has just one focus knob, it is a coarse focus. This knob will move the subject rather quickly through the focal plane – that is, it doesn't take a whole lot of turning to get something in focus.

There are two basic ways you can examine objects under a microscope: The conventional “fixed” lense provides the viewer with fixed, or pre-set magnifications.

Newer zoom lenses provide the viewer with a range of magnifications to view the work piece. Zoom lenses are ideal for the dental laboratory technician that provides a level of magnification suited to the job at hand. These multiple magnifications are essential to meeting the needs of technicians who are engaged in the many processes of laboratory prosthesis construction. The only disadvantages are the cost, and the fact that they require more light to illuminate the field. Halogen is the only acceptable light source for zoom lenses.

Here at the ADL we have been upgrading our laboratory microscopes. A few brands that we found promising are Leica Microsystems and Visions.

TSgt Shauna Brucker
Section Leader, Metal Finishing



REMOVABLE ELEMENT

RPD Alloys

Many alloys have been used to fabricate Removable Partial Denture (RPD) frameworks. Historically, type IV gold alloys were used because of their high accuracy and ease of manipulation. Base metal alloys, however, have completely replaced gold alloys because of their lower cost and adequate mechanical properties. A cobalt-chromium alloy by the name of Vitallium was introduced in 1930, and since then, others alloys have been developed using various combinations of cobalt, chromium, and nickel along with other trace elements.

Over the last two decades, titanium has been experimentally used as a casting material for frameworks. It has the advantages of being light and strong, however, it must be cast at extremely high temperatures with special casting

units in an inert atmosphere. One of the problems with this metal is its low density, which makes it difficult to achieve void-free castings. For these reasons and others, it has not gained widespread use in the dental laboratory field.

Nickel-chromium alloys (e.g. Ticonium Premium 100®) have been the mainstay for RPD frameworks in USAF military dental laboratories. It is easy to cast, has excellent mechanical properties, and it is relatively easy to finish and polish compared to other base metal alloys. However, a disadvantage to this alloy is that it contains nickel and beryllium. Fifteen percent of all women and two to five percent of men in the industrialized world are prone to nickel allergy, which makes this alloy contraindicated for these patients. Interestingly, Reuters reports that the new one and two-euro coins release so much nickel that people allergic to the metal could develop hand eczema.

Beryllium is an extremely stiff, lightweight metal suitable for many uses; unfortunately, it is classified as a group 1 human carcinogen and can cause lung cancer in “industrial” workers who are exposed to high concentrations. Although dental laboratory technicians are not exposed to the high concentrations as industrial workers, precautions must be taken when working with beryllium containing alloys. Chronic Beryllium Disease (CBD) may occur when people inhale the dust during grinding or inhale the vapors during alloy melting. CBD is caused by an allergic reaction to beryllium metal and can take anywhere from a few months to 30 years to develop symptoms. To prevent harmful effects, high-speed suction is mandatory for dental technicians engaged in the metal finishing process. Also adequate ventilation must be provided over the casting machine during the casting process when the alloy is brought to its melting temperature.

For nickel sensitive patients, we have used a nickel and beryllium free alloy (Vitallium®) here at the Sembach ADL for the past ten years. This is a chromium-cobalt base metal alloy, which is somewhat more difficult to cast and finish compared to the nickel-chromium alloys.

Base Metal Alloys Composition

Alloys (% of Weight)

<i>Elements</i>	<i>*Vitallium</i>	<i>**Ticonium</i>
Chromium	28	16 (16***)
Cobalt	63	--- (8***)
Nickel	---	72 (63***)
Molybdenum	6.0	5 (5***)
Aluminum	---	3 (3***)
Iron	1.0	0.5 (0.5***)
Carbon	0.3	0.1 (0.1***)
Beryllium	---	0.8 (1.5***)
Silicon	0.7	0.5 (0.5***)
Manganese	0.75	3.2 (3.2***)
Nitrogen	0.15	---

**Vitallium 2000 alloy*

***Ticonium Premium 100 Regular alloy*

****Ticonium Premium 100 Hard alloy*

These compositional differences lead to different mechanical properties compared to the nickel-chromium alloy. Vitallium® has greater tensile strength, elastic modulus (stiffness) and hardness values compared to nickel-chromium, which allows you can make a Vitallium frame slightly thinner and less bulky than a nickel-chromium frame. The main disadvantage to Vitallium is that it has more cooling shrinkage than gold and nickel-chromium alloys. This translates into more laboratory finishing time in areas where the metal framework contacts tooth structure.

When a zero-degree blackout is used in the RPD fabrication process, guide-planes and linguoplated areas must critically fit against hard tissue surfaces. This requires an exacting duplication, waxing, investing, and casting process. In addition, it requires careful and critical handling during the fitting and metal finishing process to ensure that it will meet your clinical standards. For these reasons, Vitallium is more technique sensitive and potentially less economical compared to the traditional nickel-chromium frame. One way to make the entire process easier is to design the absolute minimal

tooth contact in your RPD prescriptions. If you need assistance in designing Vitallium (or nickel-chromium) RPDs for your patients, the laboratory officers in the ADL are here for your assistance.

<i>Metals</i>	<i>Ticonium (regular)</i>	<i>Vitallium 2000</i>
Density	2	2
Yield strength (Mpa)	790	640
Elongation (%)	7.0	9.0
Elastic modulus (Gpa)	186	218

Keep Your Stones the Same

It is a common occurrence to look into a case pan here at the ADL and see a cast that has been two-stage poured with different stones. It is always best to pour casts in two stages, but using different stones can cause some unique problems.

Dental stones have different expansion rates that can cause cast separation, distortion,



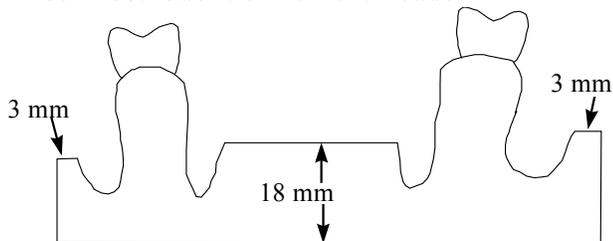
and breakage if different stones are used to pour and base the cast. If these casts are placed in the boil-out tank during acrylic processing, as in the picture above, the cast usually cracks due to the different expansion rates. This results in a precarious recovery process for us at the ADL that requires excessive time, and is never very accurate. Mixing and matching stones for whatever purpose should always be avoided for

these reasons, please use the same stone for the first and second pours of your casts.

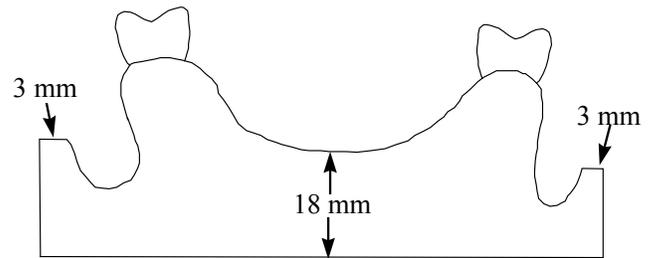
Type of Gypsum	Expansion Rate (%)
Type I – Impression Plaster	0.15
Type II – Model Plaster	0.30
Type III – Stone	0.20
Type IV – High Strength Stone	0.10
Type V – High-Strength, High-Expansion Stone	0.30

A two-stage pouring technique provides the most accurate cast with the hardest occlusal surfaces. During the first pour of the impression, the anatomic portions are covered, including the vestibular borders, and the top surface is covered with large nodules of stone to provide retentive areas for the second pour. The tray should be suspended by the handle during the set, do not lay it on the bench top. After the initial set, the impression can be immersed in supernatant slurry water for 3 to 4 minutes, excess water blown away, and a base added of the *same* kind of stone made with the *same* water/powder ratio. Stone is vibrated into the retentive areas, and the impression is inverted into a patty of stone on a smooth surface on the bench top. Excess stone is removed and the sides smoothed with a minimum of manipulation. Separate the impression after 45 minutes to 1 hour following the first pour of stone. Early or late separation can distort the cast surface. Trim the cast to the following specifications after soaking it in a solution of saturated calcium sulfate dihydrate solution (slurry water) for five minutes.

TSgt Robert Henson
Fixed Prosthodontic Element Leader



MANDIBULAR CAST



MAXILLARY CAST

CONGRATULATIONS!!!

TECHNICIANS OF THE MONTH:

October: TSgt Darren Low

November: TSgt Shauna Brucker

December: SSgt William Devine



MSgt Larry Borgeson

- 86th Dental Squadron SNCO – 4th Quarter;
- 86th Medical Group SNCO – 4th Quarter;
- 86th Dental Squadron SNCO of the Year, 2001

TSgt Darren Low

- 86th Dental Squadron NCO – 4th Quarter;
- 86th Medical Group NCO – 4th Quarter, 2001



TSgt Shauna Brucker

- 86th DS NCO of the Year, 2001;
- 86th Medical Group NCO of the Year, 2001



Mrs. Linda Evans

- 86th Airlift Wing Civilian (Category 1) of the Quarter;
- Kaiserslautern Military Community Civilian (Category 1) of the Quarter;
- 86th Dental Squadron Civilian of the Year, 2001

NEW DIPLOMATE

Lt Col Dinse - successfully challenged all phases of the American Board of Prosthodontics

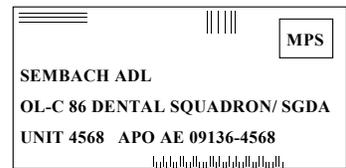
CASE TURN-AROUND TIMES:

FIXED DEPARTMENT: 13 days
 FRAMES DEPARTMENT: 18 days
 ACRYLIC DEPARTMENT: 3 days

Note: The most current turn-around times are published and updated daily on our website.

WE MAY BE CONTACTED AT:

- <https://wwwmil.usafe.af.mil/ramstein/86ds/adl>
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- Larry.Borgeson@sembach.af.mil Supt.
- Victor.Brady@sembach.af.mil NCOIC
- Robert.Henson@sembach.af.mil Fixed Element
- Darren.Low@sembach.af.mil Rem. Element



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//signed//

RANDALL C. DUNCAN, Lt Col, USAF, DC
Sembach ADL Flight Commander

//signed//

WILLIAM E. DINSE, Lt Col, USAF, DC
Sembach ADL Assistant Director

DIGITAL PHOTOGRAPHY

ALAN J. SUTTON, Lt Col, USAF DC



Digital photography is becoming very popular. The application to dentistry offers many advantages. Digital photography allows for photographic freedom and immediate review of pictures. Pictures are easily distributed and this saves money. Most cameras have a small LCD screen so that the pictures can be reviewed and poor pictures can be deleted. The digital photographs can be directly placed in continuing education presentations without having to wait for them to be processed by a photolab. Inserting pictures can be accomplished even on the day of the lectures. Another advantage is that the pictures can be easily distributed. In the near future, dentists will likely be doing more teleconsulting and teleconferencing. These consultants could be e-mailed pictures and/or radiographs for review, without the referring dentist having to travel to the consultant's office.

The most common questions I receive about digital cameras and photographs include: 1) are the pictures photo-quality, 2) what is a good resolution, 3) what format are images stored in, 4) how large of a storage card do I need and 5) do these cameras have macro focus?

1. To begin, digital cameras capture images using a solid-state device called an image sensor. The most common sensors are based on the CCD (Charge-coupled device) technology. These sensors are about the size of a dime. On the surface of the sensor are thousands or millions of photosensitive diodes. Each diode captures a single pixel of information, the more diodes, the higher the resolution. Each diode (pixel) uses different filters: red, green and blue, to create color by using the Additive Color System. Newer sensors are generally larger; some cameras have CMOS (Complementary Metal Oxide Semiconductor) sensor. Digital camera sensors are typically described in two ways: by their cross-sectional number of pixels or by the total number of pixels. Cameras can be described as having 1600 x 1200 pixels of resolution or as being a 2.1 megapixel camera. The greater the number of pixels, the higher the resolution, and the better the quality of the image. Also, the higher the resolution, the larger the resultant photo-quality prints.

2. What is a good resolution to use? This depends on the parameters of the project. Cameras with a resolution of 2.1 megapixels will produce an 8" x 10.5" photo-quality print, if using a photo-quality printer. This level of resolution is also acceptable for PowerPoint presentation using a digital projector with the resolution of 1024 x 768 pixels. For images to be sent on the



Internet a lower resolution will make the file size smaller and make the transmission of the image faster. Large images can also be compressed to make digital presentation sizes smaller (fewer megabytes) and decrease the waiting time for the images to appear. Most digital cameras have different resolution settings ranging from low quality to high quality. In addition, these cameras have multiple compression settings, typically described as basic, normal, and fine quality. Furthermore, when considering resolution, consider the resolution of your output device. If you take a high quality picture and print it with a low quality printer, the result is a low quality print.



3. What format are images stored in? The answer depends on the intended future use. Images can be stored as uncompressed or compressed files. Uncompressed files, called TIFF (Tag Image File Format), are also known as “lossless” files. These can be manipulated without significant

degradation. TIFF files are also very large, with file sizes as large as 10 megabytes or greater. These large files can quickly fill up even the largest hard drives. The most commonly used format for compressing files is called JPEG (“Jay peg,” Joint Photographic Experts Group) compression. These files are known as “lossy” files. In many situations it may be more practical to compress images. The compressed files save significant hard drive space. Many files are approximately 500 kilobytes or smaller. When these original JPEG files are uncompressed to show the picture, the human eye usually cannot distinguish the modifications. However, when the images are manipulated they may result in some loss in quality. The higher the quality, the lower the compression. Conversely, the higher the compression the lower the quality. For situations requiring the best possible result, e.g. large pictures, the TIFF format is preferred. For PowerPoint digital presentation, or family pictures, a high quality JPEG is adequate.

4. How large of a storage card do I need? Many of the newer digital cameras have increased resolution capabilities. This equates to an increase in the size of each picture

file. Most digital cameras come with an inadequately sized storage card. Therefore, if you choose to take high quality, low compression, high resolution pictures, the purchase of a new removable storage card will be necessary. There are a variety of storage media available. Most common are Type I and Type II cards, known as Compact Flash cards, Smart Media cards, or Memory Sticks. Newer cameras offer optical disks and micro-drives that have storage capacity of up to 1 gigabyte. Using 1600 x1200 resolution and then compressing this file with a high quality, fine setting (JPEG), the resultant file size is about 400 kilobytes. If your camera has a 16 megabyte card, then you can fit

approximately 40 pictures per card. The average storage capacity of digital cameras being used in the Prosthodontics Residency at Wilford Hall Medical Center is about 128 megabytes. Simply asking the sales person how many pictures you can store on the disk if the camera is set to the highest setting will give you a reasonable indication of the value of the storage disk that comes standard with the camera. I think you will find the discussion humorous.

5. Do these cameras have macro focus? Dentists must have macro. Beware, what camera shops call "macro" is not what we call "macro." Many digital cameras have the ability to get the camera close to an object and still stay in focus. This is not what we want! We want to be able to zoom in closely to an object, what is termed by some camera companies as "micro" zoom. Many of the digital cameras have the capacity to perform micro zoom, but the usually requires the camera to be set on a close-up mode and adjusting the focus so that the lens are in macro position. Each camera is a little different; so make sure you check them out fully before purchasing. Also be aware of the difference between optical zoom and digital zoom. Optical zoom results in a real-time photo. Digital zoom uses interpolation of pixels to produce an enlarged picture.



One last word about digital cameras and pictures, watch out for interpolation. As files are altered or enlarged the computer has to interpolate pixels to fill-in areas not defined by the original picture. This may result in image degradation and/or pixelation. To prevent this from happening, take photos that result in an image equal to or larger than its intended use. This means, if you are planning to make 8" x 10" prints, don't take a 5" x 7" picture and expand it using your computer. This will result in a poor quality picture.

Below are the recommended features for a Digital camera:

- User friendly
- Macro zoom capability (0.8")
 - Flash capability with macro (micro) zoom
- Focus Lock
- Auto and Manual focus options
- Adjustable F-stop capability
- Multiple resolution settings
 - Minimum working resolution = 1024x786 (approx. 1 Megapixel)
- Multiple compression settings
- Adequate image storage (64mb or higher)
- Easy to download images
- Rapid download capability
- LCD screen and view finder
 - Screen or lens rotates
- Good rechargeable batteries (NiMH or Lithium)
- AC adapter

Don't forget to back up your saved images!

Alan J. Sutton, Lt Colonel, USAF, DC
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Sembach Area Dental Laboratory Information Letter

Volume 7, Issue 2

Sembach AB, Germany

31 May 2002

Comments from the Commander

The Sembach ADL will host its annual workshop this year between October 7 – 10, 2002, IAW AFI 47-101, which will mark the Air Force's 44th year for providing a technical and professional continuing education forum to the European Theater. Although there is a to remove the annual requirement for overseas ADL workshops, the Sembach ADL remains committed to keeping laboratory technicians informed of rapidly changing dental technologies. To that end, we are planning to conduct our annual workshop as scheduled consisting of four days of hands-on technical courses, including a newly designed 2½-day implant course. This implant course will be the most comprehensive course ever offered by a DoD facility, emphasizing the most current implant components and procedures. The workshop schedule and registration form will be distributed throughout the field via e-mail in June, and will also be posted on our website. Make plans to attend now!

We have received many incomplete laboratory requests recently, ranging from missing shades to missing master casts. This creates a delay in processing your requests, and ultimately, delays patient care. All laboratory officers are required to inspect the cases prior to shipping them to the ADL to insure that all necessary information and items are shipped. Please make sure that this is accomplished to avoid delays. Also, make sure that your phone number and e-mail address is legibly written on the DD Form 2322. Many of our consultations and questions are submitted by e-mail, which is most convenient means of communication for dentists in the field and the ADL.

With the summer rapidly approaching, please plan your prosthodontic care wisely and allow for adequate clinical and laboratory time to complete your patient care. Requests for rush cases in the ADL are only honored for

deploying personnel; we cannot support the many PCS rush requests that we receive during this time of the year. This has been a problem for many decades, as noted by the poem "The Rush Job" that I discovered in an archived newsletter from the late Westover ADL. Turn-around times are posted daily on our website for your convenience. Have a safe summer!

//signed//

RANDALL C. DUNCAN, Lt Col, USAF, DC
Area Dental Laboratory Flight Commander

The Rush Job

(Reprinted from the Westover ADL Bulletin #1,
Col Wallace Urata, 1968)

*I am a rush job
I belong to no age, for men have always hurried.
I prod all human endeavor.
Men believe me necessary, but falsely.
I rush today because I was not planned
yesterday.*

*I demand excessive energy and concentration,
I over-ride obstacles, but at great expense.
I illustrate the old saying, "Haste makes waste,"
My path is strewn with the evils of overtime,
Mistakes and disappointments.*

*Accuracy and quality give way to speed,
Ruthlessly I rush on.
I am a Rush Job!*

The Quality Assurance Process

Standards of quality assurance are established in the ADL that extend to all facets of laboratory production and operation. The ADL Flight Commander, Assistant Director, Superintendent and NCOIC are the primary facilitators of quality Air Force measures, which

govern the quality review process. Laboratory production quality is measured by collecting and analyzing data pertaining to fabrication processes and products from laboratory section leaders, laboratory officers, and prescribing dentists. When work authorizations are submitted to the ADL, the provider enters into an implied agreement with the ADL that established standards (outlined in AFI 44-119, AFP 162-6, and local submission standard policies) will be met. Dentists who perform the clinical procedures assume the professional responsibility for the prosthesis/restoration. If there is a difference in professional judgment between the provider and the servicing laboratory officer, it will be resolved before fabrication of the prosthesis/restoration.

As a specialty trained prosthodontist, the ADL officer determines the fabrication standards, submission standards, and production processes used by the ADL. A peer review of all cases submitted into the ADL is conducted by the ADL officer to ensure adequate casts, a properly completed and signed DD Form 2322, complete adjunctive materials (i.e. shade tabs, matrices, drawings, etc.) are enclosed and that prosthodontic standards have been met. Since the submitting dentist may be unfamiliar with the laboratory fabrication process, the ADL officer is the dentist's representative and guides the fabrication process for their cases.

ADL submission standards are reviewed annually and distributed to all supported facilities. Work submitted to the ADL which does not meet these published standards will not be accepted for fabrication, but will be returned to the prescribing dentist with advice on how to meet the required standards.



Preparation of Dies for Fixed Prosthodontic Procedures

Accurately trimmed dies continue to be one of the most challenging tasks for dentists

submitting fixed Prosthodontic work to the Sembach ADL. Only 10% of all dies received are accurate and completely trimmed, the remaining dies have incorrectly marked margins (35%), undercuts present (20%), missing margins (5%), and marginal voids (30%). Die trimming requires meticulous handling of the stone die and a thorough background of fixed prosthodontic procedures. This is why the dentist has traditionally been responsible for accomplishing this task. Most commonly, the interproximal margins are received in a very rough, incompletely trimmed state (Fig. 1). This makes it extremely difficult to construct an accurately fitting margin to the die. A brief

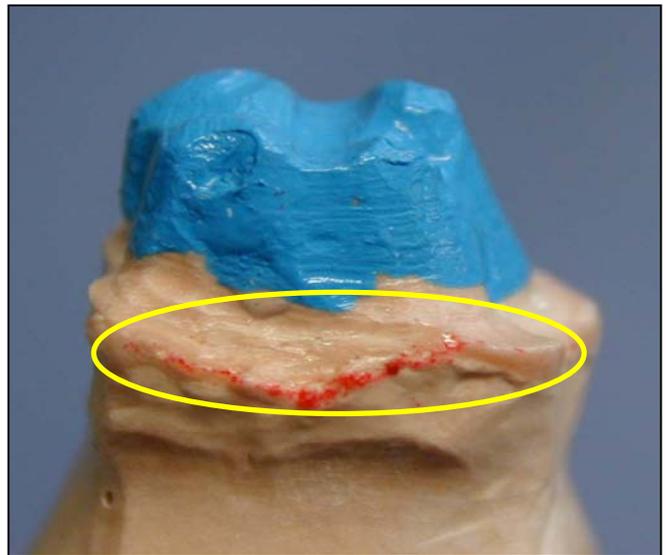


Figure 1. Die submitted for PFM crown: margin was not completely captured in the impression – red pencil line is actually located on soft tissue.

discussion on die trimming is presented here, however, a more in-depth description of the process can be found in the following references:

1. Mansueto, M.A., Phoenix, R.D., A comprehensive approach to die trimming, *J of Prosthodontics*, 3(4): 251-255, 1994.
2. AF Pamphlet 162-6, Volume III, pp. 33-36, 1991.

The practice of excessively ditching dies is contraindicated because it weakens the die, makes the margin very fragile, and contributes to the overcontouring of the restoration during the wax crown fabrication process. Waxing instruments are usually rested against the marginal zone of the die during the refining of the wax margins (Fig. 2). Therefore, if this area is not accessible or smooth, a rough and/or overcontoured margin is incorporated into the restoration. The finished die contour should approximate the root structure of the tooth. The finished die base should be smooth and seat fully to place (see Die Base area in Fig. 3). The figure below shows the contours of a properly trimmed die.

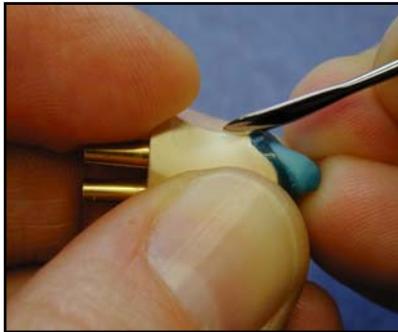


Figure 2. Marginal adaptation of wax – access for instrument.

The finished die contour should approximate the root structure of the tooth. The finished die base should be smooth and seat fully to place (see Die Base area in Fig. 3). The figure below shows the contours of a properly trimmed die.

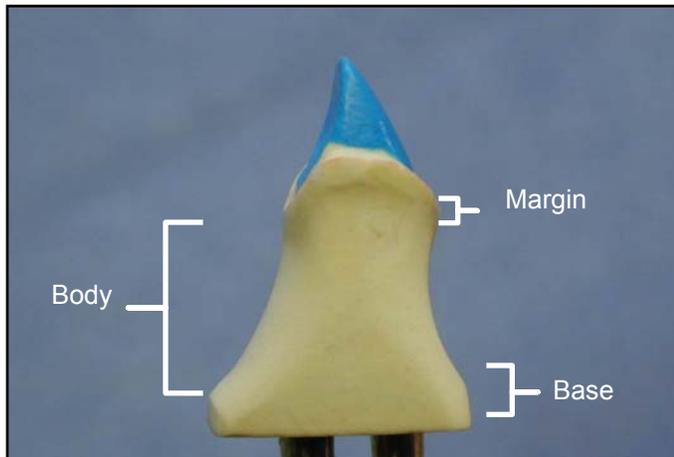


Figure 3. Die divided into three distinct zones: die margin, die body, and die base.

Use a large egg-shaped multifluted bur (Dedeco, carbide bur, 52-C) for gross reduction of excess stone while the stone die is dry to avoid clogging the bur, trimming to within 2 mm of the margin (Die Body in Figure 3). After this is accomplished, soak the die for approximately 15 minutes in a supernatant solution of slurry water prior to trimming with the blade. This allows the die stone to absorb water, which decreases the surface hardness of the stone, and prevents the stone from chipping. The use

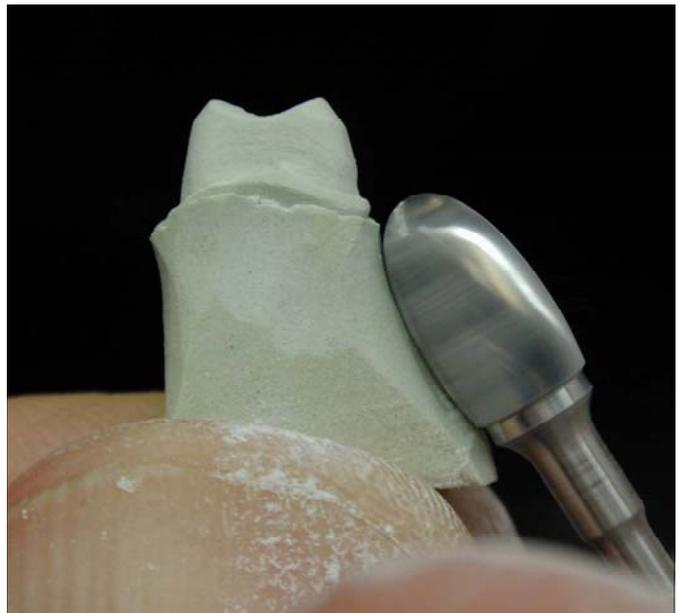


Figure 4. Gross reduction of die.



Figure 5. Left - Instrumentation used for die trimming, from top: die-pushing instrument, pear shaped bur, red pencil, and beaver surgical blade. Right - plastic jar with slurry water solution for soaking dies prior to trimming.



Figure 6. Die trimmed under magnification (3x – 10x provides an excellent view of the marginal areas under good lighting).

of the slurry water prevents the stone from dissolving.

The dentist should accomplish final margin trimming using a sharp knife with good magnification and lighting (Marginal Zone in Figure 3). A small "beaver" blade can be used to trim the marginal zone of the die. Trim the die as follows: establish a finger rest on the die with both hands, hold the cutting instrument with a pen grip, and remove stone in short, controlled strokes. Use a flat-ended blade – this helps control the angle of the cutting surface so you don't gouge into the marginal area of the die.



Figure 7. Beaver blade for trimming marginal zone (Swann-Morton Ltd., SM 64, Sheffield, England).

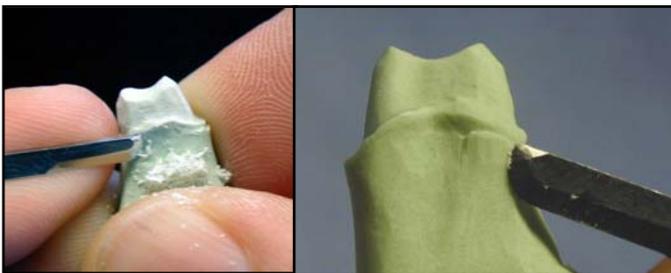


Figure 8. Flat-ended blade used for final die trimming.

After trimming, the die margins should be clearly marked with a single fine red wax pencil line. It is important to mark the margins before applying sealer since the wax marks do not adhere to set die sealer. Inspect the margin after marking and ensure that it is a single, narrow line, which will indicate a sharp and accurate margin. Thick lines or double lines indicate that the margin has not been properly impressed, or that the die is incompletely trimmed. Once the accuracy of the margin has

been verified, apply a die hardener to the entire prepared surface of the die, extending about 2mm below the margin. One coat of cyanoacrylate adhesive on the surface of a trimmed and marked die increases the surface hardness, increases the scratch resistance, adds 1μ thickness, and renders the margin marking more permanent (Ghahremannezhade, et. al JPD, 1983). Best results are obtained when the cyanoacrylate is applied to a die that is not completely dry, and the excess resin is removed immediately with compressed air. Many cyanoacrylates can be quite thick, up to 100μ , and can cause open clinical margins. Therefore, be sure to use a very thin layer of hardener, such as Aron Alpha Industrial Crazy Glue (Elmer's Products, Inc, Columbus Ohio). A piece of rubber dam material may be used to isolate the die when removing excess cyanoacrylate; this prevents the material from getting on your hands (Fig. 10).



Figure 9. Identification of margin with a red wax pencil.



Figure 10. Cyanoacrylate for die hardening: Rubber dam isolates the die to prevent splattering when applying compressed air to remove the excess resin.

After the die hardener has dried, you may apply a die spacing material to the preparation area to provide relief space for the cement. Die spacers provide relief inside the casting so that it will be slightly larger than the prepped tooth. The number of coats will depend on the thickness of the spacer, and the

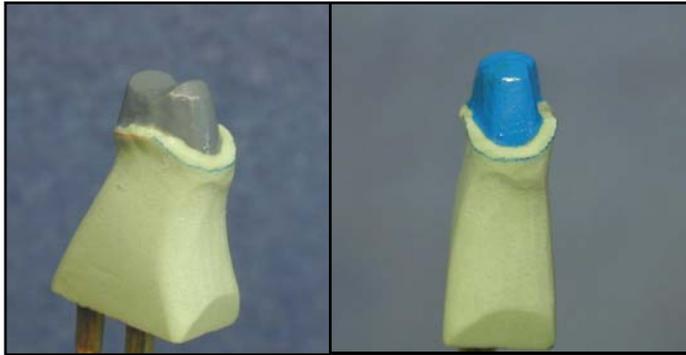


Figure 11. Die spacer applied in successive coats after the margins have been identified and sealed.

technique used, so be sure to read the manufacturer's instructions to ensure that you provide the proper amount of relief. A 20-40 μ layer of spacer is recommended (Campagni, et al., JPD 1982), so the number of coats will vary.

When applying die spacer, keep 1 mm away from the margin; never cover the die margin. If clinical jaw relation records are necessary to mount the casts in an articulator, the casts must be mounted prior to die spacer application. Because die spacer provides relief, the space created will prevent the die from accurately seating in the record causing an increased vertical dimension. When restorations are fabricated at this increased vertical dimension they will be high in occlusion clinically. Die spacers must be applied only to the master die when using multiple transfer dies. This allows the pattern to be transferred from the master die to the working die with minimal difficulty.

Casts and dies must be inspected for accuracy and all nodules must be carefully removed. Verify the adequacy of tooth reduction and ensure that there are no heel interferences before shipping the case. The providers are responsible for the evaluation and approval of their casts and related materials prior to their submission to the laboratory. Please evaluate your work critically!

SLURRY WATER

A simple method to make a die soaking solution is as follows: place die stone pieces (already set) into a 4 oz jar, fill with water, and allow it to set for 48 hours. The resultant supernatant solution may be used for soaking casts or dies. A few drops of Clorox can be added to reduce bacterial growth.

NADL Information

The National Association of Dental Laboratories (NADL) has made some significant changes in the past year concerning qualifications of CDT's and the tracking of continuing education (CE) credits. CDT's must now qualify for renewal every two years, accumulating 24 hours of CE credit during that two-year period. Also, you are no longer required to submit your "pink slip" to the NADL for CE credit; the CE presenter's have been tasked with that responsibility. Just sign-in on the CE Credit Form and the presenter will submit it to the NADL, where they will upload the data into their database. This database is updated monthly, and is posted on their website (<http://www.nadl.org>) for your convenience.

VITA Akzent® Stains

We are currently using the new Vita Akzent® stains. These stains are made of a fine-grained powder, which fire with an intensive color. Color stability and miscibility is superior to the older Vitachrom® L and Delta stains, which makes it easier to reproduce natural color effects and anomalies in the ceramic restoration. If you are still using one of the older generation stains for surface characterization, you may want to consider upgrading to this system. The cost for a complete kit is \$252. A stain shade conversion chart has been included for your convenience (Attachment 1).

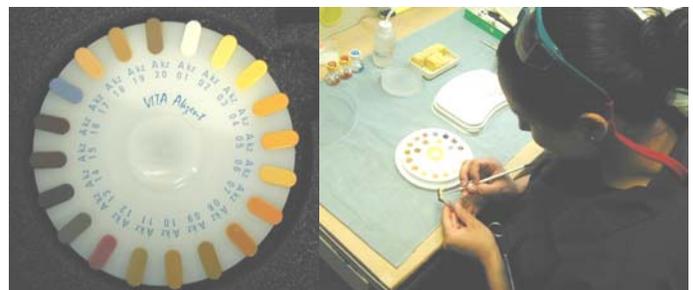


Figure 12. Vita Akzent® stain wheel: twenty stains are available with this system for surface staining porcelain.

Infection Control Standards MSgt Victor Brady

Everyone should be more cautious of sending and receiving items through the mail these days, in light of anthrax spores being spread through the postal service system. If you

are following OSHA's Bloodborne Pathogen Standards in your shipping/receiving areas, then you do not need to make any additional changes to protect yourselves from anthrax. This means that you are using the proper personal protective equipment when opening incoming mail, which includes eyewear (goggles or face shield), gloves, and an impervious gown that covers from the neck to the knees and wrist. Make sure you are using thorough hand washing procedures before and after handling potentially contaminated materials. Sound environmental practice dictates that activities such as eating, drinking, and applying cosmetics do not take place in areas where there is an opportunity for exposure to blood, toxic, or infectious materials.

All cases shipped from/to Air Force facilities must also be disinfected, and wrapped in a disposable plastic bag prior to shipping (IAW USAF Infection Control Guidelines, Chap. 5). When we receive unwrapped cases in the ADL, the contaminated packing material, and sometimes the container, must be disinfected (to eliminate biowaste) and then discarded according to infection control guidelines. Failure to comply with this simple procedure results in a waste of government resources, and may restrict services to your facility.

When recording DLWV credits for these procedures, please note that only 2 disinfections are authorized per case. It doesn't make sense for the disinfections to "cost" more than the prosthesis you made. An inspection last year revealed a USAFE laboratory that routinely took 20-30 disinfection codes (0017) per laboratory case; at \$5 per procedure, this added up to \$150 in disinfection procedures and falsely inflated production values. As a general rule, disinfection procedures should not account for more than 5% of your total DLWV production.

If your facility is in need of additional shipping containers, then you may place an order with the following companies:

Shipping and Receiving items:

Bench paper/Wrapping paper:

8135009662532 Kraft Paper 36" \$95.29 roll

Strapping tape:

7510001594450 Tape, Press Strap 2" \$4.10 ea

Two-slot shipping boxes:

(Note: NSN number found on some boxes is no longer in the supply system)

CREDIT CARD SALES ONLY COMPANY:

Blind Industries and Services of Maryland
2901 Strickland Street
Baltimore MD 21233
Telephone: (410) 233-4567

Order these boxes in quantities of 48 ea (48 boxes are packed in each case)
Last price quote we have is \$1.13 ea; price may be slightly higher today.

Packing foam for two-slot shipping boxes:

Tharco
(Cost \$0.47 per set, 100 sets per case)
2222 Grant Ave
San Lorenzo, CA 94580-1892
Tele: 1-800-772-2332
Fax: 1-800-322-4862
E-Mail: SALES-SLZ@THARCO.COM
P/N: 6520-00-142-8727SET (When ordering, be sure to use the word SET after the part number)

Four-slot shipping boxes and foam inserts:

Tharco
13400 East 39th Ave
P.O. Box 39103
Denver, CO 80239-0103
1-800-525-1831
Part # Z68591 A B C
(A = Lid; B = Box; C = Foam)

OSHA Bulletin

OSHA released a Hazardous Information Bulletin (HIB 02-04-19) on potential health hazards of beryllium exposure in dental laboratories in April 2002. The HIB was released in response to dental laboratory technicians contracting Chronic Beryllium Disease (CBD). This bulletin discusses the risks of developing CBD among dental laboratory technicians and offers information about minimizing such risks, as well as medical surveillance procedures that can be used to identify workers who may be sensitized to beryllium. The bulletin primarily applies to dental laboratories that fabricate beryllium containing dental alloys, however, similar precautions are also suggested in laboratories where there is extensive modification of these alloys. The nine-page bulletin is available on our web site, or may be downloaded from OSHA's website located at <http://www.osha.gov>. Dental alloys used at the ADL that contain beryllium include: Ticonium Premium 100 (.5%

Be) for RPDs, and Rexillium V (1.8% Be) for resin bonded FPDs.

CONGRATULATIONS!!!

The Sembach ADL received the first ever 86th Medical Group Commanders' Annual Quality Award for "Best Flight". This was quite an accomplishment to be the best out of 26 flights – way to go Sembach!

MSgt Larry Borgeson was selected as the USAF SNCO of the Year for 2001!!!

TSgt Robert Henson was selected as the 86th Dental Squadron and Medical Group NCO of the Quarter for the 1st quarter of 2002

LABORATORY MANAGEMENT GUIDE

From time to time, we receive requests about how to manage various dental laboratory administrative processes. This ranges from how to manage the TIM file, establishing a safety or HAZCOM program, to developing a training program. Therefore, personnel at the Sembach ADL have been putting together a management guide for our USAFE customers, which will offer guidance in these various areas of laboratory administration. This will be available in CD-ROM format, and should be ready to ship in June.

ADL TECHNICIANS OF THE MONTH:

Jan: SrA Kyndra Anderson
Feb: SSgt Kevin Murray
Mar: SSgt Tom Hall
Apr: Frau Beate Steinbacher

HAIL:

A1C Kristine Keene – comes to Germany from the schoolhouse at Shepperd AFB, TX.

SSgt Russell Worl – comes to Germany from Wright Patterson AFB, OH.

FAREWELL:

Lt Col William Dinse – will depart mid July to the deserts of Oklahoma – Altus AFB, where he will command the dental flight.

CASE TURN-AROUND TIMES:

FIXED DEPARTMENT: 25 days
FRAMES DEPARTMENT: 17 days
ACRYLIC DEPARTMENT: 5 days

Note: The most current turn-around times are published and updated daily on our website. This represents an average of turn-around times for the previous 7 calendar days.

WE MAY BE CONTACTED AT:

<https://wwwmil.usafe.af.mil/ramstein/86ds/adl>

Randall.Duncan@sembach.af.mil Flight CC

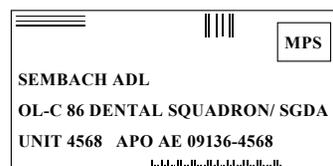
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DSN FAX: 496-6245 COMM FAX: 06302 -67-6245

RANDALL C. DUNCAN, Lt Col, USAF, DC
Sembach ADL Flight Commander

//signed//

WILLIAM E. DINSE, Lt Col, USAF, DC
Sembach ADL Assistant Director

Attachment 1

Shade Conversion Chart: **Vitachrom® L**
Stains with Vita Akzent®

701	Akz 01
702	Akz 02
703	Akz 18
704	Akz 12
705	Akz 17
707	Akz 14
708	Akz 13
709	Akz 03 & 11
710	Akz 03 & 17
711	Akz 06
712	Akz 05
713/717	Akz 19
714	Akz 08
716	Akz 11
718/719	Akz 09
721	Akz 12 & 17

Shade Conversion Chart: **Vitachrom® Delta**
Stains with Vita Akzent®

741	Akz 01
743/751	Akz 06
744	Akz 05
747	Akz 17
749	Akz 09
750	Akz 10
752	Akz 15
753	Akz 20
754	Akz 14

VITA Akzent® stains are compatible with the following porcelains: VITA VMK 95, VITA OMEGA, VITA OMEGA 900, VITA TITANIUM CERAMIC, VITA RESPONSE, VITADUR ALPHA, CELAY, and CEREC.



**SEMBACH AREA DENTAL LABORATORY SERVICES
MARCH 2002**

Fixed Prosthodontic Services

1. Fixed Prosthodontic Services
 - a. **Metal and metal/veneer restorations (post & cores, crowns, survey crowns, FPD's)**
 - i. Metals: Type III and IV Gold
 - ii. Veneer material: Sinfony (ESPE)
 - b. **Metal ceramic restorations**
 - i. Metals: Olympia (Jelenko) Au-Pd alloy, Argedent 52SF (Argen Corp.) Au-Pd alloy, Jelenko-O (Jelenko) Au-Pd-Pt
 - ii. Porcelains: Vita Omega, Vita Omega 900, Vita VMK 95
 - c. **Resin bonded fixed partial dentures**
 - i. Metals: Rexillium V: Ni-Cr-Be (Jeneric/Pentron), Rexillium III: Ni-Cr-Be (Jeneric/Pentron), Wirobond C: Co-Cr (Bego)
 - ii. Porcelains: Vita VMK 68, Vita Omega, Vita Omega 900, VMK 95
 - d. **All ceramic restorations**
 - i. In-Ceram/Sprint - Vitadur Alpha porcelain
 - ii. Veneers - Vita Omega porcelain
 - e. **Attachments**
 - i. Precision: Interlock, small (Attachments International)
 - ii. Semi-precision: various straight and dovetail attachments (Ney)
 - f. **Implants**
 - i. Machined abutments: Gold cylinder multi-unit WP (Nobel Biocare), Mirus cone (Nobel Biocare), CeraOne ceramic caps, and gold caps RP, WP (Nobel Biocare). UCLA gold/plastic abutment, hexed and non-hexed 6 mm (3i), UCLA gold/plastic abutment, hexed and non-hexed 5 mm (3i), UCLA gold/plastic abutment, hexed 4.1 mm (3i), AurAdapt NP, RP, WP gold/plastic abutments (NobelBiocare)
 - ii. Non-machined abutments: UCLA plastic (3i) - components are electric discharge machined, CeraOne plastic caps (NobelBiocare)

Removable Prosthodontic Services

Artificial teeth: Portrait IPN Teeth (Dentsply). All shades correspond to Vita shade guide. Monoplane, 10 degree, 33 degree, 40 degree (limited shades carried for 40 degree)

1. Removable Partial Dentures (custom trays, record bases, tooth arrangements, processing)
 - a. Removable partial denture acrylic resins - all phases
 - i. SR Ivoclar "Plus" (Ivoclar)
 - ii. Characterized Lucitone (Dentsply)
 - iii. Lucitone 199 (Dentsply)
 - iv. Natural COE-LOR: Mild, Ethnic Moderate, Heavy
 - v. Sinfony light-cured tooth shade resin (ESPE)
 - vii. Dentsply acrylic resin repair material
 - viii. Greatlakes orthodontic acrylic resin



- b. Removable partial denture metals
 - i. Vitallium: Cr-Co (Austenal)
 - ii. Ticonium Premium 100 Regular: Ni-Cr-Be (Nobilium)
- c. Attachments
 - i. Swing-Lock labial hinge (Idea Development Co.)
 - ii. Nobil-Latch labial hinge (Nobilium)
 - iii. ERA RV (APM-Sterngold)

Complete Denture Services (custom trays, record bases, tooth arrangements, processing)

- 1. Complete dentures, immediate, transitional, and overdentures - all phases all phases
 - a. IVOCLAR SR Ivocap "Plus"
 - b. Characterized Lucitone
 - c. Lucitone 199
 - d. Natural COE-LOR: Mild, Ethnic Moderate, Heavy

Appliances/Stents/Trays

Orthodontic appliances (Hawley, Hyrax, expansion devices, occlusal devices, etc.)

Expansion attachments: devices for soldering – 7mm, 16mm, and 20mm
devices for acrylic – 14mm

GreatLakes acrylic resin, Ivocap acrylic resin

Palatal expanders: expansion screws, fixed and removable appliances (Unitek)

Athletic mouthguards

Bleaching trays

Custom Stents

Miscellaneous

Articulators: Whip Mix 2240 accumount, 2340 accumount, and 8500;
Hanau Wide-Vue



USAF Sembach Area Dental Laboratory
“Ruck Zuck” Submission Standards
1 March 2002

FIXED PROSTHODONTICS

Must include a properly completed DD Form 2322 (3 copies) and the following:

- Master Cast:**
- master dies and adjacent teeth dual pinned, and sectioned for removal; dies trimmed, marked margins, die hardener and spacer placed.
 - **In-Ceram/ Electroformed Crowns:** do not apply die spacer or hardener to the dies.
 - **RBFPD:** do not pin or section, submit as a solid cast.
 - **Triple Trays:** must be mounted on appropriate articulator, pinned and sectioned according to above specifications.
 - **Porcelain Veneers:** polyvinyl siloxane impression, solid master cast (do not pin dies) based with margins exposed and marked.
 - **Implants:** two casts with implant/abutment analogs: one cast with adjacent teeth pindexed (for seating) and one solid cast for adjusting proximal contacts.
- Solid cast**
in impression: - pour this cast into the impression, ship the solid cast and impression together.
- Opposing Cast:** - accurate, based cast with nodules removed.
- Occlusal**
Registration: - if adequate occlusal contacts exist to hand articulate, then place orientation marks on the master and opposing casts. If there are inadequate contacts, then submit an occlusal registration made with a stable media (wax records are unacceptable).
- Esthetic**
Guidance: - required for all multiple anterior and some posterior cases. Types of guidance might include diagnostic wax-ups, pre-op casts, custom shades, photographs, incisal edge/cuspal position, midline, and custom incisal guide table.

REMOVABLE PARTIAL DENTURES

Must include a properly completed DD Form 2322 (2 copies) and the following:

- Master Cast:** - accurate, based cast trimmed according to AFP 162-6. Do not draw design on master cast. Maxillary casts must have vibrating line and hamular notch marked. Must be poured and based in the same type of stone.
- Diagnostic Cast:** - must be surveyed with tripod marks. RPD design should be drawn on this cast.
- Opposing Cast:** - accurate, based cast with nodules removed.
- Occlusal**
Registration: - if adequate occlusal contacts exist, to hand articulate, then place orientation marks on the master and opposing casts. If there are inadequate contacts, then submit an occlusal registration made with a stable media (wax records unacceptable).
- Esthetic**
Guidance: - If requesting RAPs or Tube Teeth, the teeth and matrix must accompany the case.

COMPLETE DENTURES

Must include a properly completed DD Form 2322 (2 copies) and the following:

- Master Cast:**
- accurate, based cast trimmed according to AFP 162-6. Post-Palatal seal must be placed on cast by submitting dentist. Casts must be indexed and mounted on articulator or ready for mounting using Accumount system.
 - **Immediate Dentures:** - submit periodontal chart AF 935 A (or equivalent) or mark reduction levels on master cast. If requesting surgical templates, please indicate so.
 - **Overdentures:** - mark the teeth to be retained as overdenture abutments and the level of abutment tooth reduction.
- Esthetic**
Guidance: - Tooth shade and mold enclosed, denture base shade; wax occlusion rims should be marked with high lip line, midline, and corners of mouth.

ORTHODONTIC APPLIANCES

Must include a properly completed DD Form 2322 (2 copies) and the following:

- Master Cast:** - accurate based cast with embedded devices (if any), trimmed according to AFP 162-6. Appliance design should be drawn on the master cast or on the DD Form 2322.
- Opposing Cast:** - accurate based cast with nodules removed. Orientation marks placed on cast.

Sembach ADL
OL-C 86 DS/SGDA
Unit 4568
APO AE 09136-456

Sembach ADL Information Letter

Volume 7, Issue 3 USAF Sembach AB, Germany - 10 December 2002

Successful ADL Workshop

A very successful workshop has come and gone; *Vielen Dank* to everyone who participated in this year's event, which excelled in several areas. First, it focused on didactic training for the dental laboratory technician. As the first four-day workshop ever in USAFE, it provided 1,036 hours of continuing education for 52 participants. Second, this year's workshop utilized a web-based registration form, which was an extremely fast and efficient method to track registrations. All workshop courses filled to capacity three weeks after the registration was opened. Unfortunately, we have to limit the number of participants based on the size of the ADL facility. For those of you who were on the waiting list, thanks for your patience, we were able to register a few individuals after some last minute cancellations. Third, the processes used to conduct this year's workshop were almost entirely removed from the ADL technicians. By delegating the instruction of the CE courses to outside sources, the ADL technicians were able to stay at the bench and work your cases right up to the time the workshop began. We are greatly indebted to the following individuals who traveled to Germany to provide us with such outstanding education: Ken Kemple, CDT (Lackland AFB), Arlo King, CDT (DENTSPLY), Marty Lebow, CDT (DENTSPLY), Gary Osborn, MSgt (Dental Investigation Service, Naval Training Center, Great Lakes), and Jeff Smith, CDT (Ivoclar-Vivadent).

All CE was accredited by the National Board for Certification for Dental Laboratories (NADL), so if you attended the workshop as a CDT, check the NBC website (<http://www.nadl.org>) to verify

that you have received credit.

Please complete and return the attached ADL Customer Survey form so we may start planning for next year's workshop. Topics for continuing education courses, and overall ADL services are developed based on your feedback from these surveys.

ADL Workload

The Sembach ADL has experienced a significant decrease in demand for laboratory services over the last 12 months. Cost-effective utilization of ADL assets is the key to keeping these laboratories in operation, especially since ADL manning is determined by DLWV production. If you consider ADLs to be valuable, be sure to make wise use of them.

Advantages of Using the Sembach ADL:

- The ADL is the only full service laboratory in EUCOM/CENTCOM, which can fabricate complex restorations/prostheses (removable partial denture frameworks, all ceramic porcelain restorations, implant supported restorations).
- The ADL can augment your base lab during peak work load times, or minimal manning periods.
- The ADL provides continuing education training through annual workshops, and customized in-house training.
- The ADL can absorb operating costs for the local bases, such as costs for precious metals, prosthetic teeth, specialized attachments for fixed and removable prostheses.

The bottom line is that dental laboratory technicians in your clinic are important members of the dental treatment team. The more efficiently they are utilized in your clinic, the greater your overall production and patient access to care. ADLs are a *force multiplier* for your manpower!

ADL Laboratory Management Guide

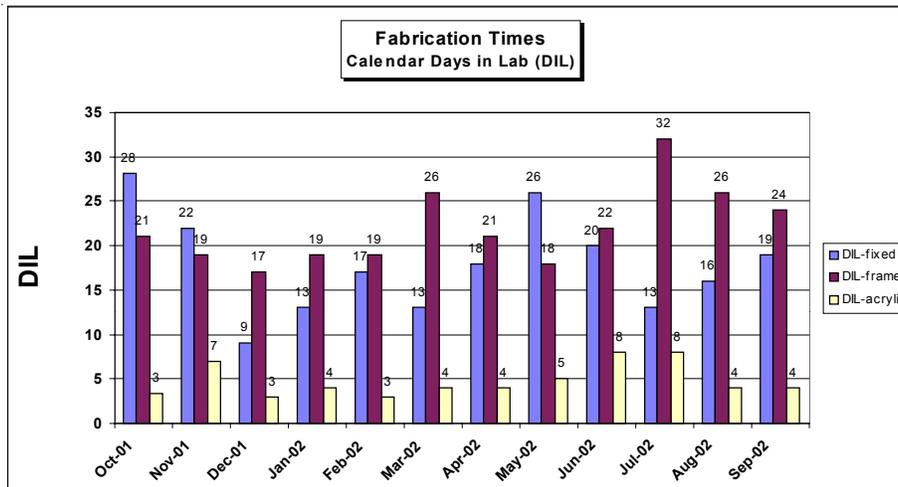
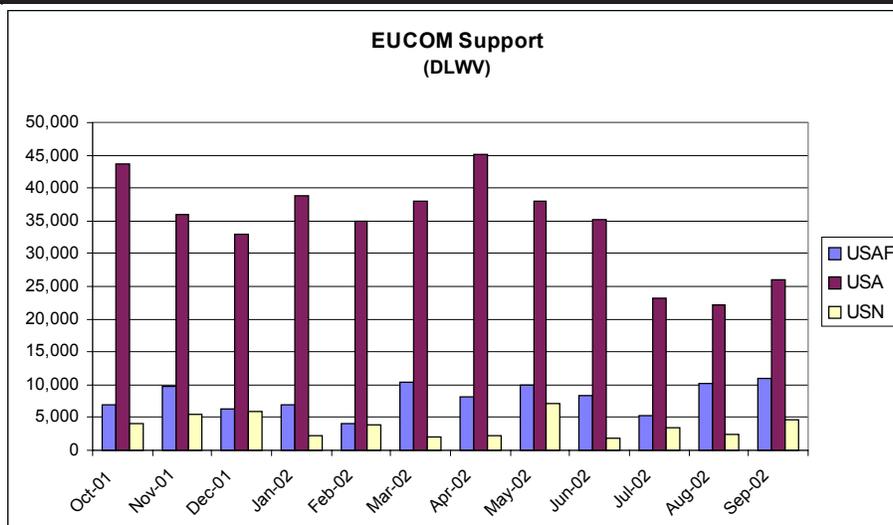
Personnel at the Sembach ADL created an administrative management guide for our USAFE customers, which offers guidance in the various areas of laboratory administration. It was produced and shipped in CD-ROM format to USAFE dental laboratories in July. In order to provide you with a comprehensive source of reference, this guide utilizes AFIs, the AF Dental Management Guide, locally produced letters and forms, and personal experience. This guide is not intended to be all-inclusive; it is intended to be used for general reference in managing the Base



Dental Laboratory. If you have information that would be beneficial to others, please forward it to the ADL and we will include it in the next version.

This guide is in Portable Document Format (*.pdf), therefore, must be opened with Adobe Acrobat Reader 5.x, (available at no charge at <http://www.adobe.com>). You must use this version, or higher, to be able to copy and paste information to a word processing application. Previous versions of Acrobat Reader do not have the "text select tool" function, which allows you to copy and paste. If you did not receive a copy of this guide and would like one, please contact Frau Evans at DSN 496-6530 and she will mail one to you.

Sembach ADL Production Metrics - FY 2002



Certified Dental Technician Continuing Education Requirements

The National Board for Certification for Dental Laboratories (NBC) is currently phasing CDTs into a one-year renewal cycle. Until all CDTs are on a one-year renewal cycle, some CDTs will be required to submit 24 hours of continuing education credits while others will be required to submit 12 hours of continuing education credits. CDTs who became certified or last renewed in the years 2000 or 2001 or in March or June of 2002 must submit 24 credits with their next renewal. CDTs who last renewed in or after September 2002, will be required to submit 12 hours of continuing education credit when they renew (in September 2003 and after). CDTs renewing in September 2002 must submit 24 hours of continuing education credits accumulated in the two years since their last renewal (September 2000 - September 2002).

Two-year renewal requirements (24 credits)

- Twelve hours must be documented scientific credit.
- Eleven hours may be: documented scientific credit, professional development credit, or other non-documented credit.
- One hour of infectious disease control or other OSHA compliance education.

One-year renewal requirements (12 credits)

- Six hours must be documented scientific credit.
- Five hours may be: documented scientific credit, professional development credit, or other non-documented credit.
- One hour of infectious disease control or other OSHA compliance education.

To meet the one-hour infection control CDT requirement, the National Association for Dental Laboratories (NADL) offers an on-line course, *Infection Control in the Dental Laboratory*. This course costs \$85 for NADL members and CDTs, or you can go to the DIS website and take their infection control course at **no cost!** Kudos to Col Charleton and the DIS staff for providing this

service. Several courses are available on the DIS website for laboratory technicians to choose from, all are accredited by the NBC for CDT credit.

"Guessthetics"

Lt Col Randall Duncan

Col. (Ret) Samuel Askinas wrote a timely article in ADL Bulletin #2 back in 1971 concerning the lack of esthetic communication for fixed prosthodontic restorations between the dentist and the dental laboratory. Today, dentists and patients alike, are much more esthetic conscious than they were 30 years ago with many dentists building their entire practices around esthetic concepts. Surprisingly, however, there continues to be a consistent lack of information submitted to the dental laboratory concerning esthetic requirements. The Sembach ADL receives esthetic guidance for only 15% of the anterior fixed restorations received for fabrication. Dr. Askinas's article is even more timely for us today, therefore, some of the key elements will be discussed here.

All restorations in the anterior region of the oral cavity should receive the utmost attention in assessing esthetic details. Guesswork about basic esthetic factors such as arch and tooth form, tooth position, incisal plane, tooth length, horizontal and vertical overlap is bad, even if it is done by the most experienced laboratory technicians. Guesswork is a poor substitute for the clinician's knowledge of what looks esthetic and natural in the patient's mouth.

If the restoration or prosthesis is unilateral, and the contralateral teeth are acceptable guides for contour and position, then no additional guidance is necessary. However, when anterior teeth are being replaced with a fixed partial denture or restored by multiple anterior crowns, the laboratory must have some guidance on midline location, tooth length, and contours, as these basic elements are not easily altered in the completed fixed restoration. Unlike removable partial dentures, which allow for a wax try-in of plastic denture teeth, fixed prosthodontic restorations require that esthetic determinants be finalized prior to framework construction, and sometimes prior to tooth preparation.

Fixed prostheses and restorations, however, can also be tried-in to evaluate these esthetic determinants. When evaluating the esthetic parameters for fixed restorations, simply construct



Fig. 1. Prosthodontic restorations submitted to ADL without esthetic guidance. Diagnostic wax-up completed and ready for duplication.

a diagnostic wax-up on the master cast (Fig. 1), duplicate the wax-up in stone (Fig. 2), then make a clear plastic template. This template is then used



Fig. 2. Duplicated cast of diagnostic wax-up. A vacuum formed template is made over the cast for the construction of provisional restorations, which are tried-in for esthetic evaluation.

to make provisional restorations for a “clinical try-in” (Fig. 3) and evaluation. Not only can you evaluate the esthetic needs for the patient with this procedure, but you can also determine functional parameters as well. Plastic restorations can be easily evaluated and modified over several clinical appointments, if necessary, until you and the patient are satisfied with the esthetic outcome (Fig. 4). When the final esthetic determinants are made, this information is then submitted to the laboratory



Fig. 3. Provisional restorations made from the diagnostic waxed-cast are now ready for clinical try-in. Tooth contours, length, midline, etc. may be evaluated and modified at this time.



Fig. 4. Provisional restorations have been modified during the esthetic try-in. Modifications are captured with an alginate impression/stone cast, then forwarded to the laboratory with the master casts for fabrication.

for incorporation into the final restorations. This is accomplished by duplicating the modified provisional restorations then making a stone cast. The stone “go-by” cast is then forwarded to the laboratory (Fig. 5), where various silicone matrices are made to help establish the proper dimensions of the restorations.



Fig. 5. Duplicated cast of provisional try-in by clinician. Changes are communicated from the clinic to the laboratory through this “go-by” cast for incorporation into final restorations.

When cases arrive at the ADL with missing or inadequate esthetic guidance, our default policy is to only complete a diagnostic wax-up at this stage of the fabrication process. This diagnostic “information” is returned to the submitting dentist in the form of a solid cast and plastic matrix, so that a clinical try-in may be completed. The dentist may then evaluate the esthetics intraorally by constructing provisional restorations as previously described. Keep in mind that the esthetics incorporated into this diagnostic cast is made entirely in the laboratory, without any clinical direction; rarely is it returned to us without any modifications. The goal is to provide you with a “ballpark” position of the proposed restorations, so you can make additive or subtractive changes based on clinical parameters.

Modifications made during the try-in appointment are then captured with an alginate impression/stone cast, which is returned to the laboratory with the master casts for fabrication. After receiving this “go-by” cast, the laboratory fabrication process continues to completion.

The proper sequence of constructing esthetic-based restorations for your patients requires the evaluation of these esthetic parameters *before* and *during* the tooth preparation appointment. The esthetic outcome is driven by the position and preparation of the existing natural teeth. On some occasions, you will be required to re-prepare the teeth in order to achieve the desired esthetic goals...therefore, *Begin with the End in Mind!*

Illuminate Shaded Ceramco 3 Porcelain

DENTSPLY Ceramco has graciously provided us with a limited supply of Ceramco 3 Illuminate™ Bleached Shaded porcelain. The Illuminate shades are very high in value, which may be needed when trying to match porcelain restorations adjacent to bleached natural teeth. There are 8 shades to choose from, all higher in value than Vita B1. Ceramco® 3 is a natural feldspathic porcelain, and may be used for all single and multiple unit porcelain fused-to-metal fixed restorations using conventional high-fusing ceramic alloys. If you are interested in using this system, please contact TSgt Keith Low or Mr. Ron Hill, and we will send you the Illuminate™ shade guide.



Fig. 6. DENTSPLY Ceramco 3 Porcelain Illuminate bleached shade guide.



2002 Sembach ADL Workshop Attendees

Interchangeable Articulators

TSgt Robert Henson and Lt Col Randall Duncan

The Sembach Area Dental Laboratory currently utilizes Whip Mix articulators that employ the Accumount “interchangeable” mounting system, which is utilized on the 2000 and 3000 series articulators. This feature allows casts to be transferred to different articulators while maintaining an accurate three-dimensional occlusal relationship.

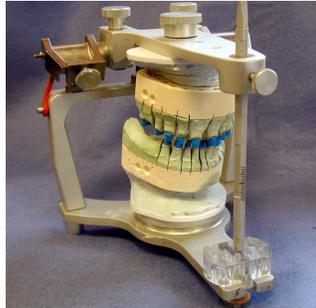


Fig. 7. WhipMix 2240 Accumount articulator with mounted casts.

The basis behind this feature is a consistent relationship of distances between the condylar elements and upper/lower frames of the articulator, which is held to a high tolerance during the manufacturing process. This process involves attaching a one-piece jig to the upper frame of the articulator, which has a mounting plate secured to the lower portion of the jig. The upper frame is closed, until the zeroed incisal pin contacts the incisal table, then the mounting plate is soldered to the lower articulator frame with a low fusing solder. This procedure is then verified by the manufacturer using the #2245 “Check System” and #2247 “Check Ring”, which is available for purchase so that users may verify the accuracy of



Fig. 8. WhipMix #2245 Check System and #2247 Check Ring (left), on a #3140 Accumount articulator.

their articulators. It should be pointed out that the “check system” product is mislabeled and only contains the cylinders that attach to the upper and

lower frames. It does not include the check ring, a necessary component for testing interchangeability, which must be purchased separately. For clarification purposes, this article will refer to the “check system” as both the cylinders and the ring together.

The advantages of articulator interchangeability as outlined by Price and Mansfield (J Prosthod 1999; 8:235-239) include: fewer articulators needed by the laboratory to service the same number of patients; reduced shipping costs and articulator wear when articulators are not mailed; and convenience of mounting casts without the need to match casts to a specific articulator by serial number. When mounting in the clinic or base laboratory, clinicians can verify accuracy and occlusion before submitting cases to the ADL. This also eliminates the need for producing lateral mounting straps, thereby eliminating the need for casts to be mounted twice; one by the base laboratory and then again by the ADL.

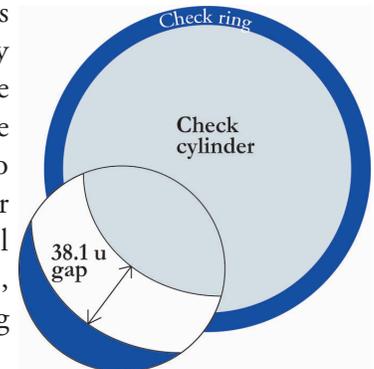


Fig. 9. When the Ring is centered around the Cylinder, there is a 38.1 micron gap.

As with any interchangeable system, certain measures must be taken to ensure its accuracy. One study evaluated the long-term reliability of the Accumount system and found that 76% of them remained accurate for up to seven years (J Prosthod 2000; 9: 142-147). In order for the technician to know if the articulator in use is accurate at any given time, a check system must be used to evaluate system accuracy. Price and Mansfield described this process using the Whip Mix check system to

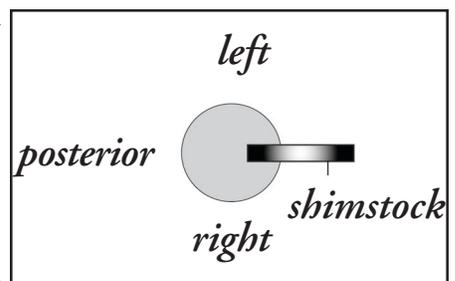


Fig. 10. Shimstock is placed in four positions around the cylinder.

a defined accuracy of 52 microns vertically, and 94 microns horizontally. However, our horizontal measurements indicated only a 76.2 micron gap between the cylinder and ring. Horizontal accuracy is determined by sliding the check ring vertically and horizontally along the two gauge blocks (there is a 38.1 micron gap between the cylinder and the ring when the ring is centered, or 76.2 microns when the ring is laterally positioned on the cylinder). Discrepancies exceeding 76.2 microns will prevent the check ring from sliding. The vertical accuracy is determined with shimstock held between the two gauge blocks at various positions (right, left, anterior, and posterior positions, Fig. 10) around the cylinder. Any space from the four positions that failed to hold 52 microns of shimstock constituted a failure in interchangeability. Articulators calibrated to these tolerances have exceeded the accuracy of 98% of the casts with occlusal registrations submitted to the Sembach ADL, therefore, they are very efficient instruments for streamlining laboratory production.

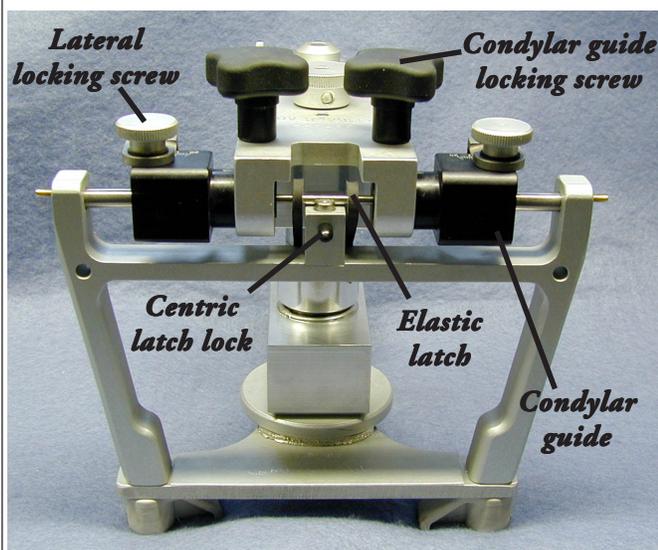


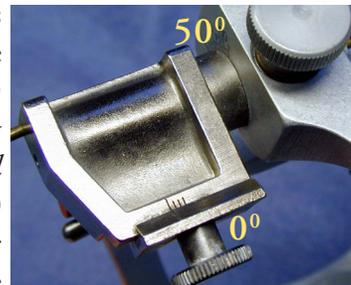
Fig. 11. Whip Mix #3140 Accumount articulator. The centric latch assembly differs slightly between the 2000 and 3000 series of instruments. All locking screws and latches must be secured during the evaluation process.

Before the evaluation process is performed, the articulator must be carefully cleaned and inspected. Ensure that the serial numbers on the upper and lower frames of the articulator match. On 2000 and 3000 series Accumount models, attach the gauge

blocks to the upper and lower frames, remove the incisal guide pin and adjust the articulator as follows prior to evaluating interchangeability.

2000 Series Accumount

On 2000 series articulators, set the *condylar guides* to 50 degrees (the Face Bow mark) and the *lateral side shift guides* to 0 degrees. Then after tightening both the *lateral locking screws* and the *condylar guide locking screws*, engage the *centric latch*.



3000 Series Accumount

On 3000 series articulators, set the *condylar guides* to 30 degrees and the *lateral side shift guides* to 15 degrees. Then after tightening both the *lateral locking screws* and the *condylar guide locking screws*, engage the *centric latch*.



Fig. 12. After locking down the articulator, the check ring will slide over both cylinders if they are properly aligned. These photographs demonstrate an instrument that tests positive for interchangeability.

Both 2000 and 3000 series articulators can now be evaluated with the check system by opening the articulators and positioning the slide ring over the lower cylinder, then closing the upper frame until the cylinders contact. Manipulate the slide ring up

and down the cylinders to check for accuracy: if the ring does not move over the two cylinders freely, then the articulator fails the horizontal check. Next, raise the upper frame and place the appropriate thickness (Almore = 8 microns; Artus = 12 microns) of shimstock strips at the previously mentioned positions (Fig 10). If any of the four predetermined locations fail to hold 52 microns of shimstock, the articulator fails the vertical check.

Although these articulators are factory-calibrated, they should be verified for accuracy with the check system upon purchase, and then evaluated annually thereafter. Instruments that are dropped or mishandled should, of course, be checked immediately before being used in the laboratory. These are precision instruments and can not withstand the rough handling that other non-precision articulators receive, therefore, handle them with care!

The check system is only designed to *verify* the accuracy of the Accumount mounting plate. If the articulator fails any portion of the test, contact Whip Mix Corporation for information on how to get your instrument re-calibrated. Technicians can make minor adjustments to the instrument, but only with appropriate instructions from the manufacturer. If articulators are less than 1 year old, they can be returned to Whip-Mix for re-calibration at no charge. Further information can be obtained by contacting a technical representative at 1-800-626-5651. Further information or manuals on the 2000 or 3000 series articulators can be obtained by contacting the manufacturer. We would like to acknowledge the help of Mr. James Robinson at the Whip Mix Corporation. He has been extremely helpful in guiding us through the technical portion of this article, and is the true expert with the Accumount system. He may be contacted for further information at jrobinson@whipmix.com.

CONGRATULATIONS!

Kudos to SSgt William Divine of the ADLs porcelain section - he designed the facing of the first ever *USAFE Command* coin. The coin is



currently being minted, and will soon be available for purchase.

Congratulations to TSgt Shauna Brucker as a dual degree graduate from the Community College of the Air Force. She was also recognized as one of five outstanding recipients to receive the Pitzenbarger Scholarship.

ADL TECHNICIANS OF THE MONTH:

May: TSgt Brett Bragdon
 Jun: TSgt Shauna Brucker
 Jul: SSgt Kevin Keene
 Aug: TSgt Keith Low
 Sep: SSgt Kevin Murray
 Oct: TSgt Keith Low

FAREWELL:

MSgt Larry Borgeson— departed in July rather unexpectedly to Lakenheath AB, due to a humanitarian PCS. We have missed your enthusiastic attitude and dedicated leadership, which you provided so well to the entire ADL. Best wishes to you and your family from everyone at Sembach.

CONTACT US AT:

New web address and redesigned website!

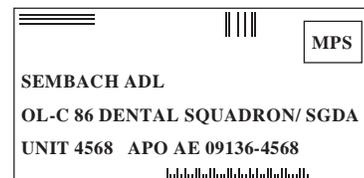
<https://wwwmil.ramstein.af.mil/86med/86ds/adl>

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Victor.Brady@sembach.af.mil NCOIC

Robert.Henson@sembach.af.mil Fixed Element

Brett.Bragdon@sembach.af.mil Removable Element



DSN: 496-6530 / 7733 COMM: 06302-67-6530 / 7733

DSN FAX: 496-6245 COMM FAX: 06302 -67-6245

// signed //

RANDALL C. DUNCAN, Lt Col, USAF, DC
Sembach Area Dental Laboratory Flight Commander

Sembach Area Dental Laboratory Customer Survey

How may we support you?

The Sembach ADL would appreciate you taking a few moments to support efforts in providing you quality dental laboratory products and services. Your feedback, along with any comments and suggestions, will help improve our service to you. Please return this completed survey by mail or FAX by 15 January 2003.

By Mail: 86th Dental Squadron/SGDA
Unit 4568
APO AE 09136-4568

By Fax: DSN: 496-6245
Commercial: 06302-676245 (within Germany)
0049-6302-676245 (outside of Germany)

1. Personnel: Name of Laboratory Officer - _____
Name of Laboratory NCOIC - _____
Number of Laboratory Technicians:
Military – _____
Civilian - _____

2. What additional dental laboratory services or products would you like to see provided by the ADL?

3. Do you receive copies of the Sembach ADL Information Letter? Yes No
If yes, how well does the ADL Information Letter meet your needs for laboratory information and updates?

Poor		Acceptable		Excellent	N/A
1	2	3	4	5	6

4. What specific areas would you like to see addressed by the ADL Information Letter?

More technical information

More administrative information

Other areas of interest: _____

5. Date of last ADL Consultant visit? _____

6. What specific training would you like to see at the next Sembach ADL workshop (October 2003)?

7. Other suggestions or comments:

ADLibs

Peterson Area Dental Laboratory Information Letter

22 April 1995



Great Workshop!

The Peterson ADL has recently completed its 1995 Combined Workshop, and judging by the critiques and participant comments, it was a resounding success. The event was located at the Red Lion Hotel which provided superb accommodations for many of the record number of attendees (over 360). This was more convenient than the normal base billeting arrangements in that participants could go from their rooms to the meetings without requiring transportation. In conjunction with the workshop, there were also a number of social functions that went extremely well. As usual, they helped rekindle camaraderie among old friends.

The Workshop was the culmination of many months of diligent planning. The entire ADL staff worked extremely hard and did a marvelous job in putting it together. They deserve our heartfelt congratulations. In addition, we would like to thank all the speakers, table clinicians, exhibitors, and presenters of the outstanding hands-on courses. Next year's workshop will be hosted by

the Barksdale ADL. The dates have not yet been set. Although this year's event will be tough to top, I'm sure the Barksdale staff will give it their best shot. Let's give it our continued support and make next year's workshop the best ever.

Peterson ADL Wins USAF Facility Design Award!

The Peterson ADL took top honors in the Military Facility category of the USAF Facility Design Awards. Your new laboratory was cited for superior architectural design and functionality. It came as no surprise that the wonderful view of the Rocky Mountains added to the high marks the ADL received for creating a pleasant working environment.

This is a very special honor since much credit for the internal design can be given to our own laboratory technicians. While developing the equipment layout and floor plan, the technicians (previously stationed at the Lowry ADL) in each section (i.e. casting, metal finishing, etc.) were tasked with creating a work area ideally suited to their needs. These individual plans were carefully refined and given to the design architect. He then combined them into one floor plan which consisted of a large central work area surrounded by logically placed peripherals. Case flow was therefore designed to flow smoothly through all the steps of fabrication from check-in to check-out.

Winning this honor reflects not only the hard work and planning that went into the Peterson ADL, but also the level of talent we have in our dental laboratory technicians. Subsequently, one of our technicians will represent the ADL at the Facility

Design awards ceremony in Omaha, Nebraska on 19 May 95.

Farewell to Maj Wasson

Our Fellow in Dental Laboratory Management, Maj Douglas J. Wasson, will soon be leaving the Peterson ADL for reassignment. During the past year Doug has not only mastered dental laboratory management, but has been an invaluable member of our team here at the Peterson ADL. He has gone above and beyond the call of duty in contributing to the quality of the ADL operation through projects such as the rewrite of the ADL Submission Standards and Clinical Procedural Guide, which are both impressive documents (included in this mailing). He was also in charge of putting the ADL Workshop together. Believe me, that was a monumental task well done. We at the ADL will sorely miss Doug, but probably those who'll miss him most are the people who have worked with him on case submissions. They know how helpful Doug can be. We want to wish Maj Wasson the best of luck and great pleasure in his next assignment!

IPS EMPRESS ON LINE

The Peterson ADL now has the capability to do IPS Empress all ceramic crowns. IPS Empress is one of the newest non-metallic ceramic restoration materials available. It is a highly esthetic leucite-reinforced glass ceramic material used for full crowns, inlays, and veneers. It is designed to be used on single units where stress is low and esthetic requirements are high. Marginal integrity of Empress crowns is good as a result of pressing molten ceramic into a lost wax investment mold. Strength and wear characteristics are also reported to be favorable. Tooth preparation, shade selection, and die requirements are essentially the same as those of Dicor. Please call us if you wish to submit a case

and have any questions. More detailed technical information will appear in a subsequent information letter.

Procedural Guide/ Submission Standards

We are mailing our newly revised Submission Standards and Clinical Procedure Guide along with our information letter. These are outstanding references (thanks to Maj Wasson) for your use in dealing with the ADL or for managing treatment of prosthodontic patients. They are also great training aids for residents, prosthodontic rotators, or inexperienced laboratory technicians. If your facility needs extra copies, let us know how many, and we will mail them to you.

Send Us Your Work!

Due to our recent ADL workshop, we were thrown temporarily behind the power curve in completing and shipping cases. Now our fine tuned machine is humming along again, and we're ready to take on anything you send us. If your base laboratory is getting backed up or you need help with a particular problem, send it to us, and we'll be more than happy to help.

JAMES G. MCCARTNEY, Col, USAF, DC
Assistant Director, Peterson Area Dental
Laboratory

ADLibs

Peterson Area Dental Laboratory Information Letter

15 December 1995



Casting Machine Update

And now for the latest hot information we have on the covered casting machine requirement-?????. Unfortunately we don't have much to share. It has been very difficult to get anything from the casting machine manufacturers. For example, Degussa promised the Peterson ADL a users test of their Motorcast Unit, but failed to deliver. They also have not returned our repeated phone calls. Thus far, the Ticonium Company has been most helpful. They have placed covers on our two Ticomatic Casting Machines and have loaned us a "Rotojet" covered tabletop torch casting machine on a trial basis. With this unit you lift the lid, melt the alloy with a torch, quickly remove the torch, and close the lid (being careful not to seriously burn anyone around you--no joke). When the lid is closed, an electric motor powers the casting arm, slinging the metal into the mold. The unit is compact at 14 " high, 19" wide, and 20" deep. It can be mounted on a bench top or on a stand that comes with the unit. The cost is reasonable at \$1800 for the casting machine and \$295 for the stand. There is only one problem that I need to mention. We have yet to get a good casting with it. Either our casting is "cold" with rounded margins from pulling the torch away before closing the lid, or we get porosity from overheating the metal. In all fairness, we have only done a few castings and may yet work out

the bugs in the process. But as we suspected, using a cover complicates the procedure (unless you buy an expensive induction casting machine).

There may be another alternative to relying on casting machine manufacturers. We have a large number of talented, innovative laboratory technicians who are good at solving problems. Let's have a contest and see if anyone can figure out a way to modify our existing casting machines to meet OSHA requirements **AND** produce successful castings. I have heard ideas kicked around such as using a transparent cover so you can melt the metal and cast without shutting the lid and removing the torch. Maybe you could get with someone at your local machine shop to make something easy, cheap, and innovative. If you come up with an earth shattering idea, you may win our Grand Prize of getting your name mentioned in our next Peterson ADL Information Letter. Seriously, I think we have the ability to solve this problem and save the US Government money in the process. If you get a good, workable idea, please let us know.

Revision of AFP 162-6 Vol I, II, and III

AFP 162-6, DENTAL LABORATORY TECHNOLOGY, Vols. I, II, and III is no longer obtainable through publications and will therefore need to be revised in order to remain available as a reference. Lt Col Douglas Wasson at the 381 TRS/DTL, Sheppard AFB Texas is the OPR for this formidable task. Because of resource constraints, personnel at the 381 TS will not be able to tackle this project alone and will require the assistance of capable individuals throughout the dental career fields. If you have an interest in participating in this project by revising a particular section of the pamphlet,

please contact Lt Col Wasson at DSN 736-6967 or e-mail [dwasson@win.atn.af.mil]. This is a huge task, and any assistance you provide will be greatly appreciated.

Completion of 2322s

The DD Form 2322, Dental Laboratory Work Authorization, is an excellent means of communication with the dental laboratory. When properly completed it provides a wealth of administrative data such as the patient's name, organization, and social security number. This is frequently used to contact the patient, locate the dental record, or identify the case. It also conveys prosthesis design instructions specified by the clinician. It not only prevents mix up, but gives the technician a guide for restoration design. In addition to the lack of clinical guidance, basic information, such as a telephone number, is often omitted. Providing us with your DSN number makes it much easier to call if we have a question.

There is now an incentive for properly completing these forms -- The Health Services Inspection (HSI) Teams are looking at them. "Documentation of Laboratory Services" is an element on the HSI checklist. Thus, a quality review of the data gathered and a check for timeliness will likely be done during an inspection. We therefore recommend filling out the DD Form 2322 thoroughly, using the example in AFI 47-101 as a guide. In addition, the HSI has looked for the laboratory officer's signature in Section 8 of the form as a final quality check. The bottom line is that the DD Form 2322 is a very useful document. Filling it out properly will get you a better restoration and help you look good during an inspection.

Gold Register

During satellite visits to the various Air Force dental laboratories, ADL Officers are frequently asked questions about storage and maintenance of precious metals and alloys. Regulatory guidance on this topic is very limited in AFI 47-101 and in the new AFI 31-209 (The Air Force Resource Protection Program). Although guidance isn't extensive, I strongly recommend that you maintain your register in a meticulous, well organized manner. After all, you don't want problems during your monthly inspection (This is required as per AFI 23-101, CH 14, Paragraph 2.2.1). An excellent reference (Though unofficial) is the June 1995 Peterson ADL Dental Laboratory Management Guide. I think it is comprehensive, consistent with regulations, and will answer the majority of your questions pertaining to precious metals management. There are, however, issues that we recommend you address locally. One of these is the level of security measures your lab needs. Much of this will be determined by your Installation Resources Protection Manager from the Security Police Squadron. He will interpret requirements in AFI 31-209 along with any applicable local supplements or governing directives. The dollar value of metals you maintain will have a great influence on this interpretation. At the Peterson ADL, we are authorized to store more than \$7,500 in our safe. Because of this, it must be a "General Service Administration Approved Security Container" that is secured to the floor. However, it is the opinion of the Peterson AFB Resources Protection Manager that less than \$7,500 only requires a locking cabinet or drawer. Don't throw your safes away after reading this, but realize that there is latitude as far as local security measures depending on your particular situation and local expert guidance. I have been to base dental labs that maintain far less than \$1,000 in precious metals (less than the cost of a microscope or electric handpiece). Therefore, it makes sense that their security measures are less stringent than those of an ADL.

Wrought Wire Design for Extension Base Removable Partial Dentures

Extension base removable partial dentures present a unique treatment challenge. Because the masticatory load is shared between teeth and soft tissue of the denture base area, many factors come into play which are non-existent or of insignificant importance in an all tooth borne prosthesis. One of the concerns is the retentive clasping method used. Many types of clasps have been advocated for this situation, each having their advantages and disadvantages. It is important to view each as a system, with the retentive clasp, reciprocation, rest, major and minor connectors, and denture base working in concert to control the forces applied through the denture to the edentulous ridge. Each clinical situation must be analyzed and a system selected that best matches that clinical situation. Because of the location of retentive undercut on the primary abutment, existence of soft tissue undercut, either on the buccal or lingual of the abutment, height of the floor of the mouth, and location of positive vertical occlusal stops, treatment choices may be limited. Wrought wire retentive clasps may be the treatment of choice.

When a wrought wire clasp is used in conjunction with a cast reciprocal clasp and a rest, the clasp assembly is known as a combination clasp. Because the clasp is round, it can flex in multiple planes, as opposed to a cast half-round clasp, which can flex only one plane. If a cast half-round clasp required readapting to the tooth, it can only be adjusted in the buccal-lingual plane without risk of fracture. The wrought wire clasp may be adjusted in multiple planes. In fact, some dentists request the clasps not be adapted to the tooth. This allows laboratory and clinical fitting of the framework, after which, the dentist adapts the clasp to the tooth at chairside. Care must be taken when adjusting any clasp, but particularly wrought clasps, to avoid nicking or denting the clasp

during adjustment. The narrowed dimension at the area of the dent will cause stress concentration and could contribute to early fracture.

In addition to the flexibility, the crystalline structure of a wrought wire differs from a cast clasp. When metal is cast, crystals form as the metal cools. This crystalline form can cause the metal to be brittle, particularly when flexed repeatedly. In manufacturing wire, the metal is pulled through successively smaller openings until the wire is the correct size. This drawing process stretches and narrows the crystals, making the metal more flexible and less prone to fracture.

A commonly used technique in the laboratory has been to embed a wrought wire clasp into the waxed partial denture framework, then burn out and cast the framework to the wire clasp. This method subjects the wire to temperatures high enough to form a generous oxide layer on the wire and also to change the crystalline structure from a wrought configuration to a cast configuration. The oxide layer can interfere with the ability of the clasp to stay embedded in the framework, and allow the clasp to work loose. The altered crystalline structure reduces flexibility, increases brittleness, and makes the wire act similar to a cast clasp of the same size and configuration. There is no clinical advantage of a cast-to wrought wire clasp over a cast round clasp, cast from a wax round pattern. The exception to this is when a PGP (Platinum-Gold-Palladium) wire is used. PGP wire does not oxidize to the extent that base metal wrought wire does. To prevent these adverse effects on the wire, the wire can be adapted to the abutment, a "tail" placed which extends 10mm or more away from the abutment and lays in a trench created in the waxed framework. The wire is removed until after the framework is cast and finished, at which point the wire is replaced and soldered well away from the terminus of the

clasp. Because the clasp is round, the clasp contacts the tooth only along a narrow line corresponding to the height of contour along the length of the wire. This minimal contact allows smoother insertion and removal, minimizes wear on the tooth, decreases surface area for potential plaque retention against the tooth for those patients with less than optimal hygiene, and in some situations can allow tooth contact with the clasp where the survey line is high, and a half round cast would create a space gingival to the survey line, leading to food and plaque accumulation. However, this principle should not be used to avoid proper tooth recontouring.

Generally, 19 or 18 gauge wire is selected for use. The longer the clasp, the heavier gauge wire selected. Seventeen gauge wire is too stiff for most dental applications, and 20 gauge is too light to maintain adaptation or to adequately resist displacement of the partial denture.

All partial dentures move under function. In the case of a distal extension partial denture, the movement is accentuated. Many clasping systems recognize this movement and are designed to allow for it by placing the rest away from the extension base and moving the retentive area toward the denture base to prevent the clasp from engaging the tooth during rotation of the partial as the denture base is pressed into the edentulous ridge. Undercut located on the mid-facial surface in the gingival one-third of the tooth takes advantage of this principle, just as the use of an I-bar or an RPI clasp system does. With a wrought wire, the body of the clasp should engage the midfacial undercut with the terminal one-third rising occlusally out of the undercut. The tip should not be allowed to engage undercut along the line angle opposite the extension base, as this causes torsional forces on the abutment and increases stress to the clasp, either of which could cause failure of the respective elements.

Care must be taken to ensure the wire is adapted to the tooth along its entire length. One problem area is at the shoulder of the clasp. Frequently, the survey line is high occlusally at the line angle. Failure to recontour the tooth at the line angle to lower the survey line can create a situation in which it is extremely difficult to intimately adapt a clasp. The result will be that there will be space between the clasp and the tooth, allowing, as already mentioned, food and plaque accumulation and also reducing the stability of the abutment tooth, by allowing movement in this direction.

One disadvantage of the wrought wire clasp is that over time, it may lose its adaptation to the tooth, decreasing the retention. If this happens, avoid the temptation to automatically readapt the clasp. Examine the partial denture to ensure there are no forces acting to dislodge the denture, such as lack of stability, overextensions of the denture base, inadequacies of fit, or occlusal disharmonies. It has been said that this tendency of wrought wires is an advantage, in that they can act as “training wheels” for the partial denture patient. As the partial loosens, the patient learns to control the partial with the tongue and buccinator muscles, overcoming the need for retention. Without excessive retention, stress is reduced on the abutments improving their long term outlook.

Wrought wire, when used as a combination clasp system to support an extension base removable partial denture has its own set of advantages and disadvantages. Like any, the selection of partial denture component, its choice should be based on the particular clinical presentation and requirements. The combination clasp has been a valuable tool in many dentists’ armamentarium.

Infection Control

We have been experiencing an increasing number of cases arriving that are not wrapped in

plastic before being placed in the shipping boxes. Infection control protocols require that when a cast or material that has been a patient's mouth is placed directly in a shipping box without being wrapped in a plastic bag, the foam insert is then considered contaminated and must be discarded. Plastic bags, such as headrest covers, are much cheaper than foam inserts. Please wrap your casts before packaging them.

Days In Lab

Occasionally someone asks how we calculate days-in-lab. Some facilities measure duty days when considering days-in-lab. This measure has merit for determining certain aspects of efficiency. However, at the ADL, the days are calculated from the day a case is received until the day it is checked out. Weekends, holidays, exercise days, and other "down" days are counted in the total count because these are days the patient is waiting for the restoration. You will notice over time that days-in-lab may increase at certain times. For example, November has two holidays. In addition, we had the AF-wide medical stand down day, a wing family day, and a 3-day exercise, giving us only about 14 effective work days for the month. The result has been increased turnaround times for November. By becoming familiar with events that impact on days-in-lab, you can predict to some degree how long it may take to get work back.

RAPs

RAPs, or Reinforced Acrylic Pontics, provide a valuable method for anterior tooth replacement. However, improper RAP preparation prior to framework fabrication can negate any benefits of the technique. Be sure to carefully adapt the

denture tooth to the ridge. The more denture tooth structure that can be preserved, the stronger the final restoration will be. Removing large amounts of resin from the denture tooth and creating a large space between the tooth and the edentulous ridge requires excessive amounts of autopolymerizing resin be used to retain the tooth to the frame, weakening the restoration. The matrix used to relate the teeth to the cast must be made to fit the master cast, should engage one half to one tooth on either side of the edentulous space and should leave the lingual, apical two thirds of the denture exposed to allow the opposing teeth access for development of occlusion. Leave the facial necks of the denture teeth exposed. Adjust the linguals of the denture teeth for the occlusion, protrusive as well as centric occlusion.

Solid Cast and Accuracy

Peterson ADL is trying to improve its service to you and is making changes toward that end. Before delineating these, I want to explain my prosthodontic philosophy as it relates to the dental laboratory. I think there are three major, definable areas of fixed prosthodontic prostheses that often require adjustment, cost chair-time and cause headaches. These are seating discrepancies between the cast and the mouth, inaccurate interproximal contacts, and inaccurate occlusion. (Emergence profile and contours could be included here, but since their evaluation is more subjective than the other three, I've chosen to deal with this elsewhere.) Problems in these three areas can be due to either clinical errors, or laboratory errors, and it is often very difficult to discern between the two. It is likely however, that many seating problems are caused in the laboratory, and that many problems with occlusion are due to inaccurate or lost provisionals, or wear of provisional acrylic resin restorations for long periods of time.

We at the ADL have control over laboratory procedures. In the past, we have duplicated master dies in a highly successful attempt to eliminate discrepancies between prosthesis fit on the cast and in the mouth. Duplicate dies were used to do gross fitting of the prosthesis, with the master die saved for final adjustment. We are no longer doing this. Duplicating dies is labor intensive and can add an extra 2 days to fabrication time. Excessive turnaround time is one of the biggest dissatisfactions the ADL has to deal with. Instead, we want a solid cast included in addition to the pinned cast. This is a minimum. Fitting dies are also helpful, and it can be prudent to send the impression.

Use of a solid cast has several advantages over use of duplicate master dies.

1. A solid cast gives much more reliable information about the interproximal contacts than a pinned cast. Thus, with a solid cast and pinned cast, we can reliably cover two of the three factors named earlier.
2. A solid cast is used to verify the relationship of abutments in FPD cases. This is one of its most valuable uses. Therefore, be sure to send solid casts with all FPDs.
3. An untrimmed solid cast gives the technician information about the tissue. Occasionally we will change emergence profiles based on what we see on the solid cast. If you are concerned about our ability to correctly trim to the margins on a solid cast, you may do the trimming. Keep in mind that we do not normally alter the prosthesis's margins based on what we see on the solid cast.
4. Occasionally, master dies, as we receive them, are not an accurate reproduction of the impression. There are several reasons for this, including chalky areas, sharp areas not reproduced well, and rough handling by the base laboratory. Use of a solid cast (or separate fitting dies) allows us to correct many of these errors.

In the absence of seating dies, we will use the solid cast as a duplicate seating die. In this case we are trying to assure the technician will not inadvertently alter the master die during seating procedures. We may also use a solid cast (or fitting dies) to correct porcelain margins if the master die appears unreliable.

From my experience, correct use of a solid cast will eliminate interproximal adjustment on most of your cases, and allow seating in the mouth, identical to that on the cast in almost every case. You may see a new quality assurance form that attempts to quantify specific areas of prosthesis adjustment. **PLEASE GIVE US PROMPT FEEDBACK ON WHAT WE ARE DOING. OUR GOAL IS TO BE AS RESPONSIVE TO YOUR NEEDS AS POSSIBLE.**

If you do not send us solid casts, fitting dies, or the impression, you may notice that you need more time to properly seat your prosthesis. This is because all adjustments would have been done on the master die, whereas in the past, gross adjustments were done on the duplicate die, and fine adjustments were done on the master die. Again, please send us solid casts for the additional information we can glean from them.

On especially large or complex cases, please send us the impression, or as a minimum, two solid casts. I would define these cases as those with more than six units, attachment cases, stress broken FPDs, or any case you feel is more complicated for whatever reason.

We are also mindful that occlusion problems are also a constant complaint. We are trying to address this. More in the next newsletter.

Closure of ADLs

With the drawdown of the US Armed Forces, it was inevitable that workload at our ADLs declined. We are nearing the point where it is no

longer economically practical to maintain all of the ADLs we have. Consolidation will be necessary and is desirable. While discussions regarding this subject are ongoing at higher levels, dentists and laboratory technicians in the field are not without an influence.

The decisions regarding which ADLs will continue will be made, in part, on the workload of the respective laboratories. The Air Force manning standard automatically increases or decreases the manpower available based on the CLVs produced by that ADL. Those labs that are less busy will naturally get smaller. If you consider ADLs to be valuable, be sure to make wise use of them.

Consider, for example, that ADLs can increase your productivity locally. If an ADL can fabricate restorations and return them within 20 days, including mail time, but your local workload requires 30 days, doesn't it make sense to send some of the work to the ADL? This improves both local capability and preserves the ADLs for when they may really be needed. Have you considered making temporary restorations in the base lab rather than making them chairside, freeing the dentist to see additional patients? Diagnostic wax-ups, RPD esthetic try-in prior to framework fabrication, preparation guides, and custom shade tabs for both fixed and removable restorations are just a few ways dental lab technicians can enhance their position on the treatment team. If the added work creates a backlog in the local lab, send more work to the ADLs. ADLs are a multiplier of your manpower.

The ADLs can absorb costs for the local bases. With costs constantly increasing, and particularly considering the high cost of precious metals, use of the ADL can be a valuable partner in fiscal management. Projections are that FY97 will mark a new era of limited budgets, far more stringent than anything we have seen in the past. Will there be ADLs in the future to assist you in

your resource management struggles? Are ADLs an anachronism or the way of the future? How you manage your work may determine the answer.

Of course, I would like the surviving ADL to be Peterson ADL first, and Air Force ADLs in general. But according to DoD Directive 6015.22, you may ship to any of the DOD's eight ADLs. You now have a say in which of the eight ADLs continue and which are consolidated. I would hope you would support the ADL you feel has provided you the best service. If you haven't tried them all, I invite you to do so. The addresses are below. Good shopping.

Barksdale ADL
2 Dental Squadron/SGDA
334 Davis Ave West Ste 100
Barksdale AFB LA 71110-2077

Ft Gordon ADL
USAADL-Ft Gordon
Ft Gordon GA 30905-5661

Kadena ADL
18 MG/SGDA
Unit 5270
APO AP 96368-5270 (Kadena)

Norfolk ADL
Naval Dental Center
1647 Tausig Blvd
Norfolk VA 23511-2896
Peterson ADL
21 DS/SGDA
1045 E. Stewart Ave
Bldg 2012
Peterson AFB CO 80914-9045

Ft Sam Houston ADL
Bldg 2059
Ft. Sam Houston TX 78234-6200

San Diego ADL

Naval Dental Center
 PO Box 368147
 2310 Craven St.
 San Diego CA 92136-5596

Wiesbaden ADL
 OL-B 86 Medical Group/SGDL
 Unit 4568
 APO AE 09220-4568 (Wiesbaden)

Dental Craftsman/Dental Laboratory Craftsman
 Course

This past summer, I had the opportunity to attend the initial 7 level course at Sheppard, and it was a very rewarding experience. Kudos to TSgts Leo Chaney and DeeAnn Mejia for their tremendous effort in putting this course together. I am confident that all of you who will be attending will find it quite insightful. Please be advised that all the information presented in this course is now core requirements for upgrade to the 7 skill level, so it would behoove you to come prepared. Training references for all subjects are included in the CFETP.

Speaking of the CFETP (Career Field Education and Training Plan for those of you who have been in hibernation for the past year or so), I hope everyone has incorporated it into your training. It was released to the field in April, so if you're not using it, you're really behind the times! Because of the numerous minimum core task requirements of this document, it forces us to take a much more aggressive approach to training. I view it as a tremendous benefit for our technicians, but we must all be proactive, training will not occur by itself. See you at the workshop!

Outstanding Personnel

The Peterson ADL is featuring SSgt Chris A. Clarke, NCOIC of the Fixed Metal Prep & Polish Section, as the outstanding NCO. Sergeant

Clarke has been in the Air Force for 9 years, and is a career airman. Chris was born in Waterville Maine, and was raised in Plymouth, Maine, graduating in 1986 from Nokomis High School in Newport. He and Shirley have been married 7 years, and have two children, Seth 3, and Mamie 16 months. He has a degree in Dental Laboratory Technology, and is only 5 semester hours from earning a BS in Management with a GPA of 3.65 on a 4.0 scale. SSgt Clarke was NCO of the Quarter, and has received a Commendation Medal and an Achievement Medal, and is a Distinguished Graduate of the NCO Prep and ALS Courses. Chris is the ADL Quality Coordinator, and on the Gold Register. His interests include music, art, chess, and horseshoes. He participates in the MARFANS Support Group in his spare time. SSgt Clarke credits his drive and determination to stop a project in question at any stage of development and strive for a better quality product, ensuring customer satisfaction.

The Peterson ADL is featuring SrA Jeffrey P. Carlson as an outstanding airman. Airman Carlson has been in the Air Force for 3 1/2 years, and has re-enlisted for an additional 4 years. Jeff was born in Worcester, Massachusetts, one of nine children, and raised in Southbridge, graduating from high school there in 1992. He has been married to Renee for 3 years. Jeff is presently earning a degree in Dental Laboratory Technology with a grade point average of 3.5 on a 4.0 scale. He was chosen Airman of the Quarter for the 21st Medical Group, and served as chairman for the 1995-1996 Combined Federal Campaign. He also serves as a member of the Social Activities Committee and Quality Air Force Team. In his spare time he enjoys golf and basketball, and serves on the PAFB Golf and Softball Teams. Airman Carlson says the artistry involved in his job allows him the personal individual touch to enhance his customer's life with a smile.

ADLibs

Peterson Area Dental Laboratory Information Letter

20 December 1996



RPD FRAMEWORKS

Everyone is probably aware that Peterson ADL is now fabricating all CONUS RPD frameworks. We have more than doubled our framework output, but have yet to receive any technician authorizations from Barksdale. Out of necessity, we had to move many fixed technicians into the removable section. This transition put a large strain on the ADL, and turnaround times went up. Although days in lab have fallen to more comfortable levels, turnaround time remains a concern.

TURNAROUND TIME

Problems with turnaround time are anticipated for Peterson ADL from January to May 1997. This period is normally our peak season, and in 1997 we will be hosting the workshop, preparing for an HSI and QAFA, and possibly starting our consolidation. Rest assured that we welcome all your submissions, and will continue to provide to you the most expedient service possible. However, Barksdale ADL may have significantly shorter turnaround times for fixed prosthodontics. We strongly encourage you

to call for turnaround times from Barksdale and Peterson during this period to actively manage this aspect of your practice. We would like to know what an acceptable fixed prosthodontic turnaround time is for you. My own standard is to attempt to keep provisional wear below 3 weeks. Consider that shipping to us and back can eat up 10 days. That leaves only 11 days to complete the case at the ADL. Currently, we are running at 15 days. How valuable would due dates be to you? If it takes you 5-6 weeks to re-appoint a patient, our efforts to keep turnaround time at a 10 or 15-day level may be unimportant. We would like to hear from you on this matter. POC is Dr. Curtis at DSN 834-1621.

EDM

EDM is now the standard for fitting implant frameworks, and Peterson ADL has a machine. With EDM, plastic fittings can be used for copings with no loss of a fit. Please take advantage of this capability.

TRIPLE TRAYS

We receive a fair number of casts on triple trays. If these are done properly, they work well, and may be the technique of choice when single anterior crowns are done in arches without posterior occlusion. If you choose to use triple trays, obtain the proper hinges ("articulators") when you buy the trays. Triple trays do not work well when mounted on standard articulators.

LOW FUSING PORCELAIN

Peterson ADL is considering the acquisition of the Ceramco low fusing porcelain system. The system has a complete line of shades and modifiers, and polishes easily to a very nice luster. From the prosthodontist's perspective, the most relevant thing about the low fusing porcelains is their purported low wear of opposing, natural teeth. Unfortunately however, there is controversy about how teeth are worn by porcelain. According to ceramics experts, the hardness of the ceramic material is not nearly so important as the micro-structure of the ceramic surface. Thus, Inceram core material seems to wear natural teeth less than conventional porcelains, even though it is harder and has an "orange peel" texture. In any case, the low fusing porcelains are worth looking into, and the start-up costs are not high. We may offer a hands-on course for this material at the workshop.

QUALITY FORMS

Please return the quality forms quickly to us. Your feedback on the quality of our work helps us immensely. We are now using the data as "metrics" and are directing our continuing education from your comments. We will only be using forms that are returned within 3 months of our case completion date for our metrics.

INFECTION CONTROL

All material that is sent to the ADL, including casts, impressions, bite registrations, etc., should be properly disinfected. However, we are required to re-disinfect everything we receive unless there is a statement on the

DD Form 2322 saying that it has already been done. The statement should read "THIS CASE HAS BEEN PROPERLY DISINFECTED BEFORE SHIPMENT."



Lateral Retraining into the 4Y0X2 Career Field

I recently attended the Utilization and Training Workshop at Sheppard. One of the primary topics of discussion was the retraining of our dental assistants into the laboratory. As things stand now, we are not being very successful in encouraging our first term assistants to retrain. In fact, we currently have only one application for both the February and April classes. The February class in all probability will be canceled. Plans for the April class are bleak at best. Involuntary retraining of our assistants is not a viable option at this time. Bottom line is, we must encourage more of our assistants to take advantage of what I believe would be an excellent opportunity. Please take time to talk to the assistants in your clinic, and bring them back to the lab to let them get their "hands wet". The laboratory is a great career field, and we must do everything we can to insure it remains that way. Happy Holidays from the entire Peterson ADL!

ADLibs

Peterson Area Dental Laboratory Information Letter

28 March 1997



WORKSHOP 1997

Many thanks to all who made Workshop 1997 a great success. We had many comments saying "this was the best ever workshop". Hopefully, we will have many more meetings.

The workshop costs money in per diem rates, and also in lost production at the Area Dental Laboratories. However, we believe it is a worthwhile meeting, and can show that it is cost-effective compared to civilian offerings. We will need the support of all our customers to continue the workshop. If you feel it is worthwhile, please let your commander know.

Our laboratory is now returning to normal after the hectic workshop weeks. Turn-around times are still high at approximately 30 days for both fixed and removable.

E-MAIL

Hopefully, everyone has started receiving weekly E-mail messages from Peterson ADL. It is our plan to keep you informed of our turn-around times, and to give you a projection on what they will be like for the following month.

Furthermore, by the time this letter reaches you, we will have started sending case tracking information. The most useful part of this will probably be "shipped cases". With this information you will be able to appoint your patient as soon as you see that we have mailed your case back.

The best alternative is for us to E-mail this information directly to the Flight Commander or Flight Chief of the dental laboratory. Unfortunately, the worldwide directory only includes the E-mail addresses of the Squadron Commanders and their assistants. If you have E-mail in your dental laboratory, please send me this address at scurtis@spacecom.af.mil.

EMPRESS AND CRACKS

Recently, a number of Empress crowns have been returned with cracks. There are several possibilities. From my own experience, the most likely is that the crown cracked during occlusal adjustment or polishing. Empress is very sensitive to overheating during these procedures. Take care and time.

The other possibilities are that the crowns left Peterson cracked, or that they were cracked during shipping. Hopefully, either of these are rare occurrences.

KAVO TRAPS

Nearly anyone who has KAVO equipment knows there is a problem with the traps - they stink. We have discovered a low cost solution to the problem.

Olson Laboratories Inc., P.O. Box 171, Port Washington, WI 53074 (414) 284-9755 puts out a disposable trap system. The cost for the complete trap is \$46.95 for 3.5 gallon and \$49.95 for 5 gallon. Replacement containers cost \$15.95 and \$18.95. These seem to be a big improvement.

QUALITY PROGRAMS

"Quality Programs" can mean different things at different bases. Most dental laboratories have some type of program; however, there seems to be confusion on how to proceed. At Peterson ADL we have been using the seven-step model for identifying and examining problems. It has been useful, and we would like to share it. Admittedly, a 50-man ADL is different than a 5-man base laboratory, but the same principles can apply.

Some of the metrics Peterson ADL uses come directly from the back of the quality control form. One area Peterson ADL has had success in is reducing the amount of occlusal problems reported in fixed restorations (hopefully this translates into less chairside problems!) Attached is the rationale and formalization of our means for attacking the problem.

DD FORM 2322

Please fill out the DD form 2322 completely. When a change on your case is needed, we would like to quickly phone you to verify this. It is much more difficult for us if you do not fill out the top of the 2322. Please fill out all sections including the top. Include the DSN number where you can most easily be reached.

Last fall we started using epoxy dies for Empress inlays and onlays. With stone dies, almost every returned quality control slip for this type of restoration was a complaint (fit, margins, etc.) Using the epoxy dies, feedback has been much better.

Empress is abrasive before it is finished. With inlays and onlays, the geometry of the restoration allows much contact between the restoration and the die margins during seating. Even if the technician is very careful, it is likely that the die margins will be abraded. We tried using multiple dies, and this did not completely alleviate the problem. Epoxy dies have.

If you are concerned about the shrinkage of epoxy, there are several good articles in the February and March Journals of Prosthetic Dentistry. The bottom line is that modern epoxy dies are as accurate as stone.

If you are making Empress inlays and onlays, do one of two things: 1) Send us a pinned epoxy model. We have been using "DIE EPOXY" American Dental Supply Inc., 2600 William Penn Highway, Easton, PA. 18042, (800) 558-5925. Care is needed to avoid bubbles, but the material is relatively easy to work with. 2) Send us the impression with or without a pinned stone cast. Sometimes the stone casts are useful.

REMOVABLE PARTIAL DENTURES REPLACING ANTERIOR TEETH

When anterior teeth are replaced using

EPOXY DIES

RAPS (reinforced acrylic pontic system), braided posts, Visiogem, or most any other system besides open retention, a go-by cast or diagnostic wax-up must be included.

When RAPS are used, the best technique is to set the teeth on a baseplate, try them in and finalize the set-up, and then send this to us with a plaster matrix relating the artificial teeth to the master cast. If this is not feasible, we must have the artificial tooth shade as a minimum.

All of the articles above were written by Dr. Steve Curtis.

SEPARATIONS AND PCS'S IN/OUT

SrA Brian Kertesz will separate from the service in Apr 97. Since our last newsletter, we have had two new personnel assigned. SSgt Elenamay Miranda and SSgt Melvin Bingham III both came to us as part of the new dental assistant retrainee program. SSgt Ann Sims left us late Nov 96 for Kadena AB Japan. SrA Wade Sawaya is leaving us in Jun 97 for Ramstein AB Germany, SSgt Jeff Schattilly will be leaving for Kadena in Aug 97, and SSgt Deb Grunewald will be going to Lakenheath in Nov 97. They will all be missed.

- SSgt Trish Murphy

OUTSTANDING PERSONNEL

SrA Rebecca J. Naranen

We are all very proud of SrA Rebecca J. Naranen. After moving up the ladder to win Air Force Space Command Airman of the Year here at Peterson AFB, she went on to

win Air Force Dental Services Airman of the Year, a very prestigious award. Becca works in our supply section at the ADL, as well as working as a technician in the Fixed Department. Becca was born in Puyallup, Washington in 1971 and graduated from Franklin Pierce High School in 1990. After attending Green River Community College, she enlisted in the Air Force and was called to active duty in March of 1992. After completing technical training as a Dental Laboratory Apprentice, she served a 2-year tour at Kadena AFB, Okinawa. She was assigned to Peterson in 1994. Becca serves as treasurer of the High Frontier Chapter of the Noncommissioned Officers' Association (NCOA). She is married to Kelly Benson.

SMSgt (Sel) Scott A. Robinson

Everyone here at the ADL is very proud to be working with SMSgt (Sel) Scott Robinson. Not only has he excelled in making the rank of SMSgt, he also received two awards this past year. Scott was selected as Senior NCO of the Year for the 21st Dental Squadron and the 21st Medical Group. In 1995 he was selected as the Air Force Space Command and Air Force Dental Services Senior NCO of the Year. He has received numerous decorations. Scott was born in Bloomington, Indiana in 1960. He graduated from Central High School, Davenport, Iowa, in 1978. He received his Bachelor of Science Degree in Occupational Education from Wayland Baptist University in 1987 and two associate degrees. SMSgt (Sel) Robinson entered active service in 1981. After attending technical training as a Dental Laboratory Specialist, he was assigned to various locations. In Jul 94 he was assigned to the ADL at Peterson AFB, where he is the NCOIC of the Fixed Department. SMSgt (Sel) Robinson is very active in many organizations and was selected as an Examiner for the National Board for

Certification (NBC) and became the Orthodontic Consultant for the NBC. Scott is married to the former Teresa Karpowich of Madrid, Spain.

Congratulations to Scott and Becca for all their outstanding accomplishments!

- Kathy Valin

ADLibs

Peterson Area Dental Laboratory Information Letter

19 May 1998



ADL CONSOLIDATION

The Peterson-Barksdale consolidation is complete. All systems are running, including InCeram and Empress. The ADL now has 93 personnel.

ADL AUDIT

As you know, the Air Force is considering Peterson Area Dental Laboratory for outsourcing and privatization. This issue is still unresolved, and is being elevated through our chain of command. We will keep you informed of any significant developments.

CASE SUBMISSION

There are a number of problems we see daily. Following are suggestions to ensure we handle your case in the most efficient manner.

1. ALWAYS fill out the top of the 2322 completely: **Include the DSN phone number.**
2. Our default for porcelain cutback is to end in the central groove for all teeth except the

lower first bicuspid, which will receive a porcelain occlusal. If you want a different design, be very specific on your request.

“Metal occlusal” means both shearing and stamp cusps will be fabricated in metal. This necessitates a small metal collar extended onto the facial surface of maxillary and mandibular teeth.

“Metal occlusion” means stamp cusps in metal. This necessitates facial metal show on all mandibular teeth, and on maxillary teeth when they are in cross bite or edge-edge occlusion.

It is probably best to avoid these terms because of the confusion they create. I would suggest a description of where you want the cutback to end; i.e., central groove, lingual incline of facial cusp with ‘A’ contact in metal, lap metal onto facial 0.5mm, etc.

Some doctors draw a picture of the cutback design on the SF 2322. This is an easy and efficient way to ensure you get the proper product. Three-dimensional drawings can be sent on “go-by” casts.

3. Use a cast/hinge system designed for triple trays. W.O.W. works well. Contact them at 800-248-2746.

4. Diagnostic wax ups and/or go-by casts are indispensable for many cases. In a study, Peter Dawson sent teeth numbers 6-11 fixed cases to several different dental laboratories. He did not include a diagnostic wax-up in the submission. He found that incisal edge

position varied as much as 5 mm between laboratories. This is not clinically acceptable.

Please send us go-by casts for anterior reconstructions. Incisal edge position, midline, and tooth shape and proportions are the important parts of a go-by cast. We will try to duplicate these, and improve other areas. If we must change important aspects of the go-by, be specific on what you want. For example, there is often insufficient reduction to allow us to duplicate incisal edge position esthetically. Let us know if you want us to keep porcelain thickness optimal and alter the incisal edge position slightly, or keep our restorations very thin to duplicate the incisal edge position.

5. Our default is to apply porcelain butt margins on teeth numbers 4-13. If there is not an adequate shoulder, we will use a thin metal collar. Remember, a porcelain butt is best accomplished with a shoulder 1.0 mm wide. This shoulder cannot form an angle with the emergence profile more acute than approximately 60 degrees. Therefore, for most teeth, the shoulder cannot be steeper than 120 degrees. If your shoulder is steeper, and an esthetic margin is necessary, the emergence profile will be bulky.

6. Inadequate cast work is a chronic problem. Following are suggestions to maximize your success:

a. Pour alginate impressions within 12 minutes. Use a quick acting disinfectant.

b. Measure your stone and water every time. Stone is available in prepackaged amounts. At Peterson, we use packages and a plastic syringe to measure water.

c. Check your casts--remove bubbles, tissue areas that contact (do not forget

maxillary anterior lingual), and inaccurate areas.

d. Check to assure your casts fit together properly without a rock, and that wear facets line up and touch. Most of us use polyvinyl siloxane for a master cast and alginate for the opposer. This combination has inherent errors. Therefore, you may need to adjust the casts slightly to allow them to replicate the patient's clinical occlusion.

7. InCeram and Empress preparations require more refinement than PFM or gold restorations. Sharp corners or rough margins that may slightly compromise a metal restoration may make an all-ceramic restoration unmanageable.

8. Finally, remember that Dr. Curtis and Dr. Salamander are easily accessible if you have questions, comments, problems, or need patient treatment consultation. We now have cordless phones, and you may call us directly at DSN 834-1623 (Dr. Curtis) or DSN 834-1606 (Dr. Salamander).

Medical Group Consolidation

The 21st Medical Group of Peterson AFB may soon be part of the 10th Medical Group at the Air Force Academy. This has not been finalized yet, but either way, it will not effect our service to you.

ADL Workshop

The rumors are true. We have broken a long line of tradition, and will not hold the ADL Workshop in winter or spring of 1998. The result of Dr. Curtis's E-mail query was 43 votes for October and 17 for July. We will hold the workshop **14-16 October 1998** at the Sheraton Colorado Springs Hotel.

Early to mid fall is a logical time for the ADL to sponsor this event. Fall workload is approximately 50% of winter or spring workload. Furthermore, weather in Colorado is most stable during fall. We will try this period for the workshop. If there are too many problems associated with it, we will try some other time.

Included with this mailer are our initial workshop letters. Please fill them out and return them ASAP.

PORCELAIN

Peterson ADL will be changing porcelains soon. We have settled on either Vita VMK 95 or Creation porcelain from Jensen. VMK 95 is very similar to both Vita Omega and 3M (Shofu). I find it impossible to tell them apart. Creation porcelain is highly fluorescing and has a slightly different look to it. Teeth are also highly fluorescing. Therefore, Creation may solve some of the value and color shift problems observed when lighting is changed. We will ask for specific feedback on the QC cards we send with each case. Your timely return of those cards will aid our decision making process.

E-MAIL

E-mail is a wonderful tool. I use it weekly to dispense information from the ADL. However, addresses change frequently. Please communicate E-mail address changes to me at scurtis@spacecom.af.mil

SHIPPING AND RECEIVING

Please note the direct numbers for Shipping and Receiving: DSN - 834-1625 and Comm. - (719) 556-1625.

HAILS AND FAREWELLS

Everyone at the ADL is happy to welcome the following newcomers:

MSgt Francisco J. Pizana
 TSgt John A. Eisenmann
 SSgt Michael L. Buszka
 SSgt Amy P. Wagner
 SrA Wesley W. Erickson
 SrA Erick J. Hanson
 SrA Francisco J. Sanchez
 SrA Rex M. Wilson

We will all miss our technicians who have been at the ADL a long time. MSgt Michael Corder has retired. SSgt John Rohde has crossed over to a new career field-- Recruiting. SSgt Tony Sena has left the Air Force for a teaching career, and SrA Michael Collier has separated. SSgt Larry Corman has PCS'd to Osan.

SMSgt Scott A. Robinson will PCS to Kadena in June. He will be missed by everyone, having been a leader here at the ADL for a long time.

STEVEN R. CURTIS, Lt Col, USAF, DC
 Assistant Director, Area Dental Laboratory

OUTSTANDING PERSONNEL

Mr. William J. Torres

Willie is one of our many outstanding civilian employees. He is a master GS-9 ceramist with 20 years of experience and is vital to ceramics training. He is our "go-to" guy when we have a problem. Willie began his dental laboratory career in 1973 as a graduate of New York Community College's Dental Laboratory Technicians' School. He then served 8 years on active duty in the US Navy, and went on to the Naval Reserves. His experience also comes from having worked in several civilian laboratories across the country. Willie has been with our ADL since 1983. He has experience in all aspects of the dental laboratory field, and is a fine technician who chose to specialize in ceramics. He has been married to his wife Ada, who is a college English professor, for 24 years. They have a daughter Melissa, a college sophomore, and a son William Jr., in seventh grade. When he isn't busy with his family, Willie is often assisting people with their home improvements, as he is an avid plumber and electrician, and has dabbled in framing and construction. He is a native of Brooklyn, New York.

SSgt Robert E. Pfeifer

SSgt Pfeifer has one of our most challenging jobs as the NCOIC of the Training Team, and is currently training twelve 3-level technicians. Bob is the ADL's resident expert of the Empress Ceramic System. He is also the NCOIC of the Resource Protection Program with an inventory of \$25,000 in precious alloys. SSgt Pfeifer's hobbies include mountain biking, cooking, and baking. Bob is also the President of the ADL's Social Committee, which plans and organizes social

events to enhance the morale of the men and women at the Peterson ADL. He was born in Long Island, New York, and entered the Air Force in 1984 as a Security Policeman. He retrained into the Dental Laboratory field in 1988. He has been assigned to the Lowry and Peterson ADLs since August, 1988. SSgt Pfeifer and his wife Denise have been married for 17 years.

SrA Michael D. Sodmont

SrA Michael D. Sodmont is one of our exceptional young laboratory technicians working on Team 1 of the Fixed Department. Two years ago he was a fixed prosthodontics apprentice, and he now has a promising career as a laboratory technician. His additional responsibilities include being a member of the ADL's Casting Team, alternate Data Entry Clerk, and a member of the 21st Medical Group's Search and Recovery and Mobility Teams. Mike was born in Johnstown, Pennsylvania in 1975 and entered the Air Force in November, 1994. His assignments have included F. E. Warren AFB and Peterson AFB. Mike is also very active in support of other group, squadron, ADL, and dormitory activities. He enjoys all of the outdoor activities that Colorado has to offer and pursues those interests every chance he gets.

ADLibs

Peterson Area Dental Laboratory Information Letter

3 Dec 98



ADL WORKSHOP

The 1998 Peterson Area Dental Laboratory Workshop, held at the Colorado Springs Sheraton from 14-16 October, was a huge success.

Squadron Commanders: Budget now for next year's Workshop! This year's meeting provided 18 hours of continuing education with no registration fee--a best-value for your CE dollar. In the future it will be even more cost-effective because we will lengthen the hours. Furthermore, since this is the largest Air Force dental meeting of the year, we will emphasize restorative dentistry and prosthodontics, thus making it more valuable to general practitioners.

WORKSHOP HIGHLIGHTS

1. Colonel Bill Taylor and Chief Glen Kennedy from HQ USAF/SGWD covered forced dental laboratory retraining, the 4-year sign-on bonus, a star for the Dental Corps, and the current USAF Dental Service organizational structure.

2. Dr. Salamander reviewed the new Peterson Area Dental Laboratory Default Standards (see attachment). These standards direct the technician's actions when clear instructions are missing from the DD Form 2322.

3. Dr. Curtis spoke on laboratory communication. Common to most problems was a lack of complete, concise instructions. Consider your prescription from the laboratory technician's viewpoint: Are misinterpretations possible? Is it technically possible to make the prosthesis you are requesting?

SPECIFIC SUBMISSION PROBLEMS

Nomenclature: The most reliable source of nomenclature is the Glossary of Prosthodontic Terms, Sixth Edition, (Reprints: Mosby, Inc, \$14 each, 1-800-325-4177, ext. 4350). Terms like Modified Sanitary Pontics, Ivanhoe Clasps, or Palatal Blankets are open to interpretation. Design casts, drawings, photographs, and proper terminology will help ensure your desired result.

Space for restorative materials: Minimum tooth reduction requirements for esthetics, strength, and/or function are: Metal occlusal 1 mm, porcelain occlusal 2 mm, and porcelain facial 1.5 mm. Esthetics, strength, and/or function may be compromised with inadequate tooth reduction.

All-Ceramic Restorations: Empress and InCeram require bulk for strength. This is most critical on the palatal surfaces of maxillary anterior teeth. One-millimeter

palatal surface reduction is essential; class two, division two malocclusions may be a contraindication to these restorations.

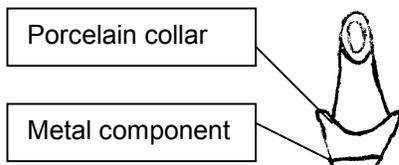
NEW PORCELAIN

Responding to your demand for more life-like porcelain, Peterson ADL has two new porcelain systems: Vita VMK 95 and Jensen's Creation porcelain. Also, we have the porcelain to support Vita's new Vitapan 3D-Master shade guide for both metal-ceramic and all-ceramic applications. This new shade guide is extremely easy to use, and the colors actually match real teeth.

IMPLANT TECHNIQUE

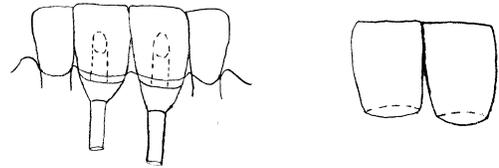
Implant techniques are a moving target. They evolve toward convenience and ease, all else being equal. For restorations involving more than one implant, many dentists are fabricating abutment posts individually to each fixture, analogous to prepared teeth. A conventional FPD is fabricated over the posts.

To fabricate an abutment post, start with a UCLA-type abutment. If the subgingival margin is deeper than 2 mm, there are two choices: 1. Add wax to the collar (before investing and casting) to bring the margin up to the desired depth below the gingival crest. 2. Cast first, and then add porcelain to bring the margin closer to the gingival crest.



Place the abutments and torque to specifications.

Make a conventional impression of the abutments, and fabricate a fixed partial denture. This restoration is cemented onto the posts.



In this technique, the required accurate, passive fit is limited to single implant fixtures and their respective abutments. This negates the need to correct for casting errors normally associated with multiple abutment fixed partial dentures.

Furthermore, one can achieve a precision fit between the implant fixture and abutment by using a "cast to," UCLA abutment, or by removing casting graininess with electron discharge milling (EDM).

Manufacturers have responded to these techniques with angled UCLA abutments, fixture level abutments that can have porcelain added directly, and other toys to make our life easier.

ADL WEB SITE

The ADL has a web site. It is spacecom.af.mil/21/mdss/index.htm.

Steven R. Curtis, Lt Col, USAF, DC

ADLibs

Peterson Area Dental Laboratory Information Letter

April 1999



CHALLENGES

Area Dental Laboratories are an integral part of the USAF dental service. In addition to producing dental prostheses, ADLs are a reservoir of laboratory expertise, where NCOs and airmen learn to manage USAF dental laboratories for future assignments throughout the world. Part of the management process is benchmarking. Peterson Area Dental Laboratory must use the private sector as a performance benchmark. To that end, dental laboratory operations must change in three major ways.

1. We must perform technical procedures more efficiently. Peterson ADL is currently incorporating Productivity Training Corporation practices. **A bonus of technical efficiency is reliable turnaround times.** For the past 3 months Peterson ADL has turned around, on average, at least 95% of one to three unit cases in 14 days, 4-6 unit cases, PLVs, and Empress in 20 days, and larger cases in 25 days. Using FedEx or UPS to control transit time to the ADL will allow you to schedule insertion appointments on the day you prepare teeth. Please note: we will ship your case to you using the

same method you used to ship your case to us. Let us know the insertion appointment date in section 26 of the DD Form 2322 so we can plan to meet your deadline.

2. Our accounting systems must change. In order to compare apples to apples (i.e., a more accurate business case analysis) and to parallel the accounting system used on the clinic side of the house, the Tri-Service dental laboratory consultants developed a plan to convert CLVs to Dental Laboratory Weighted Values (DLWVs) some time in fiscal year 2000. The appropriate approval authority is currently reviewing the plan. We'll inform you if, and when, the new accounting system is deployed.
3. Finally, dental laboratory services must change their business and technical policies to more closely resemble private enterprise. This new paradigm has clinical and business case analysis implications. We, as dentists, must become more cost conscious in our prescription writing. The principle is simple: If the prescription is complex, the laboratory "bill" will be more costly, the turnaround time may be longer, and your clinic's "profitability" will be less. Please use the ADL's Default Standards as an aid to laboratory prescription writing. Most notably, our civilian counterparts, as well as many military doctors, prescribe porcelain occlusal surfaces for their metal-ceramic restorations. Because of the high prescription rate for this type of restoration, the Peterson ADL default standard will be a "POC" (porcelain occlusal).

QUALITY CONTROL

On the Provider Feedback section of the yellow quality control card we send with each fixed prosthodontics case, there is a list of six product quality areas we ask you to score: interproximal contacts, seating, occlusion, contours, margins and esthetics. This scoring process will be most helpful and effective if we are all using the same scoring criteria and tools. Tolerances for margins, interproximal contacts, and occlusion are easier to measure than seating, contours, and esthetics. This is how we assess the products before we ship them:

Margins:

Clinical acceptability for margin openings is 0-100 micrometers (May, KB et al., J Prosthet Dent, 80 (4), p 394-404 1998 Oct). We measure margins under a measuring microscope.

Interproximal contacts:

Ideally, one piece of shimstock should pass through the contact, and two pieces should hold in the contact between the prosthesis and the adjacent tooth on a solid cast (Boice, PA et al., J Oral Rehab 1987, v 14, p 91-94; Campagni, W.U., J of Ca Dent Assoc, 1984, v 12, p 21).

Occlusion:

Cusps should be placed in fossae or on marginal ridges. Unusual cases may require different alignment. Smaller cases with relatively few units should drag shimstock when the casts are articulated, while natural teeth on each side of the prostheses should hold shimstock. Larger, more extensive cases should hold shimstock when articulated on an articulator. Natural teeth should also hold shimstock.

SUBMISSION STANDARDS

Attached is a "quick-look", one-page version of the ADL submission standards. Since the dentist is both the supplier and the customer of the fabrication process, following these guidelines will help us fabricate the quality product you desire.

ADL WORKSHOP 2-4 NOV 99

Peterson ADL will host the annual Area Dental Laboratory Workshop 2-4 Nov 99.

Squadron commanders, please remember this meeting is a great continuing education bargain. Plan to send at least one officer and one laboratory technician.

Lecturers are still needed. This is a great opportunity to share ideas and techniques, not to mention a great bullet or two on your OPR or EPR. If you have a prosthodontically related topic you would like to present, please contact Doctor Curtis at DSN 843-1621.

Colorado is a great place to visit in the fall. The weather is normally very stable with temperatures in the 50s or 60s. Hiking, rock climbing, sightseeing, fishing, and hunting will be at their prime.

Steven R. Curtis, Lt Col, USAF, DC
Flight Commander, Area Dental Laboratory

Peterson Area Dental Laboratory

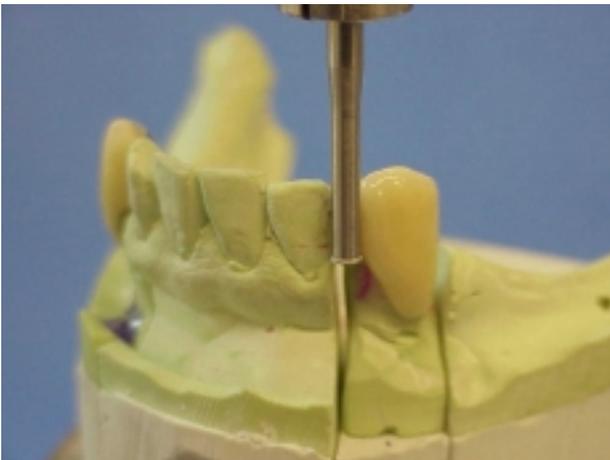
Information Letter

10th Dental Squadron/USAF, Colorado

25 February 2000

Design and Fabrication of Surveyed Crowns

The need for a cast restoration on the abutment tooth of a removable partial denture (RPD) requires careful, all-inclusive diagnosis and well-designed treatment planning by the restorative dentist. Surveyed crowns are the cornerstones of a stable and retentive removable prosthesis that must be designed and planned for during the initial phases of dental treatment. Your Peterson Area Dental Laboratory (ADL) has lots of experience in fabricating well-fitting restorations that will support and retain a RPD. And with proper planning on your part, the selected treatment will likely have a successful outcome based on the esthetic and functional needs of the patient.



Surveyed crowns #22 and 27 undergo final ADL inspection to ensure undercuts, guide planes and rest seats are placed according to prescription.

Treatment Planning: The need for a crown on a RPD abutment tooth may result from causes such as caries, fractures, defective existing restorations, negative tooth vitality, and poor shape or angulation. Surveyed crowns require significant comprehensive diagnosis and treatment planning before ever considering tooth preparation for the fixed restoration. As with all complex cases, accurate diagnostic casts should follow a comprehensive clinical examination. The patient's pulpal

and periodontal health and any required treatment should be determined in support of the patient's restorative needs. New periapical radiographs should be made of all teeth evaluated for surveyed crowns and recent radiographs made available of the remaining dentition to supplement treatment planning.

The RPD framework should be surveyed, designed and **completely** outlined on the diagnostic casts. A surveyor is a necessity....don't leave home without it! The surveyed crown restorations should be planned to fit the pre-determined RPD design. At this point, all other periodontics, endodontics, oral surgery, operative dentistry, etc., should be accomplished before rendering definitive fixed or removable prosthodontic treatment.

Removable Partial Denture Rest Preparations:

After survey and design of the diagnostic casts, prepare **all** RPD rest preparations and guide planes on the patient. It is important to do this for two reasons. First, it is a lot easier for the dental laboratory to wax a surveyed crown to your already prepared guide planes and rest seats than it is trying to cut preparations in the mouth after the crown is inserted. And second, the final impression of the surveyed crowns allows you a "free" look at the rest preparations etc., and a chance to make corrections before the RPD final impression is made.

Retainer Tooth Preparation: The tooth preparations for the surveyed crowns may now be accomplished. Be sure to prepare the tooth with the RPD path of withdrawal in mind. The surveyed crown may not necessarily follow the long axis of the tooth because of the path required for the RPD. Axial surfaces may need to be reduced more than normal in order to achieve proper room for adequate undercuts, reciprocation, and guideplane formation. Additionally, resistance and retention in the form of boxes, grooves and potholes may be required to resist the stress of the RPD clasp assembly.

For rest seats, 2.0-2.5 mm reduction is required at the marginal ridge areas. The rest seat should be spoon shaped with further reduction at the base of the seat. This clearance allows for a minimum crown thickness of 1.0 mm in the occlusal rest seat and 1.0-1.5 mm for the RPD metal framework at the marginal ridge. 2.0-2.5 mm clearance is required at the base of the occlusal rest seat.

This reduction is especially important on anterior teeth such as maxillary canines. We often see under-reduction in these regions which result in the crowns being overcontoured. Make a full arch final impression that captures not only the crown preparation, but that accurately reproduces the contours and preparations of the other RPD abutment teeth.

Provisional Restorations: Allow adequate time for this procedure. Provisional restorations made under existing RPDs are best made by making a coping that is not touched by the seated denture, then brush beading the acrylic resin within the clasp assembly to final contour.

Wax Pattern Fabrication: After normal contour has been established in the wax, the cast is removed from the articulator and placed on the surveyor. The original path of withdrawal is re-assessed. When the cast tilt for final path of placement has been selected, the cast is marked at three points. The “tripodizing” allows the re-establishment of the selected path. Final evaluation of the surveyed contours is made by dusting the pattern with waxing powder. The height of contour is marked with the analyzing rod and the undercut measured with the appropriate gauge.

Guide planes should be prepared and evaluated. As a rule of thumb, guide planes should be about 2/3 as wide as the distance between the tips of adjacent buccal and lingual cusps and should extend vertically about 2/3 the length from the marginal ridge to the gingival tissue.

Occlusal rest seats are made with a discoid carver and measured to assure at least 1.0 mm thickness of wax. The outline form of the occlusal rest seat should be “rounded” triangular shape (spoon-shaped) with the apex toward the center of the occlusal surface. The rest seat should be as long as it is wide, and the base of the triangular shape should be at least 2.5 mm. The marginal ridge of the abutment crown at the site of the rest seat must allow sufficient bulk of metal for strength and rigidity of the RPD rest and minor connector. This means there should be clearance of 1.0-1.5 mm at the marginal ridge and 2.0-2.5 mm at the rest seat base. Avoid sharp edges or line angles in the wax-up.

The angle formed by the occlusal rest and the vertical minor connector should be less than 90°.

Cast Gold Surveyed Crowns: Cast gold crowns are re-evaluated on the surveyor prior to patient try-in. Ensure that proper contours, undercuts, etc. have not been polished away or otherwise altered during the casting procedure.

Cast crowns are tried in the patient and adjustments made for fit and occlusion. Castings may be picked up with alginate, then slurry stone poured into the impression and lubricated crowns. This solid pick-up impression allows additional surveillance of contours. Alternatively, the crowns may be removed from the pick-up impression and simply poured as usual. However, this procedure only allows one reliable adjustment of the crowns

Metal Ceramic Surveyed Crowns: Retentive arms can be successfully placed on glazed porcelain. Rest seats, guide planes, and lingual bracing arms are best placed in metal. Rest seat should be located in metal at least 1.0 mm from the metal ceramic junction.

Resin-Veneered Surveyed Crowns: Traditionally, these are not indicated. However, the exception may be with resin-veneered crowns opposing resin teeth of a complete or partial denture. In this case allowance should be made on the crowns for the RPD denture clasp tip to rest against a window of metal.

One final note: before sending your case to the ADL, please take a moment to critique your own tooth preparations to verify you have met reduction and clearance guidelines. If these guidelines have not been met, please consider re-preparing the teeth. Otherwise, you risk receiving surveyed restorations that are overcontoured or high in occlusion. Providing us with good tooth preparations will help us provide you with the very best restorations possible!



BGen (Sel) Murray Visits ADL

BGen (Sel) Murray presents an Achievement Medal to SSgt Patricia E. Murphy. Achievement Medals were also presented to TSgt Robert E. Pfeifer and SSgt Kenneth V. Cammarato.

The ADL recently welcomed BGen (Sel) Gary H. Murray, Commander, Air Force Medical Operations Agency and Assistant Surgeon General for Dental Services to Peterson AFB. BGen (Sel) Murray toured the facilities and met with ADL personnel to not only see new technical procedures and streamlined production operations, but also to better understand dental laboratory issues and concerns.

We appreciate BGen (Sel) Murray taking time from his busy schedule to address the ADL troops and make presentations to the staff. Achievement Medals were presented to TSgt Robert E. Pfeifer, SSgt Kenneth V. Cammarato and SSgt Patricia E. Murphy on behalf of the 10th Medical Group.

***QC Forms: Your "Bridge" to Success
in Fixed Prosthodontics***
by MSgt Francisco Pizana, Jr.
NCOIC ADL Fixed Department

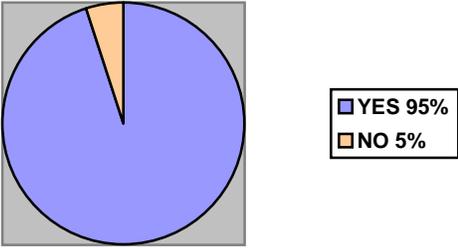
Allow me to introduce myself, I'm MSgt Francisco Pizana, Jr. the NCOIC of the Fixed Department at your CONUS ADL, located at Peterson AFB in beautiful Colorado Springs, Colorado. As the NCOIC of the Fixed Department, I will write articles in future ADL Newsletters addressing important issues of the fixed department. These articles will address your questions, concerns and other dental laboratory issues. The purpose is to improve communication and increase the service we provide you, the customer!

I would like to start off by strongly encouraging you to fill out and return the Peterson ADL's Quality Control Form. You may have noticed we recently redesigned our quality feedback forms to improve communications between you and the ADL. Your feedback is very important to us, no matter whether it is positive or negative. We learn from both! Last fiscal year, 55% of the Quality Control Forms were returned to the ADL from the field. This year the response has not been as great. Please note the low QC return rate on the ADL Report Card below. The good news was that 93% of our fixed dental prostheses were inserted and only 7% were remakes. Please indicate whether the remake was due to clinical or laboratory error. The staff of the fixed department is dedicated to fabricating the highest quality restorations possible. With your help, by providing timely and accurate feedback, we can ensure our products meet and exceed your expectations.

If you have any immediate questions or concerns, please feel free to contact me at DSN 834-1600 or via e-mail: francisco.pizana@peterson.af.mil.

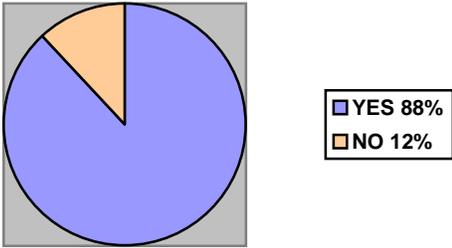
***ADL Report Card:
Customer Satisfaction Rate
FY 2000 1st Qtr***

Fixed Restorations...were you satisfied with the Quality?



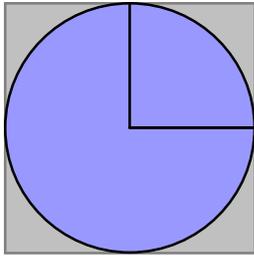
Fixed QC Response Rate: 242 of 900 cases or 27%

Removable Frameworks...were you satisfied with the Quality?



Removable QC Response Rate: 58 of 300 cases or 19%

Acrylic Restorations...were you satisfied with the Quality?



■ YES 100%
 ■ NO 0%

Acrylic QC Response Rate: 59 of 219 cases or 27%

***Chrome Corner...Rappin' about
 RAPs***

*by MSgt Robert Berkeley,
 NCOIC Removable Partial Dentures*

A major area of concern for the Removable Partial Denture Department is the matrices for RAP (Reinforced Acrylic Pontics) fabrication that we receive from various base laboratories. Some problem areas are matrices being very bulky and/or made of flexible material such as Reprosil. Both problems create inaccurate matrices.

We prefer that the matrix be made of dental stone. It should be 2.0 mm thick over the incisal edges of RAP and adjacent natural teeth. The matrix should include the lingual-incisal line angles of all teeth but should not extend onto the lingual surfaces of any teeth. It should extend 2/3 down the facial surfaces of the teeth toward the gingival margin. It is crucial that it horizontally cover at least ¾ of the width of the facial surface of the adjacent natural teeth.

Another problem we commonly see with requests for RAP fabrication is that no acrylic teeth are sent with the case. The base laboratory is required to fit the acrylic resin teeth to the edentulous ridge so that the prescribing dentist can verify the color, contour and position of the RAP teeth before the ADL fabricates the metal RPD framework. Also, please check the occlusion and both lingual and facial alignment prior to shipping to the ADL. In order to produce the best prosthesis possible for the patient, we request that these guidelines be followed.

For questions, you can reach me at the following address: robert.berkeley@peterson.af.mil

Acrylic Shavings...

Orthosis Fabrication

By TSgt Richard Torres, NCOIC Acrylic Resin

In order for us to better serve you and your patients and provide the highest quality appliance possible, please include interocclusal records with clean, accurate casts when submitting a case for orthosis fabrication.

Most cases are mounted in maximum intercuspation (MI), but there are times when the occlusion is in question. Accurate casts with stone nodules removed from the occlusal surface are a must. Additionally, interocclusal records are needed to ensure accurate mounting of the casts and provide the best opportunity for accurate fit of the appliance.

When fabricating the orthotic appliance, vertical dimension of occlusion is opened a minimum of 2.0 mm at the closest point to allow space for acrylic resin. If more of an opening is desired, please include an interocclusal record made at the desired vertical dimension of occlusion. This will allow us to make the appliance at the desired thickness. If slight variation is requested from the interocclusal record, please annotate on the DD Form 2322.

These hints may reduce insertion adjustments and clinical chairtime, while increasing patient comfort and satisfaction.

As always, your feedback is important and appreciated. Please return our Quality Control forms with any comments or concerns.

richard.torres@peterson.af.mil

Chief's Comments

By CMSgt Michael Bonner, Manager, ADL

If you're a SrA or SSgt looking for a change of pace, the Peterson ADL is currently advertising assignments on Equal Plus. As we are now a Special Duty assignment, there are certain qualifications that must be met. If you have any questions or concerns, please just call us here at the ADL, and we can provide whatever information you need. You can also fax your application directly to us, (DSN 834-1605) and we will forward to HQ USAFA/DPAA. The requirements and other details can be accessed by going to:

<http://afas.afpc.randolph.af.mil/jobs/eplu gr.htm>

Also, the new CFETP is out. You can access it by going to:

<http://sg-www.satx.disa.mil/af dental/>

- Go to:
- a - Hot Topics
 - b - USAF Dental Service Guides
 - c - 4y0x2

Tips from the Technicians

Compiled by SrA Ann Morris

Here at the Peterson ADL, we have many outstanding dental laboratory technicians who have many great ideas, and we thought it would be a shame to keep these ideas to ourselves! So we would like to share these techniques with you! If you have any ideas you feel

others can benefit from, please contact me at DSN 834-1608, and we will try to get them into our newsletter.

? *Contributed by TSgt Elisha Cumbie and Mr. Terry Winn:* When luting wax bridges together, use Zapit to prevent rocking. Wax can shrink or expand your restoration before your investment sets up. **IMPORTANT:** Do not spray the accelerator on the wax pattern since it can break down the wax. Instead, drop a small amount of the accelerator directly on the Zap-it.

? *Contributed by SSgt Mike Buszka:* Use a dry erase marker on your die when you are seating your crown. The dry erase marker will come off easily and will only show the true high areas.

? *Contributed by SSgt Conrad McCloskey and SrA John Donaldson:* To prevent solder from overflowing when soldering full gold appliances, paint a barrier with a mixture of Zapit accelerator and Rouge. This will come off easily when polishing.

? *Contributed by Mr. Ron Hill:* When indexing a cast, the prescribed length of a die (from the base to the bottom of the margin) should be 6-12 mm. When the dies are too long, they become unstable and cause a slight rock.

? *Contributed by SSgt Conrad McCloskey:* When you are casting Olympia (Jelenko) type metal and notice contamination in your melt, sweep a carbon rod through the metal. **IMPORTANT:** Do not use pencil lead because modern pencil lead is polymer-based instead of clay-based. Polymer-based pencils have a tendency to shatter when they get too hot. (NEY makes carbon rods).

Peterson ADL Web Page On-Line!

The Peterson ADL web page is now on-line! Still under construction, we are currently posting submission standards, product lines, and turnaround times. A special feature is the display of case status reports. We will update our web page report detailing when we received your cases, what stage of fabrication they are in (wax-up, casting, finishing, etc.) and when they were shipped. The intent is to keep you informed on the progress of your cases and aid in the scheduling of your patients in anticipation of the prosthesis arrival. You can also find copies of the ADL Newsletter and information about upcoming Workshops on the web page. The page can be found under the United States Air Force Academy 10th Medical Group home page. The address is:

<http://www.usafa.af.mil/sg/adl/default.htm>

PTC Teaches Dental Laboratory Technology Course at ADL

Productivity Training Corporation (PTC) founder John C. Ness, CDT recently visited the Peterson ADL to provide an intensive technical management training course to our team leaders and key technicians within the

fixed department. The goal was to provide our ADL the management and technical training to develop middle management skills to grow with maximum quality and efficiency.

The three-day PTC management and hands-on program addressed all aspects of establishing and maintaining a laboratory's high quality technical product. Called the PTC Skill Learning Systems®, this course, in addition to 3 cycles of hands-on experience under PTC supervision, teaches our supervisors not only how to use the systems, but also how to teach them effectively.

TSgt Michael Cumbie, our Director of Training and Education, is responsible for the on-going training of our other technicians. His training is based on using the PTC Training Verification System 2000™, which is composed of 31 video training programs, 9 technical management manuals, standard support materials and special instruments. The verification skill drills, along with close supervision by PTC staff of all course work, ensures that quality production is maintained consistent with our technical policy standards. Our trained supervisors then perpetuate and maintain the ADL's technology.

We believe this training will help raise quality, consistency, efficiency and productivity of our ADL. Please continue to let us know how we're doing! For further information on this training program, please contact TSgt Michael Cumbie.

michael.cumbie@peterson.af.mil



PTC founder John Ness (center) with ADL NCOIC of Training and Education TSgt Michael Cumbie (left) and ADL Flight Commander Col Douglas Evans (right).

E-mail Address Update

Please be sure to include your e-mail addresses on the DD Form 2322 when submitting your cases. Sometimes we have questions concerning your case and are unable to connect with you by telephone due to patient treatment, TDYs, leave, exercises, etc. E-mail is a reliable method to communicate with you, especially

those of you at overseas facilities. Thanks for your support!

Federal-Express Contract

The Peterson ADL has recently contracted the mailing of all our outgoing cases through Federal-Express starting 15 Feb 00. Our contract is for Priority Overnight delivery from our facility to yours. However, Fed-Ex requires the physical address of your facility for all shipping. **If you are sending us cases from overseas, please be sure to send us your physical facility address for door-to-door Federal Express shipping.** If you only give us an APO address for example, Federal Express will ship to San Francisco and then the military postal system will take over. This will likely cause delays in you receiving your case.

Peterson ADL Workshop Update

The ADL Workshop held 2-4 November 99 was a huge success! Many thanks go to all the attendees who made the trip to Colorado Springs for the event. A special thanks goes to all the outstanding presenters and the behind the scenes staff that made it all possible!

The next Workshop is already planned for 13-15 Feb 2001! Please mark your calendars and budget now! We plan on having another superb venue of lecture presentations, hand-on courses, and commercial exhibits. We look forward to seeing you here in '01!

Metal-Free Esthetic Posts

Are you interested in placing an all-ceramic crown on an endodontically treated tooth.... but don't want the traditional gold or base metal post and core to show through the crown and ruin the esthetics? To help correct this problem, the Peterson ADL is now offering the CosmoPost (Ivoclar North America), a zirconium oxide tapered post. It is white and thus eliminates the gray shadow of metal or even carbon fiber posts for optimum esthetics. The CosmoPost is indicated especially for all-ceramic crowns such as IPS Empress (Ivoclar North America), and is reported to have high flexural strength. The CosmoPost is waxed to and then pressed with the new IPS Empress Cosmo Ingot for a one-piece esthetic post and core.

If you request a CosmoPost, please provide a final impression and solid master cast for indirect fabrication. Direct patterns cannot be used in this technique.

Certified Dental Technician Examination Update

We are in the process of organizing a Certified Dental Technician (CDT) National Board Practical Examination at the Peterson ADL. The tentative test date is 17 February 2001 following the ADL Workshop. As you may know, Certification is a national testing and standard-setting program established by and for those practicing in dental laboratory technology. The Board Examination is composed of three parts, the comprehensive, written and practical examinations

The practical portion is a five-hour, in-laboratory examination testing technician abilities in procedures commonly associated with practice in a selected specialty. Eligibility for CDT testing expires four years from the date you passed the Comprehensive examination. Overseas waivers for the four-year expiration date are given through the National Association of Dental Laboratories (NADL). For waivers, contact the NADL home office through e-mail at nadl@nadl.org or through the NADL web site <http://www.nadl.org>

If you are interested in challenging the CDT practical examination, please contact Col Doug Evans or SSgt Robert Gutierrez. We need 20 candidates in order to host an examination. So please get in touch with us if you are interested!

Current Case Turnaround Time as of 25 February 00

1. Acrylic Section – 6-8 duty days
2. RPD Section – 10-14 duty days
3. FPD Section – 10-14 duty days

Please call for Rush cases and other special needs.

For planning purposes, please note these are "in-house" turnaround ranges, and do not reflect case transit time. As mentioned earlier, we have recently contracted with Federal Express for Overnight return delivery to you. Similar guaranteed shipping from your facility will allow you to accurately project scheduling dates for your patient.

As always, we appreciate your business!

ADL Hail and Farewells!

Arrivals:

Colonel Douglas Evans is the new Area Dental Laboratory Flight Commander and arrived from Kadena AB, Okinawa. He received his Doctor of Dental Surgery degree from The Ohio State University College of Dentistry, a certificate in Prosthodontics from Wilford Hall Medical Center at Lackland AFB, and a Master of Science in Prosthodontics degree from The University of Texas Health Science Center at San Antonio. Dr. Evans

also completed a Dental Materials Research Fellowship at The University of Michigan in 1996. Col Evans is a Diplomate of the American Board of Prosthodontics.

SSgt Stephen Alvers arrived from Scott AFB, IL

SSgt Olen Moore arrived from McChord AFB, WA

SSgt Anthony Rangel arrived from Sheppard AFB TX

SSgt Teres Cooksey arrived from Sheppard AFB, TX

SrA Robert Gutierrez arrived from Dyess AFB, TX

Departures:

SSgt Nicholas Brookins, - Separated in December 2000

TSgt Sengpeth Posarath – PCS'd to Hickam AFB, HI in January 2000

SSgt Wesley Erickson – Separated in February 2000

Projected Departures:

SSgt Amy Wagner will separate in March 2000

SSgt Mark Smith will separate in April 2000

Peterson Area Dental Laboratory

Key Personnel

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Mrs. Kathy Valin, Secretary

DSN 834-1600 kathy.valin@peterson.af.mil

//Signed//

DOUGLAS B. EVANS, Col, USAF, DC
Area Dental Laboratory Flight Commander
10 DS, Peterson AFB, Colorado

//Approved//

M. Regan Salamander, Col, USAF, DC
Area Dental Laboratory Director
10 DS, Peterson AFB, Colorado

Peterson Area Dental Laboratory

Information Letter

10th Dental Squadron/USAF, Colorado

5 September 2000

Pontic Design for Fixed Partial Dentures

Pontics are fixed partial denture components that replace missing teeth and restore appearance, function, and phonetics. Oftentimes, the edentulous areas where a fixed partial denture is to be placed may be overlooked during the treatment-planning phase. In these cases, the design of the pontic may not be considered until the master cast is prepared, and the case is sent to the dental laboratory.

Proper diagnostic evaluation for a fixed partial denture includes careful analysis of the critical dimensions of the edentulous areas. The examination should include the buccal-lingual ridge dimension, the mesiodistal edentulous length, and the occlusogingival height. If the pontic space has been reduced due to migration of adjacent teeth, orthodontic movement or modification of the abutment teeth should be planned. A careful diagnostic wax-up will help determine the best course of treatment. Disregard for the available space may result in an undersized pontic that will likely trap food debris and be an esthetic failure.

Residual ridge contour and texture must also be considered. An ideal ridge will be broad and smooth with no signs of inflammation. Hyperplastic tissue should receive periodontal treatment and/or be surgically removed if required.

Patients with severe residual bone resorption following tooth loss can present a significant esthetic challenge. In these cases, surgical ridge augmentation should be considered prior to tooth preparation. If left untreated, large defects in the edentulous ridge often require large, over-contoured pontics to fill the space. Access for proper oral hygiene is usually compromised in these situations.

Form and shape of the gingival surface must be evaluated in order to design a pontic that will meet biologic, mechanical, and esthetic considerations.

Biologic Considerations: The biologic principles of pontic design relate to the maintenance and preservation of the residual ridge, abutments, opposing teeth, and the supporting tissues. Specific factors of

influence include good oral hygiene, ideal pontic-ridge contact, and occlusal harmony.

Oral Hygiene: Tissue inflammation of the edentulous ridge can be caused by the release of toxins from microbial plaque. Patients must be taught to perform efficient oral hygiene techniques, with particular emphasis on cleansing the gingival surface of the pontic. The shape of the pontic tissue-surface will influence the success of the restoration. Ideally, all contours should be rounded and convex.

Resistance to plaque accumulation also depends on the smoothness of the material used. Many clinicians prefer glazed porcelain against the edentulous ridge. However, although glazed porcelain looks very smooth, microscopically its surface can be seen to contain voids and may actually be rougher than polished gold.



Metal ceramic fixed partial denture #12-14 with modified ridge lap pontic #13. When esthetics is important, the pontic should appear to be “growing” out of the gingival tissue.

Nevertheless, highly glazed porcelain is relatively easy to clean, making plaque removal easier than from other materials. Well-polished gold is also resistant to initial plaque accumulation. However, it has been shown that even highly polished surfaces will accumulate plaque if oral hygiene measures are ignored. Because of their porous nature, and the difficulty in obtaining a highly polished surface, resins should not be used on pontics near the tissue.

Pontic-Ridge Contact: When esthetics is a concern (such as the maxillary arch and mandibular anteriors), the pontic should contact the gingival tissue on the labial or buccal aspect of the ridge to give the appearance of emerging from the tissue. To create this illusion, the tissue surface of the pontic must passively contact the ridge along the facio-cervical line-angle. The design best suited for esthetics with the facial surface shaped to simulate normal tooth structure but with a convex lingual surface is known as a **modified ridge lap pontic**. With this design the pontic tissue surface must be convex in all directions.

In posterior regions (i.e., mandibular molar and premolar areas) where esthetics is not the primary concern, focus should center on occlusion, function and hygiene. A **bullet-shaped pontic** is probably easiest for the patient to clean. It is made as convex as possible with only one point of contact at the center of the residual ridge. This design is recommended for the replacement of mandibular posterior teeth where esthetics is less of a concern.

Normally, where tissue contact occurs, the gingival surface of a pontic is inaccessible for cleaning with a toothbrush. If a pontic has a depression or concavity in its gingival surface, plaque will accumulate there because floss cannot clean this area and tissue inflammation will result. A pontic with a concave fitting surface that overlaps the residual ridge buccally and lingually is called a **saddle or ridge lap pontic** and should be avoided because the gingival surface cannot be easily cleaned.

A pontic that does not contact the tissue is known as a **hygienic or sanitary pontic**. The hygienic pontic is used primarily in nonappearance areas. It restores occlusal function and stabilizes adjacent and opposing teeth. Because there is no requirement for esthetics, it is usually made entirely of gold and is kept away from the ridge for ease of cleaning. The occlusogingival thickness is no less than 3 mm and should have minimal distance of 3 mm from the edentulous ridge.

The hygienic pontic is frequently made in an all-convex configuration, faciolingually and mesiodistally. An alternative design has been suggested in which the pontic is made in the form of an archway mesiodistally, and is known as a **Perel pontic**.

The **ovate pontic** is a bullet or convex-shaped pontic that is placed into a gingival depression made in the edentulous ridge site. Primarily indicated for the anterior region, the ovate pontic depression may result from a recent extraction or from tissue contouring at the edentulous site using electrosurgery instruments. The tissue grows around the gingival 1 mm of the pontic, giving the appearance of a natural tooth/tissue interface.

Occlusal Harmony: A stable occlusion is best achieved by maintaining proper buccolingual pontic proportions. Narrowing the pontic occlusal table will not reduce forces that occur during chewing or para-functional activity. In fact, narrowing the occlusal table may actually impede a stable relationship due to resulting

inadequate occlusal contacts, difficulties in plaque control, or failure to provide proper cheek support.

Mechanical Considerations: The prognosis of the fixed partial denture may be compromised without giving attention to mechanical principles. Improper choice of materials, poor framework design, poor tooth preparation, or poor occlusion can lead to fracture of the prosthesis or displacement of the retainers.

Long span posterior fixed partial dentures are particularly susceptible to mechanical problems. Flexing of the metal due to occlusal forces increases with the cube of the span length. That means a single pontic will deflect a small amount (x) when subjected to a certain force. Two pontics will deflect 2³ times as much (8x) to the same force, whereas three pontics will deflect 3³ times as much (27x). In these long span instances, a strong all-metal pontic may be required rather than a weaker metal ceramic pontic.

Esthetic Considerations: An esthetically successful pontic will replicate the form, contours, gingival margin, incisal edge, gingival and incisal embrasures, and color of adjacent teeth.

Pontics should represent the missing tooth in terms of occlusogingival height and mesiodistal width. The features of the contralateral tooth should be duplicated as precisely as possible in the pontic. If space discrepancies exist, the pontic space can be restored esthetically by matching the location of the line angles and adjusting the interproximal areas.

For more information on available pontic systems and their design, please feel free to give us a call!

***Dental Laboratory Technology: Q&A
in Fixed Prosthodontics***
By SMSgt (Sel) Francisco Pizana, Jr.
ADL NCOIC

Staff Sergeant Don Scott from Scott AFB, IL submitted the following question:

SMSgt (Sel) Pizana:

What is the ideal clinical tooth preparation for a porcelain butt margin that will result in a most lifelike porcelain fused to metal crown from my laboratory?

Dear SSgt Scott:

A metal-ceramic restoration is where a veneer of porcelain is bonded to an underlying metal substructure. This type of restoration enables the dentist to provide the patient the esthetic and biological advantages of porcelain, plus the fit, strength, and durability of the ceramic alloy. Also, porcelain is impervious to mouth fluids, color-stable, and is resistant to abrasion.

In order to provide the patient with a lifelike restoration, the dentist is obligated to reduce the facial surface of the tooth at least 1.5 mm. The ideal preparation for a collar-less crown is a 90-degree shoulder preparation on the facial that extends from one

proximal surface to the other. All porcelain junctions must not be feathered at the porcelain-to-metal junction. If so, the porcelain would be more likely to chip during functional movements or flake off during seating! Also, all junctions between porcelain and metal on the external surface of a restoration should be as close to a 90-degree angle as possible. (See Figure 1.)

The combined thickness of metal and porcelain on the facial surface of metal-ceramic crowns should be at least 1.2 to 1.5 mm thick to meet minimum strength and shade requirements. You must have at least 0.3 mm metal thickness in the porcelain bearing areas to keep the substructure from flexing under stress, thus fracturing the applied porcelain.

The opaque layer needs to be 0.1 to 0.2 mm thick to perform its masking function. The dentin and enamel porcelain should be 0.8 mm thick or thicker (if space permits) to reproduce the shade labeled on the bottle. More porcelain may be needed in the incisal portion because of the added translucency in this area. Ideally, metal-ceramic restorations should be made so that porcelain can be uniformly applied in thickness that do not exceed 1.5 mm on the facial and 2.0 mm on the incisal. (See Figure 2.) A thin uniform thickness of porcelain supported by rigid substructure offers the most strength. This is truly a team effort between the dentist and the dental laboratory technician! I hope the question, and especially the answer will be beneficial to all dental laboratory technicians. Keep those questions coming! Sincerely, F. P. Jr.

If you have any immediate questions or concerns, please feel free to contact me at DSN 834-1600 or via e-mail: francisco.pizana@peterson.af.mil

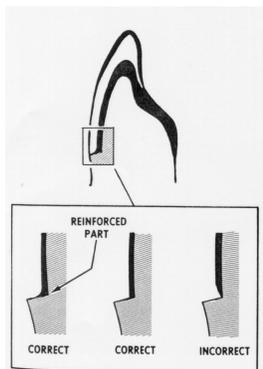


Figure 1

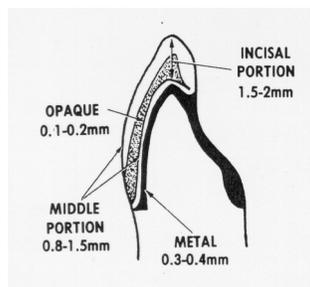


Figure 2

Reference: AF Pamphlet 162-6, Vol. 3, pages 108 & 133

Noble Alloys...and Princely Prices

The noble metals include gold, platinum, palladium, rhodium, ruthenium, iridium, and osmium. Noble metals are chemically inactive and resist corrosion and tarnish. Of the seven noble alloys, gold, palladium and platinum are currently of major importance in dental casting alloys.

GOLD! Chemical element Au, gold is a dense, lustrous, yellow precious metal of Group Ib, Period 6, of the periodic table. Gold has several qualities that have made it exceptionally valuable throughout history. It is attractive in color and brightness, durable to the point of virtual indestructibility, highly malleable, and usually found in nature in a comparatively pure form. The history of gold is unequalled by that of any other metal because of its value in the minds of men from earliest times.

Gold is one of the heaviest of all metals. It is a good conductor of heat and electricity. It is also soft and the most malleable and ductile of metals; a troy ounce (31.1 g) can be beaten out to 187 square feet (about 17 sq m) in extremely thin sheets called gold leaf.

Because gold is visually pleasing and workable and does not tarnish or corrode, it was one of the first metals to attract human attention. Examples of elaborate gold workmanship, many in nearly perfect condition, survive from ancient Egyptian, Minoan, Assyrian, and Etruscan artisans, and gold has continued to be a highly favored material out of which to craft jewelry, dental restorations, and other decorative objects.

Owing to its unique qualities, gold has been the one material that is universally accepted in exchange for goods and services. In the form of coins or bullion, gold has occasionally played a major role as a high-denomination currency, although silver has generally been the standard medium of payments in the world's trading systems. Gold began to serve as backing for the 19th century, and from the 1870s until World War I, the gold standard was the basis for the world's currencies. Although gold's official role in the international monetary system had come to an end by the 1970s, the metal remains a highly regarded reserve asset, and approximately 45 percent of all the world's gold is held by governments and central banks for this purpose. Gold is still accepted by all nations as a medium of international payment.

Gold has been the standard for fabricating cast dental restorations since the late 19th Century because it is a noble alloy, it is easily cast, it is malleable, and it wears favorably against natural dentition. In the early 1980's, gold prices rocketed to over \$700 an ounce, partly as an inflationary hedge and in response to high oil prices. Eventually gold prices have stabilized near \$275 per ounce (see Table).

Alloy	Price 23Oct 80	Price 6 Jan 97	Price 20 May 99	Price 3 Aug 00
Gold	\$711.00	\$358.50	\$274.20	\$271.90
Palladium	\$201.32	\$117.80	\$327.00	\$720.00
Platinum	\$671.36	\$362.75	\$356.00	\$570.00

Malleable platinum is obtainable only upon purification to essentially pure metal, and was first produced by the French physicist P.F. Chabaneau in

1789; it was fabricated into a chalice that was presented to Pope Pius VI. The discovery of palladium was claimed in 1802 by the English chemist William Wollaston, who named it for the asteroid Pallas.

Since pure annealed platinum is extremely soft, it is susceptible to scratching and marring. In order to improve hardness, it is alloyed with a variety of other elements. Platinum jewelry is very popular in Japan, where it is called hakkin, or "white gold." Alloys for jewelry castings include 90% platinum-10% palladium, which is readily worked and brazed. Adding ruthenium to platinum-palladium alloys increases their hardness while maintaining their oxidation resistance.

Platinum is used in the semiconductor as well as dental industry because of its corrosion resistance and stability at high temperature. Platinum-rhodium alloys are employed in the production of thermocouples that are capable of measuring temperatures as high as 1,800° C (3,270° F). Palladium is used in both the pure and alloyed states for a variety of electrical applications (accounting for 50% of consumption) and for dental alloys (30% of consumption).

The following alloys are used at the ADL:

	Jensen Type II	Firmilay Type III	Jelenko #7 Type IV	Olympia	Jelenko "O"
Au %	77	74.5	68.75	51.5	87.32
Pd %	1	3.5	3.35	38.4	5.94
Pt %			2.9		4.49
Ag %	13	11	12.4		1
In %			0.25	8.5	0.3
Cu %	8.5	10.495	12.34		
Zn %		0.5			
Ir %		.005	0.01		.05
Ru %				0.1	
Ga				1.5	
Sn					0.4
Fe					0.5

Although noble alloy prices are known to fluctuate, the Air Force has a contract for direct purchase from the Defense Supply Depot for some gold alloys. Please be sure to order items from the Depot using the national stock number (NSN).

You will find this less expensive than purchasing gold directly from the manufacturer...even at the government price!

If there is no NSN, call the company directly for Government Pricing. For Jelenko products, the Government Sales Representative is Ms. Rosa Santana and is the only one authorized to offer 50% government discount on Jelenko products. She can be reached at 1-800-431-1785 ext 242 or n.santana@jelenkois.com. For example, the ADL pays \$14.40 a strip for 585 solder, and \$14.30 a strip for 650 solder when purchased directly from Jelenko.

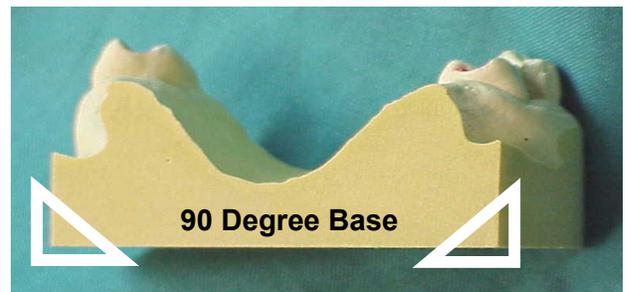
Some useful NSN numbers for gold alloys include:

Firmilay Type III: NSN 6520-00-145-0176
Jelenko #7 Type IV: NSN 6520-00-145-0349
Olympia: NSN 6520-01-154-1733
Jelenko Olympia Pre-solder: NSN 6520-01-188-5347

Trimming Casts Can Be Fun and Easy!
By MSgt Robert Berkeley
NCOIC Removable Partial Dentures

We have received many master casts that are either trimmed improperly or not at all. The major problem areas are casts that are trimmed at a taper and casts that are overly bulky. We prefer casts that are trimmed at a 0° taper. This allows for more efficient duplication process. Master casts that are overly bulky sometimes don't fit in the duplication flasks and require further trimming. A major area of concern is thickness in the heal areas which sometimes make casts too tall to fit in our flasks. The sides must be trimmed as close as possible for the same reasons above. Please reference the picture below.

If you have questions, you can reach me at the following address: robert.berkeley@peterson.af.mil



Proper trimming of RPD master cast

Chief's Comments
By CMSgt Michael Bonner, Manager, ADL

With the end of summer upon us, we here at the ADL hope you all took some time out of your busy schedules to take a well-needed break. We are gearing up to continue to provide you the best support possible from our staff. Just a couple of things you can do to help us better help you:

1. For our overseas customers, please provide us with your facility's physical address. We are currently utilizing FedEx as our primary shipper, and they do not deliver to APO/FPO addresses. If we do not have your physical address, we must ship via United States Postal Service (USPS). Since the USPS only serves the United States, your cases are transferred to the Military Postal System (MPS) once they reach the stateside port, and most of us know how cumbersome the MPS system can be at

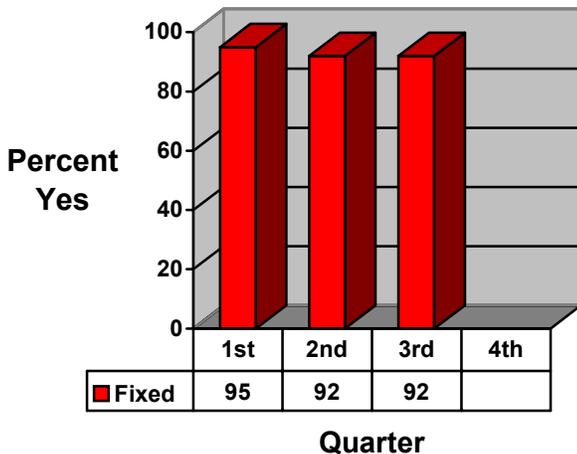
times. With a physical address we can return your cases much sooner. For our stateside customers, please ensure we have a Dental address and not your orderly room. FedEx will deliver directly to whatever address you provide.

2. We have put together an e-mail group of base laboratory NCOICs. If your lab NCOIC is not receiving e-mail from us, please provide us with an address. This includes our Army and Navy customers.
3. When you review our Quality Control information, you will notice that our response rate for fixed cases was 48%, and for removable only 25%. We sincerely want to know how we are serving you, so I encourage you to please return the forms, good or bad.
4. Our manning level continues to be below normal. We are in need of about 12 technicians. As I mentioned previously, the Peterson ADL is a beautiful facility and The City of Colorado Springs is a wonderful place to live, whether you are single or have a family. For more information on an assignment here, just give us a call, or you can fax your special duty application directly to us, (DSN 834-1605) and we will forward it to HQ USAFA/DPAA. The requirements and other details can be accessed by going to:

<http://afas.afpc.randolph.af.mil/amsweb/master.cfm>

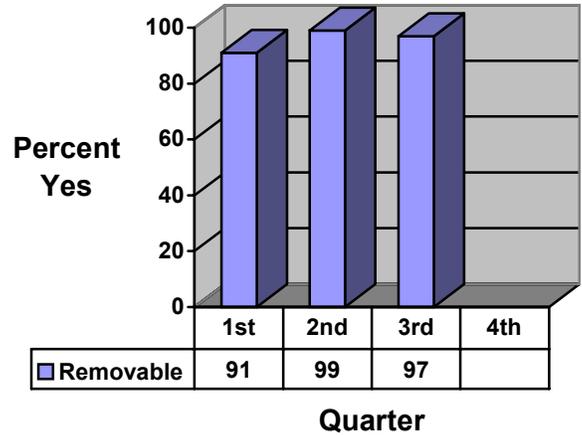
ADL Report Card: Customer Satisfaction Rate...Were You Satisfied With the Quality?

**Fixed Satisfaction Rate
1st-3rd Quarter 2000**



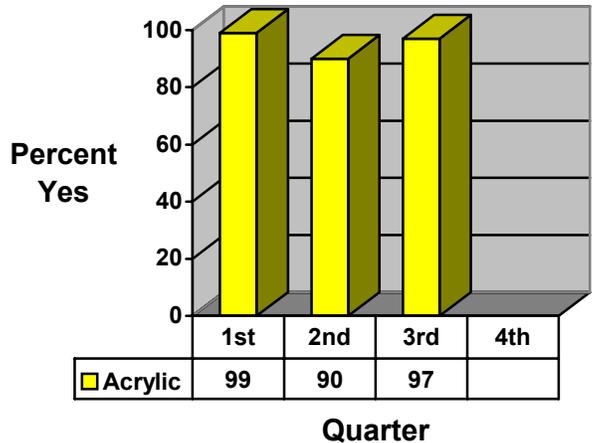
Fixed QC Response Rate: 1134 of 2350 cases or 48%

**Removable Satisfaction Rate
1st-3rd Quarter 2000**



Removable QC Response Rate: 155 of 632 cases or 25%

**Acrylic Satisfaction Rate
1st-3rd Quarter 2000**



Acrylic QC Response Rate: 166 of 476 cases or 35%

Beryllium Exposure in the Dental Laboratory: A Nickel for Your Thoughts?

Many of our popular nickel-chromium base metal alloys used at the ADL for metal-ceramic restorations (Rexillium V, Jeneric/Pentron: 73.0% Ni, 14.0% Cr, 9.0% Mo, 1.8% Be) and removable partial dentures (Ticonium, CMP Industries: 70% Ni, 15% Cr, 5% Mo, >.05% Be) contain beryllium. This particular element is added to these alloys in small amounts to reduce the fusion temperature, improve the casting characteristics, refine the grain structure, and possibly participate in the bonding of porcelain.

Beryllium is highly toxic in its free state. Exposure to beryllium may result in acute and chronic forms of beryllium disease. Workers with acute disease states can experience physiologic responses ranging from contact dermatitis to severe chemical pneumonitis, which can be fatal. The chronic disease is characterized by symptoms persisting longer than 1 year and may include coughing, chest pain, and general weakness due to pulmonary dysfunction. Inhalation of the dusts and fumes of beryllium and its compounds is the main route of exposure. It has been shown that under certain working conditions, such as in the absence of adequate local exhaust ventilation, beryllium in base metal alloys can present a dental occupational health problem. Therefore, in laboratory and clinical situations in which grinding or melting of beryllium-containing alloys is performed, adequate local exhaust ventilation safeguards should be employed, since all forms of beryllium are toxic, and the body cannot excrete beryllium.



SSgt Michael Rinnels, skilled technician in the ADL removable partial denture framework section, displays proper wear of personal protective clothing and equipment when grinding on alloys containing beryllium.

OSHA specifies that exposure to beryllium dust in air be limited to a concentration of 2 micrograms/m³ of air from an 8-hour time-weighted coverage. The allowable ceiling concentration is 5 micrograms/m³, not to be exceeded for a 15-minute period. Additionally, the American Conference of Governmental Industrial Hygienists recently announced that it intends to slash its recommended exposure limits by 90%, from 2 micrograms/m³ of air to 0.2 micrograms/m³ averaged over an 8-hour work shift.

High levels of beryllium have been measured during finishing and polishing when a local exhaust system was not used. When an exhaust system was used, the concentration of beryllium in the breathing zone was

reduced to levels considered safe. In the Air Force, the Bioenvironmental Engineers are required to perform periodic (usually annual but is determined locally) Industrial Hygiene Surveys that include air sample evaluation and evacuation hood inspection. Recommendations are made to correct problems or deficiencies. All dental squadrons are required to have these surveys available.

In many base metal alloys, nickel is found along with beryllium. Nickel and its compounds have been implicated as potential carcinogens and as a sensitizing agent. Since the nickel content of base metal alloys can exceed 80%, precautions should also be employed to prevent the aspiration of nickel-containing dust produced during dental grinding procedures.

Because of the risks involved with grinding and melting both beryllium and nickel, as well as most any alloy, it is imperative that good ventilation and exhaust facilities be employed. Additionally, when handling these materials, the guidelines offered by the OSHA website should be followed.

http://www.osha-slc.gov/dts/hib/hib_data/hib19990902.html

The topics include:

1. Engineering controls
2. Work practices to reduce beryllium exposure
3. Hygiene and personal protective clothing
4. Respiratory protection
6. Training
7. Health screening methods for beryllium sensitization and chronic beryllium disease

The risks presented with beryllium materials are significant. However, research has shown that airborne levels and the associated risks of beryllium can be controlled with proper work practices, respiratory protection, handling techniques and training as outlined above. Please let me know if you have any further questions!

Empress 2 New Product Line for Peterson ADL: A "Glass-Act"

Looking for a new and improved, stronger, more esthetic restorative material? We may have just the answer for you! The ADL recently introduced Empress 2 (Ivoclar North America) into our available product line. The second generation of the "revolutionary system in esthetic dentistry," Empress 2 now offers the ability to fabricate all-ceramic bridges. The new lithium disilicate framework ceramic and the apatite layering ceramic (fluorapatite glass ceramic with apatite crystals) permit the fabrication of all-ceramic restorations that reportedly demonstrate properties similar to those of natural teeth.

Empress 2, as with original Empress, offers two methods of fabrication. The new layering technique of

Empress 2 first fabricates a cutback framework made of lithium disilicate, and then places a ceramic veneer overtop using the apatite ceramic. Indications for the layering technique include: three-unit fixed partial dentures with one pontic and the second premolar as the most distal abutment; and single crowns in the entire dental arch.

The second fabrication method is the staining technique. This technique uses a slightly shaded ingot of leucite glass-ceramic, which has been clinically used for over 10 years. Ingots are also available in 4 degrees of opacity while the dentin stains are in paste form and are baked on to the fully contoured surface. The staining technique is used for inlays, onlays, and veneers.

Preparations:

1. Single crowns: The preparation significantly influences the stability and thus the durability, esthetics, and fit of the restoration. Therefore, the margins must be carefully designed with a pronounced chamfer or shoulder (rounded inner edges). Avoid sharp transitions, inner angles, or feather edge margins. Margins should be a deep chamfer or rounded shoulder: minimum 1.0 mm reduction. Incisal third of the preparation requires minimum 1.5 mm reduction. Occlusal and/or incisal requires minimum 2.0 mm reduction.

2. Inlays: Fissure width: minimum 1.5 mm reduction. Width of the isthmus: minimum 1.5 mm reduction. Proximal boxes should be slightly flared; line angles > 90°. Functional contacts need to be observed.

3. Onlays: Same procedures as for inlay. 2.0 mm of occlusal clearance is required for the cusp areas.

4. Veneers: Preparation margins located in the cervical enamel should demonstrate an inclination of 10-30°. A palatal chamfer is not required; various preparation designs are possible.

Shade Guides

Either the Vita (Vident) or Chromascop (Ivoclar) shade guides can be used. The dentin shade of the prepared tooth is determined by means of the Ivoclar Die Material shade guide. This shade subsequently serves as the ideal basis for the final restoration.

Cementation

The ADL will return your Empress 2 restoration with the internal (intaglio) surface etched. Adhesive cements such as Variolink II (Ivoclar) or Enforce (Dentsply) should be used clinically. If there are clinical reasons that argue against adhesive cementation, crowns and fixed partial dentures fabricated using the Empress 2 layering technique may also be seated with conventional glass ionomer cements or ProTec CEM (Vivadent). Hybrid ionomer cements with higher degrees of expansion than ProTec CEM must not be used. Restorations fabricated according to the Empress 1 or 2 staining technique or the old Empress layering technique must be seated using the adhesive resin technique.

For further information regarding the new Empress 2 material, please call or write MSgt Pete Santaularia (All-Ceramic Production Manager) at: peter.santaularia@peterson.af.mil

A Systematic Approach to Smile Design

What are the principles of treatment planning an esthetic case to ensure a successful outcome? Gerard Chiche, DMD, Professor and chair of the Department of Fixed Prosthodontics at Louisiana State University School of Dentistry and co-author of Esthetics of Anterior Fixed Restorations (Quintessence) may have some answers for us all. In a recent Dental Products Report (August, 2000) interview, he advocates evaluating the patient's smile and breaking it down into six basic elements. While many secondary elements also comprise the smile, Dr. Chiche states there are six primary building blocks to systematically evaluate during the initial analysis process and diagnostic phase. The procedure is as follows:

1. Look at the smile line. Does it follow the lower lip? Is the plane parallel to the inter-pupillary line?
2. Look at the profile of the incisors, do they protrude too far or can they be built out further?
3. Check the length of the teeth. Do they relate to the upper lip normally? Do they need to be made shorter or longer?
4. Analyze the proportions of the central incisors. Are they balanced in shape? Are they too narrow or too wide?
5. Analyze the proportions of the smile from central to lateral to canine. Is more than one restoration needed to balance the proportion of each tooth?
6. Analyze gingival levels. Is gingival recontouring, crown lengthening, or graft procedure indicated?

Dr. Chiche states that this six-step analysis almost always complements what the patient desires. The analysis allows you to simply determine exactly what needs to be done and provides all the options available for best improving a patient's appearance. This in turn allows the ADL to provide the most esthetic restoration(s) possible. And that makes us all look good!

ADL Hosts Sheppard AFB Tri-Service Dental Laboratory Training Staff: A “Dental Investment”

“There’s always room for improvement!” That was the motto of a unique working group formed when staff members of the tri-service dental laboratory training program within the Inter-service Training Organization (ITO) at Sheppard AFB, TX, recently visited the Peterson ADL in Colorado Springs. The ITO team first toured the ADL facility and then discussed with key members of the ADL many of the ways area and base dental laboratories could increase product quality and production. Central to the discussion was the on-going requirement for skilled dental laboratory technicians and how the ITO “schoolhouse” could continue to meet or exceed those needs.

Mr. John Ness, CDT, President and CEO of Productivity Training Corporation (PTC) served as guest speaker and presented proven PTC management and teaching tools used in the civilian dental laboratory sector. Strategies for possible integration into the schoolhouse curriculum were also discussed. Many other perspectives were presented, with both the ADL and ITO dental teaching staff receiving a good understanding of each others capabilities and needs. Future meetings are planned to discuss issues concerning Army and Navy ADLs.

The Peterson ADL would like to thank the ITO staff for visiting our facility and continually striving to improve the quality and skills of their newest dental laboratory technicians. Their dedication to teaching is a true “dental investment” that ensures we have the skilled technicians to deliver you that quality dental restoration!



L to R: MSgt Alan Kietzer, USAF; TSgt Greg Edwards, USAF (Peterson ADL); MSgt Darlene Stonecipher, USAF; DTC Scott Smith, USN; Mr. John Ness, CDT (President and CEO, Productivity Training Corporation); Col Regan Salamander, USAF (Peterson ADL), Lt Col Phil Sandefur, USAF;

SSG Moises Soto, USA, MSgt (Sel) Mike Cumbie, USAF, (Peterson ADL). Photo by Col Doug Evans.

15 Keys to Employee Protection: Infection Control

OSHA (Occupational Safety and Health Administration) mandates using “universal precautions” when the potential exists for contact with any infectious person or item. As we all know, that potential for contact is very great in the dental laboratory setting. An effective infection control protocol established between the dental treatment room (DTR) and the laboratory is the first line of defense for protecting staffs as well as patients from the threat of exposure to an infectious disease.

The second line of defense involves the adoption of the “universal precautions” concept, which assumes that every case you receive is a potential health hazard. This principle, in combination with the following 15 key standards for an effective infection control program in your lab, will help you protect yourself and employees.

1. Practice personal cleanliness: Technicians should wash their hands with an anti-microbial soap before and after gloving, before and after using the restroom, before and after lunch and breaks, and before leaving the lab to go home at the end of the day.

2. Determine area at risk: Evaluate the lab set-up to determine the areas in the lab at risk for infectious contamination, including the receiving area, the cast department, denture repair, and possibly an isolated area or room set aside for patient shade-taking.

3. Establish a designated lunch/break area: Technicians should not eat, drink or use any consumable product in risk areas.

4. Wear personal protective equipment (PPE): Technicians working in risk areas must use proper personal protective equipment: disposable latex gloves or reusable vinyl gloves, safety eyewear or goggles, fluid-resistant gowns, and a surgical mask if required. To prevent cross-contamination, personal protective equipment must not be worn outside the risk area.

5. Protect receiving area equipment: Cover computer keyboards, phones and other equipment in the receiving area with a barrier material that allows them to be disinfected.

6. Rinse, Rinse, Rinse: Cases arriving from the DTR should initially be rinsed in running water. If the case was previously disinfected in the DTR, rinsing removes pooled disinfectant that may hinder an accurate stone pour. If the case has not been properly disinfected, rinsing removes blood and debris from the impression. Manufacturers of most disinfectants state on the label that the disinfectant is effective only on clean surfaces.

7. Use disinfectants properly. If you are not 100% certain that the case has been previously disinfected, you will need to disinfect the case yourself. To ensure the proper performance of any disinfectant, make sure the formulation is appropriate for the case being disinfected;

the dilution is per manufacturer's instructions; and the contact time is in accordance with the manufacturer's instructions. Use the Tuberculosis kill contact time as the standard for length of disinfecting contact.

8. Discard contaminated packaging: If the case received from the DTR or lab did not arrive in a plastic container or bag, the packing material (foam inserts) and shipping box must be disinfected (to prevent bio-waste) and discarded.

9. Disinfect surfaces, countertops, and floors: Work surfaces, countertops, and floors in risk areas must be disinfected at least daily using an appropriate disinfectant and a spray-wipe-spray technique. If a risk area is also used for non-risk procedures, then cleaning and disinfecting must be performed immediately upon completion of the risk procedure.

10. Disinfect and/or discard PPE: Visibly soiled gowns should be discarded; otherwise, disinfect if possible, wash and reuse. Latex gloves and fluid-resistant surgical gloves should be discarded; vinyl gloves and plastic face shields can be appropriately disinfected and reused.

11. Disinfect new exposed surfaces: Trimming back over-extended borders on impressions, separating imbedded appliances from impression material, and grinding and polishing old dentures and partials exposes new contaminated surfaces that must be disinfected. Employees engaged in these procedures should wear PPE.

12. Establish separate denture repair areas: If possible, maintain two separate areas for pumicing and polishing of dentures and partials – one area for repairs, relines and adjustments, another for new work. For new denture work, wheels, brushes and pumice can be used from case to case. For used prostheses, pumice is discarded after each case; wheels and brushes are changed with each case, then bagged and sterilized before reuse.

13. Disinfect prior to shipping: Prior to shipping, cases should be disinfected, rinsed, and placed in plastic bags or containers. Though not an OSHA regulation, it is a courtesy that demonstrates professionalism and mutual concern for the patient and personnel within the laboratory.

14. Provide employee training: Employees (including shipping and receiving personnel) working in an at-risk area must be provided infection control training on an annual basis.

15. Protocol enforcement: Once an infection control program has been established, each safety measure must be enforced. The infection control program should be integrated into other management polices (dental operating instructions) and disciplinary steps put into place to handle employees who disregard the protocols.

New Shipping Boxes Put a Lid on Broken Casts

Perhaps you've noticed that the Peterson ADL has recently been returning your cases in new four-slot shipping boxes. These larger boxes were purchased in response to your constructive feedback saying that the old two-slot boxes were too small and often overpacked, resulting in returned items sometimes being damaged. Because most cases are submitted with a master cast, opposing cast, impression and solid cast, we tested a four-slot box and found it works well for the average case.

The four-slot box, lid and foam inserts are sold as a complete set for \$2.75 each. If you damage or contaminate the four-slot foam inserts, two foam inserts from the old two-slot boxes placed side-by-side will work as well.

Four-slot shipping boxes can be purchased from:

Tharco
13400 East 39th Ave
P.O. Box 39103
Denver, CO 80239-0103
1-800-525-1831



Part #Z68591 A B C

A = Lid

B = Box

C = Foam

Restorations Fit to a Solid Cast: The Solid Facts

Fitting a fixed restoration to a solid cast has many advantages. Because the solid cast has not been cut, sectioned or pindexed for dies, an accurate intra-occlusal relationship exists. Traditional pindexing often causes dies to wiggle and move when the crown or fixed partial denture is seated to the dies. This pin movement in the laboratory often results in tight interproximal contacts in the mouth. Using a solid cast, the technician can accurately adjust interproximal contacts in the laboratory, allowing the dentist to save valuable clinic time and minimize frustration. With virtually no chance of die movement and/or saw blade damage to adjacent cast teeth, restorations that are fit to solid casts require little or no adjustment when tried in the patient (one exception is when the provisional restoration did not have sufficient

interproximal contact and the tooth moved...a clinical fault).

The solid cast also maintains intact gingival contours and allows the dental technician to visualize restoration emergence profile near the cervical region. Additionally, the solid cast permits development of ideal pontic contours on ridge areas versus pindexed casts where stone may be removed during the die trimming procedure.

Finally, the solid cast allows verification of fixed partial denture fit. Again, pindexed casts may result in mobile dies, and the fit may not be an accurate representation of the patient. When a fixed partial denture doesn't fit properly, the solid cast offers an accurate, undisturbed source to obtain a solder relationship.

The Peterson ADL will fit your fixed restorations to a solid cast that is sent in with the case. As a policy change, we will no longer routinely pour a solid cast for us to fit the restoration. We have found that our pouring additional solid casts can introduce several errors and inaccuracies. First is that there are significant setting expansion differences between Modern Material's Die-Keen (0.18-0.2% expansion) which we use, and those of other die stones that are sent to us, i.e., Whip Mix's Silky-Rock (.09% expansion), Hard Rock (.28% expansion) and Modern Material's Die Stone (.07% expansion). Because the expansions can differ by factors of two or almost three, restorations fabricated on one type of stone will likely not fit accurately on another type stone.

Additionally, research has shown that a cast poured in one of the most dimensionally stable materials (addition silicones) is most accurate when poured between 24 hours and 1 week after the impression is made. Due to time required for doctors to trim dies, mount casts, and ship the case, it is not uncommon for the ADL to receive cases weeks and even months after the impression is first made. The impression at this time may be inaccurate.

Due to these reasons, if you would like us to fit the restoration to a solid cast, please provide a solid cast that has been re-poured immediately after the master cast has been poured, and in the same stone type as the master cast and dies. We appreciate your cooperation!

***Peterson ADL Workshop Update:
We're Looking for a Few Good
Presentations!***

The next Workshop is planned for 13-15 Feb 2001! Please mark your calendars and budget now! We are also beginning our search for lecture and laboratory hands-on presentations. The POCs for this event are SMSgt (Sel) Francisco Pizana and MSgt Robert Berkeley. Please contact them at DSN 834-1621 for further information on how you can participate in your next ADL Workshop. Further details and registration

materials will be posted on the ADL Web Page. We plan on having another superb venue of lecture presentations, hands-on courses, and commercial exhibits. We look forward to seeing you here in '01!

***Current Case Turnaround Time
as of 5 September 00***

1. Acrylic Section – 18-20 duty days
2. RPD Frames– 12-14 duty days
3. Fixed Section – 12-14 duty days

Please call for Rush cases and other special needs. For the most current turnaround times, please visit our ADL web page at: <http://www.usafa.af.mil/sg/adl/default.htm> For planning purposes, please note these are "in-house" turnaround ranges, and do not reflect case transit time. As mentioned earlier, we have contracted with Federal Express for overnight return delivery to you. Similar guaranteed shipping from your facility will allow you to accurately project scheduling dates for your patient.

As always, we appreciate your business!

***Certified Dental Technician
Examination at ADL Workshop***

A Certified Dental Technician (CDT) National Board Practical Examination will be offered at the Peterson ADL on 17 February 2001, following the ADL Workshop.

The practical portion is a 5-hour, in-laboratory examination testing technician abilities in procedures commonly associated with practice in a selected specialty. For details of the examination, contact the NADL home office through e-mail at nadl@nadl.org or through the NADL web site <http://www.nadl.org>

If you are interested in challenging the CDT practical examination, please contact Col Doug Evans or SSgt Robert Gutierrez at:

robert.gutierrez@peterson.af.mil

We need 20 candidates in order to host an examination. So please get in touch with us if you are interested!

***Federal-Express Service Continues as
a Huge Success!***

Based on the tremendous response from the field, the ADL Federal-Express shipping contract appears to be a huge success. The Peterson ADL contracted the mailing of all our outgoing cases through Federal-Express this past February 00. Our contract is for Priority Overnight delivery from our facility to yours. How can you help us keep this service working smoothly? We must have a current street address before

we can ship to your facility. Your cases and their status are posted on the ADL Web Page. With FedEx overnight service, you can expect to see your case arriving by 1530 hours on the second business day, so you can schedule your patients accordingly.

ADL Hail and Farewells!

Arrivals:

MSgt Judy Bailly arrived from Travis AFB, CA
MSgt Luis Pacheco arrived from Fairchild AFB, WA
MSgt Nancy Kujak arrived from Bolling AFB, MD
TSgt Eugene Fisher arrived from the Recruiting Service, Hazleton City, PA
TSgt Mitchell Griffin arrived from Scott AFB, IL
SSgt Teres Cooksey arrived from Sheppard AFB, TX
SSgt Michael Domingo arrived from Sheppard AFB, TX
SSgt Brad Hanenkratt arrived from Andrews, AFB, MD
SSgt Derek Lucas arrived from Wright-Patterson AFB, OH
SrA Jason Buckley arrived from McClellan AFB, CA
SrA Daniel Battin arrived from Sheppard AFB, TX
Amn Jennifer Erickson arrived from Sheppard AFB, TX
Amn Erica Johnson arrived from Sheppard AFB, TX

Departures:

Col Regan Salamander - He served as the Peterson ADL Director and Military Consultant to the AF Surgeon General for over 2 years. He is the new Clinical Flight Commander at the USAF Academy.
TSgt Frank Dawkins - Medically retired
TSgt Loretta Archibeque - PCS'd to Kirtland AFB, NM
TSgt Tim Heidger - Retired in Colorado Springs
SSgt Michael Collisi - PCS'd to Lajes Field, Azores
SSgt James McAtee - Separated
SSgt Mark Smith - Separated
SSgt Amy Wagner - Separated
SrA Ann Morris - Separated
SrA John Donaldson - Separated
SrA Wade Sawaya - Separated
SrA Rex Wilson - Separated
GS-9 Terrell Pauli - PCS'd to Sembach, Germany
GS-9 Ronald Hill - PCS'd to Sembach, Germany

Projected Departures:

MSgt Charles O'Hara will retire in September 2000
TSgt Michael Cumbie will PCS to Kadena AB, Japan, March 01
TSgt Elisha Cumbie will PCS to Kadena AB, Japan, March 01
SSgt Robert Balbi will PCS to Andrews AFB, MD via Officer Training School

SSgt Stacey Grice will PCS to Ramstein, Germany in December 2000

SSgt Terry Freeman will PCS to Spanghdalen, Germany in December 2000

SSgt Rupert Young will PCS to Osan AB, Korea in January 2001

SrA Matt Burns will separate in November

Sra Rodney Oxendine will separate in November

ADL Web Page

Please visit our ADL Web Page! We are currently posting submission standards, product lines, and turnaround times. A special feature is the display of case status reports. Each week we update our web page report detailing when we received your cases, what stage of fabrication they are in (wax-up, casting, finishing, etc.) and when they were shipped. The intent is to keep you informed on the progress of your cases and aid in the scheduling of your patients in anticipation of the prosthesis arrival. You can also find copies of the ADL Newsletter and information about upcoming Workshops on the web page!

Peterson ADL Web Page:

<http://www.usafa.af.mil/sg/adl/default.htm>

Other ADL Web Page Sites:

- Ft. Gordon (US Army), GA, ADL:
<http://www.dencom.army.mil/adl/index1.html>
- Kadena AB, Okinawa, Japan ADL:
<http://www.kadena.af.mil/kadena/18wg/18mg/adl/adlhomepage.html>
- San Diego (US Navy), CA, ADL:
<http://ndcsd.med.navy.mil/adl01.htm>
- Sembach AB, Germany ADL:
<https://wwwmil.usafa.af.mil/bases/ramstein/86d/s/adl>

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//Signed//

DOUGLAS B. EVANS, Col, USAF, DC
Area Dental Laboratory Director/Flight Commander
10 DS, Peterson AFB, Colorado

Peterson Area Dental Laboratory Information Letter

10th Dental Squadron/USAFA, Colorado

November 2002



Peterson Area Dental Laboratory Workshop Set for 10-12 February 2003 in Keystone, CO

The Peterson Area Dental Laboratory (ADL) Workshop is scheduled for 10-12 February 2003 at the Keystone Resort in the beautiful Rocky Mountains of Keystone, Colorado! This is sure to be one of the best ADL meetings ever! With over 25 guest lecturers scheduled, the workshop will offer a wide variety of presentations, table clinics, and hands-on demonstrations showcasing the newest clinical procedures and dental laboratory techniques. Over 40 dental manufacturing and



*Keystone, Colorado
Conference Center*

supply companies are scheduled to participate and display their state-of-the-art products. You won't want to miss this year's outstanding conference!

Highlighting this year's distinguished group of speakers will be Dr. E. Steven Duke, DDS, MSD from the University of Indiana; Dr. Michael Gaglio, DDS from Ivoclar Vivadent, Inc.; Dr. James C. Kessler, DDS, from the Medical University of South Carolina; Dr. Mark Latta, DDS, MS from Creighton University; Dr. Ken Malament, DDS, MSc from Boston, MA civilian practice; Dr. William O'Brien, MS, PhD from the University of Michigan; Dr. Larry J. Oesterle, DDS, MS

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from the University of Colorado; Dr. Braden Stauts, DDS from Boise, Idaho civilian practice; and Dr. Keith Thornton, DDS from Airway Management, Inc. We appreciate these fine speakers, as well as our military presenters, for making an outstanding effort to provide us with first-class dental continuing education!



Lodging Facilities at Keystone, Colorado

The Air Force, through Rocky Mountain Blue, has entered into a strategic alliance with Keystone Resort, to help the military community reduce the high cost of conferencing. All room fees are at per diem rates.

Tri-fold program flyers have recently been sent worldwide to clinics and laboratories with more details. In the meantime, room reservations at Keystone can be made by calling 1-800-258-0437. Be sure to give them conference code **CG9CADL** for the per diem room rate.

For further information on the 2003 ADL Workshop, please visit our Peterson ADL web page at <http://www.peterson.af.mil/adl>; the Keystone Resort web page at <http://www.keystoneressort.com>; or call us at DSN 834-1600. We look forward to seeing all of you at the 2003 Peterson ADL Workshop!

Effective Use of the Diagnostic Wax-Up for Clinical and Laboratory Communication

What can you do to facilitate the successful fabrication of a complex or esthetically challenging case sent to the Peterson ADL? Besides providing an accurate impression and master die, you should consider sending a diagnostic wax-up as well. A diagnostic wax-up can be extremely useful in providing a variety of information regarding oral structures that may require restoration. For planned prosthetics in the esthetic zone, the diagnostic wax-up can convey to the laboratory technician morphologic details such as restoration length, width, thickness, contours, emergence profile, embrasure shape, proximal contacts, vertical midline, occlusal scheme, surface texture and incisal edge placement. The diagnostic wax-up enables the clinician to define and deliver an esthetically pleasing outcome. Restoration of the posterior dentition is also facilitated

by use of the diagnostic wax-up. However, the emphasis is shifted from esthetics to function, specifically in areas of occlusion, pontic design, contact areas, and gingival embrasure spaces. Additionally, a diagnostic wax-up can provide important information regarding implant fixture placement and site development using hard or soft tissue augmentation. Not only can the diagnostic wax-up be used to demonstrate the anticipated esthetic restorative result, but the diagnostic wax-up can also function as a patient communication tool. From there, the mounted and waxed casts can be used as a guide during the actual preparation process. The diagnostic wax-up also facilitates fabrication of the provisional and definitive restorations and is a visual guide for the laboratory technician.

Treatment Planning

In complex restorative and implant therapy, particularly in situations involving the esthetic zone, use of a diagnostic wax-up should be routine, as it constitutes the ultimate outcome predictor of the restorative treatment and provides clinically relevant information. This information can be applied throughout the various therapeutic phases to ensure compliance with the anticipated final result. This is particularly important in situations that require multidisciplinary intervention by several clinicians. Strict adherence to the desired restorative outcome defined in the diagnostic wax-up will ensure predictable success. An outcome-based approach that is achieved in part through the use of a diagnostic wax-up will provide a therapeutic blueprint and three-dimensional plan of the proposed treatment (Fig.1).



Fig. 1. Pre-operative view; diagnostic cast with proposed gingivectomy; diagnostic cast; provisional restorations made according to diagnostic wax-up.

The benefits of testing or pre-establishing accurate esthetic treatment objectives through a diagnostic wax-up are evident. It establishes the endpoint of clinical treatment for the clinician and demonstrates the final result to the patient. From an execution standpoint, clinical guidelines are provided so the technical requirements of the definitive restoration can be achieved. For example, once the desired contours of the

final restorations are established, the amount of tooth reduction needed for sufficient restorative material space can be determined. The diagnostic wax-up subsequently functions as a guide during framework fabrication so that porcelain can then be applied in adequate thickness, thereby optimizing the esthetic potential of the ceramic material. Operating without treatment guidelines may result in esthetic compromise. An example is the opaque porcelain “headlight” that may exist following insufficient tooth reduction. In this situation, modification to the tooth preparation and a new impression must be made to allow for adequate dimension of alloy and ceramic. Conversely, if there is ample room to accommodate the restorative materials, the technician may use the wax-up information to provide sufficient framework support and to avoid potential porcelain fractures.

Occlusion

While the occlusal morphologic characteristics of a relatively simple restoration (quadrant or segmental restorative dentistry) may not require the use of a diagnostic wax-up, no one will fault the use of a diagnostic wax-up in the fabrication of any multi-unit posterior prosthesis. The use of a diagnostic wax-up will likely increase the precision and predictability of the final restorations by providing information regarding tooth preparation, framework design, and occlusal surface anatomy.

Treatment of compromised occlusion at a comprehensive level in situations involving more extensive or complex restorations, however, will definitely require the use of a diagnostic wax-up developed on precisely mounted casts. The casts must be properly articulated with accurate occlusal records that include a facebow transfer on an appropriately suited articulator. The treatment of posterior bite collapse with significant loss of occlusal vertical dimension exacerbated by occlusal plane deformities such as an exaggerated Curve of Spee and/or a reverse or dual plane of occlusion, represents a situation that requires extensive treatment and should include a diagnostic wax-up as a guide.

Provisional Restorations as Diagnostic Tools

Precise communication between the clinician and technician is achieved through the accurate transfer of various pieces of information. In most instances, a copy of the directly fabricated provisional restoration is a useful and accurate communication tool for the laboratory. This is assuming the provisional restoration has been optimized intra-orally to achieve all the esthetic and functional objectives desired in the definitive restoration. In situations where the esthetic anterior region is involved, the provisional restorations provide a reliable method of evaluating the patient’s acceptance of the restorative outcome. An impression or cast of the provisional restoration will provide the laboratory

technician fabrication guidelines regarding morphologic and anatomic features. Additional communication tools include accurate digital photographs and color mapping diagrams. Patients that present with additional esthetic demands, however, will benefit from the use of a three-dimensional diagnostic wax-up.



CHIEF's
Sight Picture

First, let me say just how glad I am to be here. I am honored to step into this position. I am coming from what I thought was the best job in the Air Force. Now I’m saying that THIS is it the best assignment. I just can’t imagine a better place to be and work. This ADL has so many exciting things going on and is the core of our career field.

Real or perceived? The reason I wanted to write about real or perceived is I too had perceptions about the ADL, some of them may have even been warranted. However, that was then and this is now. We are not the same ADL we were a year ago. In fact, we have made significant progress in the last 6 months. If you were like me and refrained from using the ADL for whatever reason, it is time to reevaluate and give us a try. I know resources are very limited at the local levels and many MTFs have to make difficult decisions. I would offer that we are a viable option for any of your excess workload. Allow me to address two issues: Quality and Timeliness.

Quality: we have had some excellent technicians PCS in this summer coupled with continued emphasis on training. I have personally looked at some of the work and have seen nothing but high-quality prostheses. Let me just add that if you have an issue with ANY case, please put that info on the Quality Control Form. We cannot improve our processes without your timely feedback. Currently, of all the forms we have returned to us, we have a 97% insertion rate and 96% satisfaction rate. If these numbers sound high compared to your experience, I need to hear from you. This data is an all-time high for the ADL, and once again, reason to give us a try.

Timeliness: Yes, we have had some cases in the ADL for too many days. However, through processes we implemented 6 months ago have had a huge impact on turnaround time. We are currently at a reasonable timeframe (15 days). A month ago was the first time we had no cases over 30 days. In fact, cases arriving now are being waxed the same day or the next day. This is a great time to give us a try.

Our return rate on Quality Control (QC) Forms is about 30-40%. Our intuition says that 90% of those dissatisfied don’t voice their concern and each one of

those tells 8-10 people. If you aren't sending back your QC cards, I'd like to hear from you. I would also ask that you send the cards back shortly after insertion, don't stockpile and send all at one time. Sending shortly after insertion is the best way for us to identify any adverse trends that may be occurring. I am also exploring other means to capture this valuable info from the bases.

We are in the process of revamping our ADL Webpage. I'd like to solicit what you'd like to see on our homepage or be able to access. Please email me or [Hilda Guardado](#) with your input. The only reason our website exists is for YOUR use. If we aren't giving you what you want, I need to know. As you can tell, this will be a common theme of mine. You are our customer and I want customer service to be our competitive differential advantage. In our changing healthcare environment, I realize there are options healthcare providers have. I want our ADL to be your choice of labs for your excess workload.

As you may have noticed, there are nine 5-level (SrA & SSgt) vacancies at the ADL. If you have any interest at all, please call me to discuss. I believe this is a great assignment and an opportunity to be part of something exciting, all in one of the most scenic places in the United States (of course I'm still partial to Montana). Check our website for details at <http://www.peterson.af.mil/adl/>.

In summary, we are here only to support your needs. Please let me know if we are not meeting your needs. We have GREAT people here and we are excited to move forward and provide you with the service and quality you expect. I just don't know what that is. Please help us help you. I am committed to this operation and thrive on the challenge of providing you quality service in a timely manner. We have the staff to do great things. I look forward to this great opportunity of serving you in years to come. See you at the workshop.

[Chief Dan Elfring](#) 😊

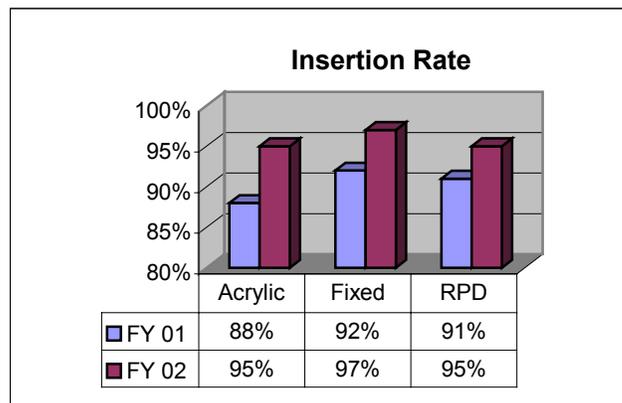
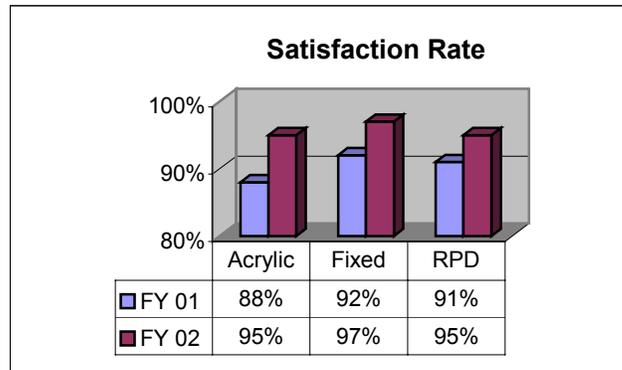
Operations Element

The mission and purpose of the Area Dental Laboratory (ADL) Operational Element is to produce dental prostheses that meet provider's expectations for both quality and timeliness. To this end, the Operations Element is composed of three departments—Quality Control, Fixed and Removable—which are led and managed by three enthusiastic and talented Senior Noncommissioned Officers (SNCOs). The SNCO leaders of each department are MSgt Nancy Kujak, MSgt Judy Bailly and MSgt Anthony Kazlouski respectively. They are the ADL's primary points of contact for specific product questions or concerns. Each has dedicated their skills, knowledge and abilities to improving the quality of the ADL product line ... and it shows in the product quality indicator.

Two quality indicators are used; provider satisfaction and insertion rate. These are shown in the

data summary report, comparing FY 01 data to FY 02. Percentage rates are an aggregate of *all returned* Quality Control Cards for the year shown.

Comparative Quality Control Data FY 01 to FY 02



	<i>Satisfaction Rate</i>	<i>FY 01</i>	<i>FY 02</i>
Acrylic		88%	95%
Fixed		92%	97%
RPD		91%	95%

	<i>Insertion Rate</i>	<i>FY 01</i>	<i>FY 02</i>
Acrylic		94%	97%
Fixed		94%	98%
RPD		95%	98%

The product quality improvements, noted above, are the result of a myriad of activities implemented by our Production Management Team. These actions have also been applied to the product turnaround time of 30 calendar days established, by the ADL Executive Staff.

Since January 2002 the entire operational element has committed its resources to completing and returning *all* products to the provider within 30 calendar days. In the past quarter, Jul-Sep 02, the fixed and removable departments have made notable strides to achieving this goal. In Jul 02, 49 percent of all fixed cases were completed and shipped by the 30th day, by the end of Sep 02, 96 percent were shipped within this window. During this same time Removable Partial Denture framework

fabrication rates were near 100 percent and Acrylic based prosthesis production rates maintained a phenomenal 100 percent--a noteworthy accomplishment. However, continuing these achievements will require a cooperative effort between the ADL and the end-user. This cooperation begins by submitting casework that meets all submission standards outlined in the Peterson ADL Submission Standards, February 2002—available online at <https://www.peterson.af.mil/adl>. The importance of this responsibility cannot be overstated. Incoming casework, which does not meet submission criteria, will result in fabrication delays, rework, and possible return. All of which extends the fabrication process and degrades the Dental Service mission. Specific observations and improvement areas, from each of the department leaders, are listed below, please note them in the spirit intended. If you have any further questions, regarding the Operations Element, please contact [SMSgt Leo Chaney](#) at DSN 834-1621.

ADL Alloy Update

Maryland Bridge Alloy

Two months ago we replaced Rexillium® V with Master-Tec, a white ceramic alloy manufactured by Ivoclar Vivadent, Inc., for all Maryland Bridges. Master-Tec™ does not contain beryllium. The cost of Rexillium® V is \$60 for a 5oz bag and Master-Tec™ is \$83.63 for a 5oz bag. The health and safety of our personnel outweighs the



cost difference of \$23.63. This alloy is invested with a high heat phosphate bonded investment of your choice. We invest our Maryland Bridges with Microstar High Speed Investment. We cast our Maryland's with the Mod 4 induction casting machine from Ticonium. If you would like more detailed information, please call MSgt Mark Schelling at DSN 834-1608 or e-mail him at <mailto:mark.schelling@peterson.af.mil>.

Portadur P2 Type III Alloy

Due to the cost of Type III alloy for the Depot, we have changed our Type III alloy from Firmilay II to Portadur P 2. We purchase Portadur P 2, Part number 012013, from Weiland Dental Systems for \$291.84 an ounce. The price for Firmilay II from the Depot is \$372.10 an ounce. Last FY we used 138.4 ounces of Type III alloy. By purchasing this alloy from the alternate source we saved the Air Force \$11,107.98.

Weiland Dental has a Blanket Purchase Agreement with the Air Force. This will enable you to purchase over \$2,500 from them on one purchase. Their phone

number is 1-866-876-0885. Their web site is www.weiland-dental.com

V-Delta SF Alloy

We also changed our source for our metal-ceramic alloy from the Depot to Metalor® Technologies USA. The alloy we use is V-Delta® SF, part number PTDE02631, and the price is \$328.80 an ounce. The price for this type of alloy from the Depot is \$475 an ounce, a difference of \$146.20 an ounce. Last FY we saved the Air Force \$34,971.04 by purchasing this alloy from Metalor® Technologies USA. They also have a Blanket Purchase Agreement with the Air Force. Their phone number is 1-800-554-5504. Their web site is www.metalor.ch

Support Element

As some of you may know, Air Force Military Personnel Center (AFPC) recently filled some of our vacant positions with oversea returnees. This became necessary because for the past 3-4 years we have been down 13-plus personnel at anytime. Finally, AFPC is making everything possible to bring our manning to current Air Force averages. Unfortunately, this meant that some of the overseas returnees did not necessarily want to be assigned to the Peterson ADL. All those affected have already come in and to the best of my knowledge; they are enjoying themselves in colorful Colorado Springs.

We are always looking for good technicians who are looking for a great assignment. Let me tell you the Peterson Area Dental Laboratory is a great place to work and probably the best place for anyone seeking to become a well-rounded dental laboratory technician. If you are interested in an assignment to the Peterson ADL, contact us at DSN 834-1600 or email SMSgt F.J. Garcia-Bautista. I will provide you with the current requirements for assignment to the Air Force Academy and the Peterson Area Dental Laboratory. You can also contact CMSgt Elfring or MSgt Kujak at the above-mentioned number.

Training Element

Document updates are available at www.e-publishing.af.mil. For the Career Field Education and Training Plan (CFETP) go to Electronic Publications and at the "Short Title Search" type, CFETP. Once there, scroll down and go to page 12. You will find CFETP4Y0X2, Dental Laboratory Specialty dated November 1999 and CFETP4Y0X2C1, Dental Laboratory Specialty (Change 1) dated November 2001. Each can be printed from this site. Change 1 is needed to update the CFETP.

Qualification Training Packages (QTP) are also available at the same web-site. Go to Electronic

Publications, United States Air Force and at “Special Series”, click Air Force Qualification Training Packages, scroll down and you will find each of the four QTPs, dated September 2001.

If you have any questions as to the navigation to these sites, please call [Mr. Donald Meaney](#) at DSN: 834-1607 and I’ll be happy to assist you.

Higher Risk of Bleeding With Subgingival Crown Margins



A recent study by Reitemeier et al identified several factors that can affect gingival health following placement of posterior metal ceramic crowns. The study reviewed 240 patients with 480 metal ceramic crowns that were placed on

premolar and molar teeth in accordance with a standardized tooth preparation and laboratory technique. The patients’ oral hygiene index score was recorded before treatment, and location of crown margins was recorded at baseline. One year after crown placement plaque index and bleeding index scores were recorded for restored and control teeth. The study found that oral hygiene before treatment, plaque formation, and margin placement all affected the gingival health around the crowns. The probability of bleeding was approximately twice as high for subgingival crown margins as for supragingival margins. High gold, low gold, and palladium alloys were randomly used for fabricating the crowns, and the laboratory was required to completely veneer the crowns with ceramic, but leave a 1 mm wide cervical metal collar on the lingual surface. While the probability of plaque accumulation was higher on the lingual surface compared with other surfaces, the alloy used did not influence plaque or bleeding scores.

Source: The Journal of Prosthetic Dentistry, 2002;87:167-72

Quality Control

Cooperative efforts to improve cast work especially indexing procedures will improve the outcome of all submitted casework. Items of particular concern are a good working model with proper use and placement of both long and short pins. The junction between the cast and die base must be clear of any foreign material (i.e. stone dust, stone fragments and glue). Working dies should be properly trimmed with the margins marked and sealed. The solid model, if sent, must be usable and composed of the same die stone as the working model.

Survey crown requests must have an accompanying RPD design cast with tripod marks and the fixed cast must also be tripoded.

Implant case requests must indicate abutment type/design (one-piece {screw-retained} or two-piece {screw-retained custom abutment with cementable crown fabricated over existing structure}). Additionally, indicate if multiple unit implants are designed to be independent or connected.

Die spacer/lube compatibility has been a recent fabrication issue. Some die spacers have dissolved or become “goeey” when coated with the ADL die lube product. Consequently, we request that submitting laboratories do not paint dies with die spacer prior to submitting to the ADL unless they utilize Belle de St. Claire, Cement Spacer Blue. There are three products that are used to die space: die spacer, die hardener, and die setting retardant. All three of these products are available from Kerr Lab, 1717 West Collins Avenue, Orange CA 92867 phone # 1-800-322-6666. The product information, purpose and ordering information for these items are listed below:

1. Cement Spacer Blue (Classic Die Spacer): keep die spacer at least 1mm from margins when applying
Catalog # 013-304
Size: 4 fluid ounces (120 ml)
Price: \$23.11
2. Die hardener: ADL usually paints around margin area
Catalog # 013-309
Size: 4 fluid ounces (120 ml)
Price: \$23.11
3. Die Prep Setting Retardant: use to thin out die spacer and hardener, use only a few drops at a time. Over dilution may alter the die spacer composition causing the spacer to soften when die lube is applied. Directions for thinning are included with the product container.
Catalog # 013-303
Size: 2 fluid ounces (60 ml)
Price: \$7.42

Other die spacers have been melting or breaking down after the die lube is applied and a wax coping is made. The cause is either the die spacer was thinned out too much with a setting retardant, which changed the composition, or the die spacer is not compatible with the two die lubes we use. Each time this occurs, the original die spacer must be removed, the die must be cleaned up, and a new spacer must be applied. This process is taking up valuable time, discolors or may negatively affect the die, and utilizes more materials. Thus, to save time, money and resources we would appreciate your help and support. You may have already seen comments on some of the returned Quality Control cards or may have already been contacted by **MSgt Kujak** about this issue. If you have any further questions, please contact **MSgt Nancy Kujak** at DSN 834-1608 or Comm (719) 556-1608; e-mail nancy.kujak@peterson.af.mil.

Fixed Department

First, all providers and technicians should reference and use the February 2002 ADL submission standards

before submitting any casework. Sending casework that complies with these expectations will improve the ADL's ability to meet quality and timeliness standards. Second, trim the master die and mark the margin. If either is not complete it will delay/add 3-10 days to the fabrication timeline. Third, confirm all abutments and adjacent teeth can be removed individually, this step saves the technician time and reduces the likelihood a die will be damaged or chipped--ensure dies are removable from the cast before shipping. Fourth, provide detailed information on the DD Form 2322 to include: base name, location, laboratory and provider phone number(s) and e-mail address. Providers must indicate design choice, specific fabrication preferences (i.e. apply/do not apply die spacer) and shade on the prescription. All of the concerns listed above will enhance the capabilities and training of all personnel assigned to the fixed prosthesis department, both skilled and semi-skilled, in meeting provider expectations.

Conducting upgrade training that meets the prosthesis fabrication mission and supports our training obligation requires a unique balancing act for our team leaders. Invariably these demands can and do extend the fabrication timeline. Additional variables, which influence our team's ability to produce, are the number of personnel in upgrade training. Currently the fixed department has 8 apprentice level (semi-skilled) technicians who are learning the fine art of waxing, metal finishing, and stacking porcelain. Approximately every 3 months a group of semi-skilled technicians (three-to-four) are rotated to a new team—where they fabricate, with guidance from their trainer, all segments of that group's production responsibilities. During this 12-15 month training rotation, the apprentice technician is exposed to every aspect of basic fixed prosthodontic production procedures. Our team leaders take this heavy training responsibility seriously and with pride. That is why it is so important that we establish a clear communication channel with you, our customer and we start every case off with quality cast-work and clear instructions. Most of our technicians do not have the years and years of experience to just "know" what to do in every case. The ADL has also established a training agreement with the local base dental laboratory where the new technician is sent to the local lab for a 30-day training session where they learn the importance and application of basic cast-work skills. Finally, the semi-skilled tech has a 2-week training session within the ADL Acrylic section—rounding out the required 5-skill-level up grade training requirements. If you have any further questions, please contact [MSgt Judy Bailly](#) at DSN 834-1609.

Removable Department

The most pressing concern to date involves the use and fabrication of Reinforced Acrylic Pontics (RAPs).

Consequently, the RPD department requests all casework submissions requiring RAPs be identified and prepared as follows:



Fig. 2. RPD master cast with stone matrix positioning acrylic resin denture tooth.

First, RAPs should only be used to replace anterior teeth that have a residual ridge that shows only slight to moderate resorption. Additionally, the resorption area should be stable and firm. Second, RAP teeth and adjacent natural teeth must not be excessively rotated, tipped or overlapped. Conversely, the use of RAP teeth should be avoided when:

1. The residual ridge is greatly resorbed, is not firm, or indicates that it will continue to resorb significantly. (Open retention or mesh is better utilized here because it can be relived.)
2. A large number (4 or more) of contiguous teeth must be replaced.
3. Periodontal involvement has resulted in excessively "long" teeth.
4. The teeth are moderately to excessively malpositioned.

We recommend the provider and supporting laboratory complete the following tasks, if the use of a RAP is desired. Begin by grinding the acrylic tooth to fit the edentulous ridge on the master cast and align as per doctor's instructions. Second, cut only the apical surface of the tooth where it contacts the ridge, and adapt the tooth as closely as possible to the ridge. Third, position the RAP tooth on cast using sticky wax in areas other than incisal or facial. Apply a thin coat of Die-Lube (not Die-Sep) to incisal and facial surface of RAP tooth and first natural tooth on each side of the RAP tooth. Fourth, mix a small amount of stone and adapt it to form a RAP matrix. Allow the stone to set completely and then separate it from the cast and RAP tooth and trim the RAP matrix to the following dimensions:

1. Approximately 2mm thick over the incisors of RAP and adjacent teeth. (Stone should include the lingual-incisal line angles of all teeth, but should not extend onto the lingual surfaces of any tooth) (Fig. 2).
2. Extend 2/3 of the way down the facial surfaces of the teeth toward the gingival margin.

3. Horizontally cover the RAP tooth and not less than 3/4 of the width of the facial surface of the first natural tooth on each side of the RAP tooth.

4. The RAP is now ready for shipment to the ADL where personnel in the RPD department will create a box-preparation in the lingual surface of the pontic to accept actual strut that supports the RAP. If you have any further questions, please contact [MSgt Anthony Kazlouski](#) at DSN 834-1614.

What to Consider When Writing a Dental Laboratory Prescription (DD Form 2322)

1. Make sure you complete blocks #'s 1, 4, 5, 6, 7, 8, 9, 10, 12, 13, 26, 27, and 28. (Block # 2 must also be filled in and the entire 2322 typed for sending to the ADL.) This information must be complete. The lab has instructions to return the case to you if at least these blocks are not properly completed. Residents should have the lab officer or prosthodontist review before sending.
2. Let the lab know if you want them to apply die hardener and/or die spacer to your master die. If you want the lab to mount the case, do not apply die spacer, as this will interfere with obtaining an accurate mounting.
3. By default, the pindexed die is the master die, unless you designate another pour as the master die. If you think that the margins are better on another pour or impression, label the *pindex die* as the working die, and label the *single die* as the master die. Write on the 2322 that you have done this.
4. State on the 2322 if you want the lab officer to see the wax-up. It is not automatic that the lab officer will evaluate every wax-up, and it may delay completion of your case typically 1 to 2 days, depending on how many cases need to be reviewed. Best method is to include a **“Go-By Cast”** which is a duplicate cast of a diagnostic wax-up or pre-op cast to guide the technician.
5. For porcelain-fused-to-metal crowns use the cutback design form in the submission standards, or;
 - a) Indicate those **occlusal** contacts to be in metal and those to be in porcelain.
 - b) Indicate those **proximal** contacts to be in metal and those to be in porcelain.
 - c) Indicate what shade of porcelain (should already be in block 13).
 - d) Indicate margin design by either: “all metal margin” or “porcelain labial margin”
6. For fixed partial dentures;
 - a) Indicate pontic design (also on the cutback design form in the submission standards): (e.g. “bullet, modified ridge lap, ovate, Parel/sanitary [man only].”)
 - b) For each FPD retainer, indicate the items in #5.

- c) Indicate connector design (e.g. “make as tall as possible” or “make room for proxy brush”)
7. For surveyed crowns:
 - a) Must have tripod marks on cast prior to submitting case to lab.
 - b) Include an RPD design cast to design the following: Refer to it on 2322.
 - i. Indicate where rests are to be, and type.
 - ii. Indicate where guide planes are to be and how tall (usually only 1-1.5 mm).
 - iii. Indicate where undercuts will be (e.g. MF, DF, etc.)
8. For removable partial dentures:
 - a) Color in teeth to be replaced, “X” out teeth not to be replaced.
 - b) Enter the **Bioblend shade and mold** for denture teeth. Don’t use the Vita Shade guide.
 - c) For **Transitional RPD**: draw design, place tripod marks and survey cast; include wire size for clasps and labial bows.
9. Lastly, ensure that your casts:
 - a) Have either orientation marks or an interocclusal record for articulation.
 - i. Trim record correctly and check for accuracy for accuracy before submitting.
 - b) Have all nodules (bubbles) interfering with occlusion removed.
 - c) Ensure the heels of the casts do not touch (interfere with articulation).

The OSHA Top 3 Dental Laboratory Violations



As a dental laboratory manager, you’re legally bound by standards issued by the Occupational Safety and Health Administration (OSHA) to provide a safe working environment for you and your staff. Therefore, it’s your responsibility to familiarize yourself with all applicable standards set forth by OSHA. Given the scope of the regulations, covering everything from electrical wiring and housekeeping to training employees and preventing contact with infectious materials, this can be a somewhat daunting task. In addition to staying abreast of OSHA regulations, dental laboratory managers who want to ensure they’re in compliance should designate a safety monitor to oversee the safety program and ensure their monitor is properly credentialed through courses and training.

But even those laboratory managers totally committed to health and safety efforts can receive a visit from OSHA. And, because of the number of regulations and the sometimes difficult task of interpreting them, it’s likely that an inspection will turn up at least a few violations. So which regulations trip us up most often?

Listed below are the 3 standards that were cited by Federal OSHA regulations during the period October 2001 through September 2002. The following list includes highlights of the standards only. For full text, visit www.osha.gov/cgi-bin/std/stdser1?esize=0&state=FEFederal&sic=8072

1. Bloodborn Pathogens: The largest number of OSHA violations, across almost every industry, fall into this category. Intended to reduce the incidence of chemically related occupational illnesses and injuries, this standard is also referred to as the “worker right-to-know” standard.



Following are some of its key elements:

a. Hazard Communication Plan. This plan states in writing your methods of complying with the Hazard Communication Standard including your systems for container labeling, maintaining Material Safety Data Sheets (MSDS), conducting staff training, etc.

b. Maintain a File of MSDSs. OSHA requires that you have copies of the MSDS for each hazardous material in your laboratory and that they are accessible to employees at all times. Federal law requires manufacturers and distributors of products containing hazardous substances to furnish customers with MSDSs.

c. Keep an Updated Hazardous Substance Inventory. You must maintain a master inventory list of hazardous materials in the laboratory, including items such as etching acids, disinfectants pickling agents and flux. You can check the MSDS to see whether a chemical is hazardous or not. The name used on the inventory list must match the name used on the MSDS.

d. Labeling Protocol. All containers must be labeled with their contents and any hazard warnings. The name and address of the manufacturer must also be listed. In most cases, the manufacturer, supplier or distributor will already have labeled the container satisfactorily, but it's your responsibility to check for accuracy and completeness and re-label it if necessary.

e. Employing Training Program. The standard The standard requires employee training, including;

- (1) The Hazard Communication standard,
- (2) The components of your written program and where it's located,
- (3) Your lab's labeling system,
- (4) Procedures in hazardous work areas Where exposure to chemicals may occur,
- (5) Emergency procedures,
- (6) The location and meaning of MSDSs.

The training must be provided to all new hires, to employees using a new product that contains hazardous chemicals, and to attendees of an annual refresher course.

2. Hazard Communication: The objective of this standard is to limit occupational exposure to potentially infectious materials that could result in the transmission of disease such as hepatitis B or HIV. In the dental laboratory, it applies to saliva or blood on incoming impressions, models or appliances sent in for repair. Following are some key elements of the standard:

a. Exposure Control Plan. Requires a written plan that identifies tasks, procedures and job positions where exposure to bodily fluids occurs. You must classify staff according to their level of exposure: Category 1 employees have a direct exposure to blood and body fluids and Category 2 employees don't have exposure. The plan must also include standard operating procedures for risk areas, including disinfection procedures for incoming cases. It must be accessible to employees and should be reviewed at least annually, when new procedures are implemented, or when staff positions are revised.

b. Universal Precautions Mandate. You and your staff must practice universal precautions, meaning that you should treat every case that comes through the door as though it is carrying an infectious disease. Although OSHA doesn't set specific disinfection methods for dental laboratories, it does require that you control staff exposure to bloodborne pathogens.

c. Work Practices. Your lab must have hand-washing facilities including single use towels; eyewash stations connected to cold-water only faucets; and personal protective equipment such as gowns and gloves. The standard also prohibits eating, drinking, smoking and applying cosmetics in work areas. As the manager, you're expected to enforce all aspects of the standard. The standard also requires a written schedule and protocol for waste disposal, laundering lab smocks and cleaning of the laboratory, including cleaning contaminated surfaces and equipment. A common violation for dental laboratories is the failure to disinfect plaster traps, pumice, and equipment used for denture repairs.

d. Hepatitis B Vaccination. Because staff exposed to bloodborne pathogens can be at risk of contracting hepatitis B from an infected case, OSHA requires Category 1 staff be provided with vaccinations within 10 days of being hired.

e. Information and Training. Like the Hazard Communication standard, this standard also requires employee training that covers;

- (1) An explanation of the Bloodborne Pathogens standard,

- (2) Bloodborne diseases and their transmission,
- (3) Steps that the laboratory is taking to minimize risk,
- (4) Personal protective equipment,
- (5) Hepatitis B vaccine,
- (6) How to handle emergencies involving blood,
- (7) What to do in case of exposure.

The training must be conducted for all new staff and least annually for all employees.

3. Hand protection: It is your responsibility to recognize hazards in the laboratory and provide personal protective equipment such as gloves, gowns and masks. A common mistake that many laboratories make is not enforcing the use of it. The following standards were cited relating to hand protection.

a. OSHA Standard 1910.138(a) General requirements. Employers shall select and require employees to use appropriate hand protection when employees' hands are exposed to hazards such as those from skin absorption of harmful substances; severe cuts or lacerations; severe abrasions; punctures; chemical burns; thermal burns; and harmful temperature extremes.

b. OSHA Standard 1910.138(b) Selection. Employers shall base the selection of the appropriate hand protection on an evaluation of the performance characteristics of the hand protection relative to the task(s) to be performed, conditions present, duration of use, and the hazards and potential hazards identified.

@ the Bench.

A word from the ADL Flight Commander

Fellow colleagues, thank you for sending us work and for all of the positive comments since my arrival here last year. We've made a lot of changes over the past few months, internally, to try and get a high quality product back out to you in a reasonable amount of time. Our mantra has been for "All hands to be pulling on the same rope in the same direction," to quote General Gardner.

We have reviewed all the manufacturing techniques used in the lab, and have standardized a lot of things to reduce inventory (we don't need five different types of die lube). We have implemented a cutback design and pontic design request sheet in April 2001 (designed by Mr. Donald Meaney), which is included in the new, freshly rewritten ADL Submission Standards. There is a printable version located at our website, <http://www.peterson.af.mil/adl/>. This is intended to save you (and us) time and communicate more exactly your desires, when creating a porcelain-fused-to-metal restoration. It would help us tremendously if you would use this form with any PFM restoration case.

We have reorganized the lab along the guidelines of the OMG, and have created three elements: a Support

Element, headed by SMSgt Garcia-Bautista, a Training Element headed by Mr. Meaney, and a Operations element headed by SMSgt Chaney. SMSgt Garcia-Bautista takes care of the personnel paperwork and oversees the Shipping and Receiving Section. Mr. Meaney keeps all of our training records up to date, and together with MSgt Fisher has developed an outstanding 15-month 5-Level upgrade training program. SMSgt Chaney has all of the production lines under his control: RPD Section, Acrylic Section and the Fixed Section, which includes the areas of wax-up, metal-finishing, metal-ceramic, all-ceramic, and Maryland Bridge.

Most of my day is consumed in correcting problem submissions. I have to tell you, that I feel my role here is to try and correct as many problems as possible so that we can complete the case, and I don't mind doing what I can. I try and call as much as I can, but many times I can't get through for various reasons. If you would write / type in your e-mail address above block 27 or 28 (signature blocks), it would really help me communicate in a more timely fashion. In fact, we are currently revising the 2322 to include a block for your e-mail address.

When there is a problem submission, it typically delays the case five to fourteen days. The problems are usually with the cast work, where dies won't seat, dies aren't cut out or trimmed, and / or porous pours of stone that leave voids in critical places. Line of draw and undercuts are another source to delay your case. Inaccurate impressions where margins, whole teeth, and residual stone nodules on the occlusion create distortions that most of the time cannot be fixed outside of remaking an impression that is accurate. Evaluating and correcting problems, occasionally refusing a submission, and clarifying vague instructions take a lot of time. We try very hard to complete the case you submit within thirty calendar days, and you can help us out by reviewing your case before you send it to us. Please read the new Submission Standards, and correct the deficiencies before sending, and we'll do our best to get it back to you on time. Thank you.

Lt Col Allan D. Linehan, DMD, MS

From the Peterson ADL Training Element

Did you know that the AFSC 4Y0X2 has had a change to the Career Field Education Training Plan (CFETP)? Effective 1 Nov 2001, Change 1 was published and it identifies numerous amendments. Of note is that it deletes the 7-skill level, Craftsman Course and identifies three new Qualification Training Packages (QTPs) necessary for upgrade to 7-skill level. The Change 1 document can be accessed at: <http://afpubs.hq.af.mil>. Go to the search engine at Forms and Publications and type, "CFETP", then follow the prompts.

The revised QTPs, dated September 2001, can also be accessed at: <http://afpubs.hq.af.mil/pubs/specalist.asp?puborg=AF&series=qtp>. The new training modules are in Volume 4 of the QTPs.

Finally, many individuals ask the question of why all the fuss with the CFETP and the Specialty Training Standard (STS) starting at page 29 of the CFETP. Put simply, the CFETP outlines the path of career development, while the STS defines the many tasks 4Y0X2s are expected to perform and to what level of performance. If you'll observe on page 29, Column 3, Training Proficiency Codes, levels of performance are defined for task performance, task knowledge and subject knowledge by using an alpha-numeric code. Those codes are further clarified on page 28 of the CFETP, and provide a clear definition of the knowledge and performance that you, as the trainer or certifier can communicate to the trainee.

What trainee would object to knowing the specific expectations they are to satisfy? And optimistically, what trainee wouldn't exceed those expectations in pursuit of, "Excellence in all we do."

Laboratory Notice for Change in Metal Ceramic Alloy

For cost considerations, Peterson ADL is changing the metal-ceramic alloy we use to fabricate PFM restorations. We are changing from Jelenko Olympia to Metalor V-Delta SF. Please check the QC card to see which alloy was used. Although the alloy is very similar, there is enough difference that Olympia solder is not compatible with the V-Delta SF alloy. If you have to cut and solder a PFM FPD, you must use Metalor's VACU PF solder with V-flux to do the post solder. The source and part numbers are listed below. If you are unable to purchase these items, or they have not arrived yet, you may make a solder index and return the FPD to us to post solder for you. Should you return the FPD for post solder, please include a detailed description explaining exactly what you would have us do. Thank you!

Metalor Dental USA Corp. (800) 554-5504 and www.metalor.com

Item	Item Name	Part No.	Unit	Price
Post Solder	VACU PF	FIRO 9 441	5.0g	\$85.68
Flux	V-Flux	DCV 11 901	20ml	\$12.32

Shipping and Receiving

We strive to deliver high-quality restorations in a timely manner. You can help us achieve this goal by adhering to our submission standards. If you don't already have a copy, let us know and we'll mail you one.

You can also download the submission standards from our website, visit us at <http://www.peterson.af.mil/adl/>

We cannot overemphasize the importance of a properly filled out DD Form 2322, Dental Laboratory Work Authorization. If at all possible, type the form for us. If not, please print legibly. It is very important that you fill in the name of your facility at the top. To conform to proper infection control standards, all items you send us must be properly disinfected and wrapped in a plastic bag.

DOs:

- Always include a copy of DD Form 2322 in each shipping box.
- Ensure DD Form 2322 is filled out completely. Include your facility's name, mailing address, DSN and commercial phone number. If your facility is located overseas, please include a physical address so we can promptly return your case. FedEx requires physical addresses to make deliveries overseas, they will not deliver to Aerial Post Office or Post Office Boxes.

DON'Ts

- Please do not apply packing tape directly onto the shipping boxes; doing this shortens the box's life span.

To check on the status of your laboratory case at the Peterson ADL, log on to <https://www.peterson.af.mil/adl> or contact the ADL's Shipping and Receiving section at DSN 834-1698 or commercial (719) 556-1698

Would You Like to Decrease Case Fabrication Times? Change to FedEx!!

We have noticed that most cases sent to us are via UPS or the U.S. Postal Service. Shipping cases in this manner takes anywhere from 5 to 20 days. This delays patient treatment and increases fabrication times. Each dental laboratory can do their part to ensure patients receive the best and fastest service by checking with their local transportation office to setup a FedEx contract. You will find that your local transportation office may already have a contract with FedEx, and they simply may be able to add the dental laboratory to it. Since the ADL switched to FedEx, we have found it is less expensive, gives us a tracking tool, and are usually guaranteed next day delivery.

Logistics

Metal Case Pans

Metal case pans can be purchased from: W. E. Com, Inc., 20 Warrick Avenue, Glassboro, New Jersey 08028 1-800-628-4115; Fax:856-863-8408

[Email: wecom@wecom.com](mailto:wecom@wecom.com)

Part Number 6520-00-514-2394
 Case Pan, Dental
 Here are some estimated prices:
 10 Case Pans - \$44 each
 50 Case Pans - \$35 each

Shipping Boxes and Inserts

The ADL purchases both the box and the insert from Tharco. If you still purchase the small two-slot box you probably purchase them from the Blind Industries and Services of Maryland and you then purchase the inserts for these boxes from Tharco. I contacted Tharco over a year ago, and they can manufacture both the box and the insert. This makes ordering both items much easier. We found that one case does not fit in one small box, so we researched making a four-slot box.



These are the only boxes we purchase and here is the most current information on them:

Tharco
 13400 East 39th Avenue
 P. O. Box 39103
 Denver, Co 80239-0103
 E-Mail: SALES-DEN@THARCO.COM
 Tel: (800-) 525-1831
 For the four-slot box with insert you need to give them this information:
 8 x 6 x 3-7/8
 275# B Brown
 Roll End Tuck Mailer

We had the company give us prices on different quantities. You save more when you buy in bulk. You might want to just make a once a year purchase and replace all your boxes each year. Here is the price breakdown:

Quantity	Price/Each
10	\$30.82
20	\$16.51
25	\$14.01
30	\$11.79
40	\$9.53
50	\$8.07
75	\$6.13
100	\$6.13
200	\$3.70
250	\$3.40
300	\$3.22
500	\$2.75
750	\$2.27
1000	\$2.10

If you only need inserts, you can order the four-slot insert and separate them for use in the two-slot box. They are connected by thread. The information you need to give the company is:

1 EACH – 8 x 6 x 2-11/16
 1.05# 34IFD White Ether
 This is the slotted portion
 Foam Die Cut Pad

2 EACH – 8 x 6 x 3/4
 1.05# 34 OFD White Ether
 This is the top and bottom pad
 Foam Die Cut Pad

Outstanding ADL Personnel

- Peterson ADL Airman of the Year (2001), *A1C Joshua Miller*
- United States Air Force Dental Airman of the Year (2001) *A1C Joshua Miller*
- Air Force Association Airman of the Year (2001) *A1C Joshua Miller*
- Peterson ADL NCO of the Year (2001), *SSgt Steve Albers*
- Peterson ADL and USAFA Dental SNCO of the Year (2001), *MSgt Nancy Kujak*
- Peterson ADL Civilian of the Year (2001), *Ms. Patricia Murphy*
- 10 MDG and USAFA SNCO of the Quarter Oct-Dec 01, *MSgt Judy Bailly*
- 10 MDG and USAFA Civilian of the Quarter Apr-Jun 02, *Mr. James Davis*
- 10 MDG Civilian of the Quarter Jul-Sep 02, *Ms. Patricia Murphy*

ADL Farewells

- ❖ *CMSgt Michael Bonner* retired June 2002
- ❖ *TSgt Richard Ortiz* retired May 2002
- ❖ *TSgt Ann McKinley* retired August 2002
- ❖ *TSgt Conrad McCloskey* PCS'd to Elmendorf AFB, Alaska
- ❖ *SSgt Jody Hildebrandt* PCS'd to Spangdahlem, England
- ❖ *SSgt Zsanine Martin* PCS'd to Kadena, Japan
- ❖ *SSgt Simon Sharpe* PCS'd to Elmendorf AFB, Alaska
- ❖ *Mr. Richard Rivera* PCS'd to Sembach AB, Germany

ADL Hails

- MSgt Wesley Schlauch Arrived from Nellis AFB, Nevada
- MSgt Robert Czupryna arrived from Hickam AFB, Hawaii

- TSgt Mark Hancock arrived from Kadena AB, Japan
- TSgt Andrew Zimmer arrived from Lakenheath, England
- TSgt Daniel Sierra arrived from Lajes Field, Azores
- SSgt James Swihart arrived from Spangdahlem, Germany
- SSgt Dianna Padilla arrived from Andersen AFB, Guam
- Mr James Coleman arrived from Sembach, Germany

ADL Web Page

We are currently posting submission standards, product lines, turnaround times and case status reports. Twice a week, we update our web page report detailing when we received your cases, what stage of fabrication they are in (wax-up, casting, finishing, etc.) and when they were shipped. The intent is to keep you informed on the progress of your cases and aid in the scheduling of your patients in anticipation of the prosthesis arrival. You can also find copies of the ADL Newsletter and information about the upcoming workshop at <https://www.peterson.af.mil/adl>.

Other ADL Web Page Sites:

Ft. Gordon (US Army), GA, ADL:
<http://www.dencom.army.mil/adl/index1.html>

Kadena AB, Okinawa, Japan ADL:
<https://www.kadena.af.mil/kadena/18wg/18mg/adl/adlhomepage.html>

San Diego (US Navy), CA, ADL:
<http://ndcsd.med.navy.mil/adl01.htm>

Sembach AB, Germany ADL:
<https://wwwmil.usafe.af.mil/bases/Ramstein/86ds/adl/>

ADL Key Personnel

[Col Douglas B. Evans](#)
 Area Dental Laboratory Director
 DSN 834-1603
[Lt Col Allan D. Linehan](#)
 Area Dental Laboratory Flight Commander
 DSN 834-1602
[CMSgt Dan Elfring](#)
 Area Dental Laboratory Manager
 DSN 834-1601
[SMSgt Francisco Garcia-Bautista](#)
 Area Dental Laboratory Superintendent

DSN834-1604
[SMSgt Leo Chaney](#)
 Operations Element Chief
 DSN 834-1621
[MSgt Nancy Kujak](#)
 Support Element Chief
 DSN 834-1606

[Donald T. Meaney](#)
 Training Element Chief
 DSN 834-1607
[MSgt Judy Bailly](#)
 NCOIC, Fixed Department
 DSN 834-1609
[MSgt Anthony Kazlouski](#)
 NCOIC, Removable Department
 DSN 834-1614
[MSgt Peter Santaularia](#)
 All-Ceramic Section Team Leader
 DSN 834-1613
[MSgt Richard Torres](#)
 Acrylic Section Team Leader
 DSN 834-1617
[TSgt Daniel Sierra](#)
 NCOIC, Shipping and Receiving
 DSN 834-1625
[Patricia Murphy](#)
 Logistics Manager
 DSN 834-1619
[Hilda Guardado](#)
 Secretary
 DSN 834-1600



Happy Holidays from the Peterson ADL!

Signed//

DOUGLAS B. EVANS, Col, USAF, DC
 Area Dental Laboratory Director

KADENA AREA DENTAL LABORATORY (ADL)

INFORMATION LETTER

FOR ALL SATELLITE DENTAL LABORATORY FACILITIES IN WESTPAC

13 October 1993

1994 ADL WORKSHOP

We have selected February 1-3 for our 1994 Kadena ADL Workshop. The theme of our program is "Dental Implantology" since we now have the equipment and expertise to begin functioning as an implant center. Hopefully we can provide interesting and valuable Continuing Dental Education on all phases of implant therapy including treatment planning, surgery, implant restoration, and laboratory procedures. Although dental implants comprise a large part of our program, we welcome any interesting lectures, demonstrations or table clinics. Please give me a call at DSN 634-3192 if you wish to participate. At this point the schedule is wide open and it is very easy to accommodate requests. In addition, Major Randall Duncan, the Assistant director of the ADL, has arranged to have all presentations approved for CDT credit. We will soon be mailing registration forms and have more details concerning the program. A large turnout would be great!

CERTIFIED DENTAL TECHNICIANS EXAMINATION

We have been in contact with the National Board for Certification in Dental

Laboratory Technology and have found that we can arrange to give their Comprehensive Written Examination. This is a one hundred question multiple choice test. It requires five

years of laboratory experience if you are a graduate of a military training program, or three years if you have an Associate's degree in Dental Laboratory Science from an accredited school. If the response from the field is adequate, we can administer it through our Base Education Office, possibly in conjunction with the February ADL Workshop. A section of our attached laboratory survey is designated to list interested individuals. This is an excellent opportunity that qualified technicians should not pass up.

1993 ADL SUBMISSION STANDARDS

We have recently revised our ADL Submission Standards for 1993 and have included them as an attachment to our Newsletter. The standards are an excellent reference for information regarding the Kadena ADL. They give comprehensive guidance on case submission requirements and detail services provided. For those of you new to dealing with our laboratory, it would be in your best interest to take the time to read them carefully. It will save you time in the long run.

LABORATORY SURVEYS

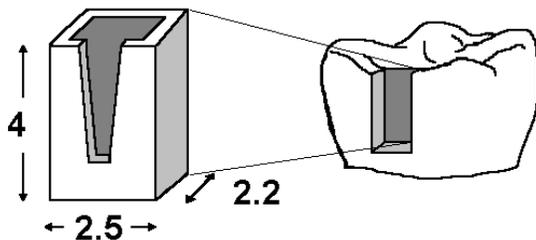
Each year a significant number of personnel come and go here in WESTPAC, causing our telephone index to rapidly become obsolete. Therefore, we are distributing surveys to all of our satellite bases in order to update our directory. Please take a few minutes to list your most current address, telephone numbers and assigned personnel.

ROCATEC SYSTEM

The Kadena ADL now has the capability to chemically bond composite resin to metal using the ROCATEC System by ESPE Premier. This system is used to enhance retention on both precious and non-precious metals to be veneered by Visio-Gem Resin. This is very useful when the metal framework lacks sufficient mechanical retention. Please use the DD Form 2322 to request this service and include a Vita shade for the Visio-Gem material.

FIXED ATTACHMENTS

We can provide semi-precision attachments upon request at the Kadena ADL. We normally use the prefabricated variety such as the Ney Mini-Rest. In order to properly



place these within the confines of the abutment tooth, some type of box

preparation is usually necessary. The attachment is approximately 2.5mm in width. Thus, a box at least 2.5mm wide and 2.2mm deep is required to prevent the attachment from extending over the margins and into the embrasure area. Another other factor to consider is the occluso-gingival height. Most attachments require at least 4mm to provide proper stability.

JOB SURVEYS

Job Surveys have been distributed to the Air Force Laboratories for our technicians to complete. The Job Survey consists of questions concerning training emphasis and performance frequency of over 400 tasks performed in the Dental Laboratory Career Field. It is formulated by the USAF Occupational Measurement Squadron at Randolph AFB, Texas. This information is used to develop the Specialty Training Standard (STS). The STS is the document that outlines all training, including what specifically is to be taught and to what depth at the Apprentice Dental Laboratory Training Course at Sheppard AFB, Texas. The information you provide is what drives training development, thus it is extremely important in providing an accurate assessment of our training needs. It is critical that you take the time to fill them out accurately. Furthermore, there is no right or wrong way to respond to the questions. The Air Force wants YOUR unbiased opinion, not your friend or supervisor's. Quality input is what makes the Job Surveys meaningful and helps the Air Force tailor training to its particular needs.

1 Atch

Area Dental Laboratory Survey

JAMES MCCARTNEY, Col, USAF, DC
Director, Area Dental Laboratory

KADENA AREA DENTAL LABORATORY (ADL)

INFORMATION LETTER

FOR ALL SATELLITE DENTAL LABORATORY FACILITIES IN WESTPAC

4 May 1994

Randy Duncan, along with our new Enlisted Manager of the ADL, SMSgt Charles W. Hixson. SMSgt Hixson recently arrived

HAIL AND FAREWELL

I must apologize for taking so long to write this last Information Letter. Between ADL Workshops, meetings, base wide exercises, and a heavy workload things have been extremely busy at the Kadena ADL.

This will be my last newsletter as Director, for I am leaving this summer for assignment to Peterson AFB, Colorado. I am quite excited about my next job, since I will be working at the brand new ADL scheduled to open on 1 July 1994. I will, however, miss all of the great people I have worked with over the past three years. One could not find a finer group of professionals. Those sentiments also include the practitioners around WESTPAC that I have grown to know. To these people, I give a sincere thank you, and hope to have the pleasure of working with you in the future.

On the upbeat side, quality should be well maintained by my successor, Col Raymond G. Koeppen. Col Koeppen has already been on station at Kadena for one year, functioning as Chief of Prosthodontics. He is very knowledgeable and an excellent communicator who will make a great ADL Director. Remaining on staff is Major

from the ADL at Lowry AFB, Colorado and brings a wealth of laboratory management experience.

SUCCESSFUL ADL WORKSHOP

Our 1994 ADL Workshop was in my opinion, our best ever. It was the largest turnout we've had in three years and the program was superb. I want to thank all who presented and participated in our implant oriented session. Our Workshop provides a high quality and cost effective continuing education opportunity. Those of you looking for future meetings should strongly consider attending .

DICOR UNIT DOWN

A bit of bad news from the ADL is that our Dicor unit is on the blink. Our equipment repair people can't seem to make the Dicor ceramming unit work properly. We have a backup coming in from Travis AFB, California, however, it will take several months to arrive. Therefore, if you need

esthetic jacket crowns, we can substitute Hi-Ceram Porcelain Jackets. For veneers, we can use our new Omega porcelain (more on this later) for a nice result. Give us a phone call if you are interested in a status update.

OMEGA PORCELAIN

Our ceramics department has been using Vita's Omega Porcelain since January 1994 and it will eventually become our primary porcelain material. Omega has a finer particle size than VMK 68 and provides more opalescence to the finished porcelain crown. The only problem we have experienced is that the highly translucent shoulder porcelains appear too grayish. We are currently trying to resolve this problem by mixing more opacious VMK 68 modifiers with the shoulder porcelain. According to the manufacturer, this will not cause any problems.

In addition to the Omega Porcelain, we are also using Vitachrom Delta Stains. These are the newest extrinsic stains designed by Vident and are fine grained, intensely shaded powders which are much easier to apply than the Vitachrom-L stains. The stain is compatible with all Vita porcelains.

EXCESSIVE TURNAROUND TIMES

Due to heavy workload and local factors impacting our manpower, turnaround has been longer than we would like. As things return to normal, we are getting our production times under control. Please bear with us and accept our apologies. Also, feel free to call and check the status of your case. There is always the chance that it has been shipped and we need to locate it in our mailing system.

RUSH CASES

The number of rush requests from our satellite bases appears to be on the rise. Although we try our best to satisfy these requests, please be aware that they can significantly affect our ability to complete our regular cases in a timely manner. PCS moves, separations, or retirements are not sufficient justification for rushing a case unless extenuating circumstances exist. Trying to complete complicated restorative treatment in the last few months may indicate poor planning (often on the patient's behalf). Please submit a written justification along with your case if you require this service. Requests will be considered on a case by case basis.

FINAL IMPRESSIONS

Please send the final impressions along with your pinned master cast. If problems arise, we can pour a second cast and continue the fabrication process. This is especially true in larger fixed and porcelain veneer cases where we are more likely to need a second pour. When providing a solid cast for use in adjusting proximal contacts, please make sure that all margins are exposed so that we can use the cast without significant adjustment.

SHIPPING AND RECEIVING

Since my shipping and receiving NCO's excellent presentation at the Workshop, everyone has done a good job of treating the expensive shipping boxes properly (mainly, wrapping them before putting tape on). However, we still have one problem; we aren't getting enough back. If you have some spares, please ship them back to the

ADL. It will help us get the cases back to you much more quickly.

JAMES MCCARTNEY, Col, USAF, DC
Director, Area Dental Laboratory

Kadena ADL Information Letter

Issue 94-2

23 September 1994

NEW ADL DIRECTOR

Last May, Colonel Jim McCartney left Okinawa for an assignment at the Peterson Air Force Base Area Dental Laboratory in beautiful Colorado Springs. We'll miss him, especially his steadying influence on what can sometimes be a very hectic operation. We wish him continued success and good skiing in his new assignment!

Colonel Ray Koeppen has assumed the position of ADL Director, after one year as Chief of Prosthodontics at Kadena. We hope to maintain a high level of service for our customers because with Major Randy Duncan we still have two board certified prosthodontists on the ADL staff. Kadena is also fortunate to have landed the services of Colonel Bill Neudigate, also a board certified prosthodontist, who is the new Chief of Prosthodontics.

PERSONNEL SHORTAGES



The Kadena ADL has been hard-hit recently due to PCS changes. Last year at this time we had twenty-two (22) enlisted technicians. Currently we have sixteen (16) assigned and will lose five (5) more before replacements begin to arrive in January, 1995. We ask your patience as we work through our staffing shortages and what may be a significant increase in turn-around times. To this end, we have expanded the duties of our secretary, Hideko Taminato to handle disinfection, Shipping and Receiving.

DICOR UNIT IS UP AGAIN

We have received a replacement Dicor unit from the states. In addition to *Dicor®* restorations, we now have the capability of providing *Dicor® Plus* crowns. These consist of a castable ceramic core that is veneered with aluminous porcelain. This allows for more characterization of the restorations - both in color

modifications and surface texture.

The Submission Standards review what is required clinically for all-ceramic preparations. Remember that these restorations require a full 90° shoulder preparation with adequate reduction axially (1.0 to 1.5mm) and occlusally (1.5 to 2.0). These restorations may be stained/glazed at your facility at 940° Celsius for 30 seconds to 1 minute. The manufacturer recommends *Dicor® Light Activated Cement* at insertion. Please feel free to request these materials, if all ceramic restorations are indicated.

MISSING BOXES

In the past few months, we have run short of shipping boxes. From our end, we are not sure if they are being hoarded or if the loss is due to damage which makes them no longer serviceable. If your facility has more boxes than you would use in the next month or two, please send the excess to the ADL. If you need to order more boxes, the case boxes and foam inserts are

government stocked items and should be ordered using DD Form 1348-6. The stock number for boxes is 8115-00-511-5750 (\$1.43 per box). The stock number for inserts is 6520-00-142-8727 (\$45.25 per order of 50). Unfortunately, the ADL supply budget can not fund the sole purchase of boxes for the 47 facilities we support. Thanks.

SHIPPING AND RECEIVING

Please fill in the dates that cases are shipped to and received from the ADL on our Quality Control Records (18 Wing Form 0-113). This is the only way we can track trends (for better or worse) in mail time between you and the ADL. Remember to place your return address and phone

number on the top of the DD Form 2322.

SUBMISSION STANDARDS

Dr. Duncan has been staying up nights and weekends updating the submission standards (Attachment #2) to conform with the latest technical information. Please review them and keep them handy should questions arise.

1995 WORKSHOP

Since we expect our manning level to stay below authorization for several months, the next ADL Workshop will not be held this winter. The time expenditure by our staff is extensive - both in preparation and in hosting the workshop.

We are tentatively planning for the Oct/Nov 1995 time frame for the next workshop. More to come later.

SATELLITE VISITS

We are currently reviewing our TDY schedule and accepting requests for ADL satellite visits. The purpose of these visits is to provide continuing education for the doctors as well as administrative and technical guidance for technicians. Please let us know if you desire consultant support and will do our best to provide this service within the constraints of our budget.

RAYMOND G. KOEPPEN, Col, USAF, DC
Director, Area Dental Laboratory

Attachments

1. Personnel Roster
2. Kadena ADL Submission Standards

List of Personnel

1 Oct 94

Col Raymond G. Koeppen	Director, Area Dental Laboratory
Maj Randall C. Duncan	Deputy Director, Area Dental Laboratory
SMSgt Charles W. Hixson	Superintendent, Area Dental Laboratory
TSgt Nancy A. Ashley	Supervisor, Fixed Department
TSgt (Sel) Robert E. Thomas	Supervisor, Removable Department
SSgt Anthony Campbell	NCOIC, Supply
SSgt Daniel T. Hines	Dental Laboratory Technician (Fixed)
SSgt Daniel P. Jordan	Dental Laboratory Technician (Fixed)
SSgt Thomas P. O'Brien	Dental Laboratory Technician (Fixed)
Sgt Lawrence L. O'Dell	Dental Laboratory Technician (Fixed)
SrA William P. Devine	Dental Laboratory Specialist (Fixed)
SrA Robert Gutierrez	Dental Laboratory Specialist (Removable)
SrA Jason B. Jones	Dental Laboratory Specialist (Fixed)
SrA Dale G. LaChance	Dental Laboratory Specialist (Fixed)
SrA Sharon L. Ratliff	Dental Laboratory Specialist (Removable)
A1C Monica M. Graham	Dental Laboratory Specialist (Fixed)
A1C Rebecca S. Holt	Dental Laboratory Specialist (Fixed)
A1C Rebecca J. Naranen	Dental Laboratory Specialist (Removable)
Mr. James J. Hudson (GS-9)	Civ Fixed Section
Mr. Warren S. Tsunoda (GS-9)	Civ Removable Section
Ms. Hideko Taminato	Secretary

Attachment #1

Kadena ADL Information Letter

Kadena AB, Okinawa, Japan

1 February 1995

1995 ADL WORKSHOP

We would like to invite you to attend our 1995 Workshop at Kadena AB. At this time, we have tentatively scheduled it for 3-5 October 1995. If you are interested in presenting, whether technician or dentist, please contact us now so we can place you in the schedule (POC Maj Duncan 634-3192). This year we will present multiple hands-on participation courses. As last year, the presentations will be approved for CDT credit through the National Board for Certification in Dental Lab Technology (NBCDLT).

The Kadena Education Office will administer the written examination of the NBCDLT during this year's workshop. This is a 100 question multiple choice test. The prerequisite is five years of laboratory experience for a graduate of a military training program, or three years experience if you have an Associates Degree in Dental Laboratory Science from an accredited school. If you are interested, please contact us



soon so we can send you the application. Completed forms must be sent to the NBCDLT along with a \$40.00 registration fee (POC SSgt Thomas 634-1508).

PERSONNEL

The Kadena ADL is in the middle of several assignment changes and presently is staffed with thirteen technicians. Six more are scheduled to arrive in the next two months. This should put us close to full strength. Recently our turnaround times have been excellent, so now is a good time to forward more cases to the ADL.

SHIPPING AND RECEIVING

Believe it or not, we still receive case boxes that are taped closed. Removing the tape rips off the outer layer of the box, drastically reducing its

lifespan. Since the boxes cost about \$8 each and we would like to use them as long as possible, please wrap the boxes in paper prior to shipment to the ADL.

As of 7 October 1994 the ADL has had a new address so be sure to forward your cases to the following:

*18th Dental Squadron/SGDA
Unit 5270
APO AP 96368-5270*

Please do not forget to complete and return our Quality Control Form 0-113. Just a simple checkmark indicating whether or not the case was inserted and how much adjustment was needed will significantly help us evaluate the quality of our work. Of course we appreciate those who take the time to provide us with more specific information regarding the fit, esthetics, function, etc. of the restoration we fabricate for you.

NEW PORCELAIN

SYSTEM

The Ceramics Section has recently received the 3M Vintage™/Opal Porcelain kit and has been fabricating some of our porcelain restorations with this system. 3M Opal Porcelain is an enamel porcelain that is used with Vintage body and opaque porcelains. Many manufacturers are marketing “opal” porcelains claiming that they more closely match natural teeth. The “opal effect” is caused when SiO₂ spheres in the opal stone scatter light in a similar manner as enamel rods in natural teeth. This porcelain fires at temperatures comparable to the Omega porcelain. Vintage can

be corrected with the Vita porcelain and characterized with Vitachrome-L and Delta stains. We have limited experience with this material so please help us in evaluating this system via the QC Form 0-113.

REMINDER

Crown and Bridge procedures demand precision. At times the technicians have difficulty with dies that do not have a definite seat in the stone base. If there is any question concerning a “mobile” die, please send the final (elastomeric) impression or a solid cast.

HAIL

A1C Barry Rowlett	Jan 95
A1C Jennifer Davis	Jan 95

FAREWELL

TSgt Mark Cochrane	Oct 94
A1C Rebecca Naranen	Nov 94
A1C Rebecca Holt	Dec 94
SrA W. Patrick Devine	Jan 95
Sgt Larry O'Dell	Jan 95

Attachment

1. 3M Vintage/Opal Porcelain Firing Chart

RAYMOND G. KOEPPEN, Col, USAF, DC
Chief, Area Dental Laboratory Flight

3M Vintage™/Opal Porcelain

Procedure	Dry-Time	Rate°/min.	Air/Vacuum	Low Temp	HighTemp	Hold Time
Oxidizing	Follow alloy manufacturers temperatures and times.					
1st Opaque	2 min.	55C°/100°F	Vacuum	650°C/1202°F	980°C/1796°F	None
2nd Opaque	3 min.	55C°/100°F	Vacuum	650°C/1202°F	970°C/1778°F	None
1st Margin	5 min.	55C°/100°F	Vacuum	650°C/1202°F	960°C/1760°F	None
2nd Margin	3 min.	55C°/100°F	Vacuum	650°C/1202°F	950°C/1742°F	None
1st Body	5 min.	55C°/100°F	Vacuum	650°C/1202°F	930°C/1706°F	None
2nd Body	3 min.	55C°/100°F	Vacuum	650°C/1202°F	920°C/1688°F	None
Glazing	2 min.	55C°/100°F	Air	650°C/1202°F	930°C/1706°F	None

Note: Actual temperatures may vary depending on porcelain furnace and results desired.

Attachment #1

Kadena Area Dental Laboratory Information Letter

Kadena AB, Okinawa, Japan

1 October 99

ARRIVAL OF NEW LABORATORY OFFICER AT KADENA AREA DENTAL LABORATORY

Greetings from Kadena ADL. My name is Lt Col Steven R. Curtis, and I am replacing Colonel Douglas Evans. My last assignment was Peterson ADL, where I spent one year as a laboratory fellow, and three years as flight commander. My prosthodontic training was completed at Bethesda NNDC as an Air Force member. Colonel Evans is replacing me at Peterson.

Kadena ADL will continue its tradition of providing you with the best prostheses possible. I look forward to working with all of you in the pacific region.



NEW FACILITY AND WORKLOAD

Kadena 18th Medical Group, of which Kadena ADL is a part, recently moved into a wonderful new facility. Part of that move involved downtime where cases were shipped to Peterson ADL. **Kadena is back in operation, and can handle a larger workload.** Please use our services. We offer a full range of prosthodontic fabrication, including Empress all ceramic crowns.

SOLID CASTS AND IMPRESSIONS

Kadena ADL can do a much better job of fixed prosthesis fabrication when a solid cast is included. This cast is used to refine contacts and prosthesis fit. In some cases, it will also be used to refine emergence profiles and esthetics. In my own experience, proper laboratory use of a solid cast saves at least 15 minutes chairtime per unit. Please allow us the opportunity to do our best by sending a solid cast with every case.

Whenever possible, a **satisfactory impression must be included.** Most cases take about 7 days to reach us by mail. If a cast arrives broken, or if casts are damaged in the laboratory, you will loose at least two weeks. A two-week delay on a fixed case can turn an excellent result into a poor one. When the impression is

sent, our technicians can easily recover when there is cast damage.

DEFUALT/SUBMISSION STANDARDS

Attached are new Default and submission standards. Default standards are our fabrication procedures when there is no clear guidance from the doctor. For instance, if there is no instruction on cutback type, and reduction is adequate, we will give full porcelain coverage. If room is inadequate, we will use a cutback design or metal island at our discretion. Pontic defaults are modified ridgelap in the maxillary arch, and in the mandibular arch from tooth number 20-29. Lower molars will be bullet pontics.

Submission standards are what we expect from you. Please note that we require a phone number and address on each 2322. E-mail addresses will also be welcome.

If your clinic does not have the support to produce master casts, please contact me. We will work with you. steven.curtis@kadena.af.mil DSN: 630-4247

KADENA ADL WORKSHOP 2000

Our workshop this year will be held at our new facility 9, 10 February 2000. There will be a variety of hands-on laboratory programs, laboratory lectures, and clinical lectures available. Dr. Curtis is still soliciting for lecture, hands-on, and table clinic presentations. **If you have a topic you would like to present, please contact him as above.** Also, please take the time to fill out the attached form to let us know how many members from your facility will be attending. Remember, if you are a presenter, it can be easier to obtain funding for your continuing education.

In addition to the scientific schedule, there will be optional recreational activities. Please let us know what would be most appreciated.

TECHNICAL REQUESTS/ RECOMMENDATIONS

RPD SECTION: Please revive the tradition of making occlusion relationships with vertical red lines. This is easier to use than bit registration.

FPD SECTION: Please remove solid casts from impressions.

Kadena Dental Laboratory

Key Personnel

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(T)Sgt Deborah Frakes, NCOIC, Acrylic Resin

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Mr. Warren Tsunoda, RPD Civilian Supervisor

DSN 630-4296

Ms. Hideko Taminato, Secretary

DSN 630-4192 hideko.taminato@kadena.af.mil

//Signed//

STEVEN R CURTIS Lt. Col., USAF, DC

Flight Commander, Dental Laboratory

18 DS, Kadena AB, Okinawa, Japan

Kadena Area Dental Laboratory

Information Letter

Kadena AB, Okinawa, Japan

November 2000

3-D SHADE GUIDE

As promised, Kadena ADL has 3-D porcelain. The Vita classic shades have been used for many years. However, objective examination reveals three severe problems. 1. Some tooth shades are not represented by the guide. 2. The guide has some shades that are "not found in nature." 3. The shades are not arranged systematically. For these reasons Kadena ADL added Vita 3-D shades. Each base will be sent a 3-D shade guide by Vita. In order to get maximum benefit, you must use the new guide.

Originally, my intent was to make a complete break from the old Vita guides. However, the logistics of providing all dentists and laboratories new guides and the training to use them is impractical. Instead, we will have a trial period of about one year. If the 3-D shades are indeed better, we will transition to them. Look for updates in newsletters. Please budget to buy a few extra guides for your clinic. **(Vitapan 3 D Master Starter Kit Order Number GX69-902 \$68.00 Includes Shade Guide, CD ROM, Forms, Laminated Instructions, and Video. Phone Number 800-828-3839)**

The new guide has these strengths.

1. It is arranged by value, hue and chroma. The most common shades are in the middle of the guide.
2. Shade spacing is even and systematic. Mixing shades produces a predictable result.
3. Unlike the old guide, all the shades on the new guide should be encountered in nature.
4. The new guide has bleaching shades lighter than B-1

EMPRESS TWO AVAILABLE

Empress two, suitable for anterior 3 unit FPDs, is finally available. Reduction parameters are similar to PFM FPDs except lingual contact areas must have 1 mm reduction. **Futhermore, connector areas between pontic and abutment require 4mm X 4mm. This requirement severely limits application of Empress Two for FPDs.** Good general guidelines are to avoid Empress Two FPDs except for exceptional cases. Shorter than average teeth, or dentitions with greater than average horizontal overlap will require a conventional metal framework.

OLYMPIA METAL FOR RBFDP

Kadena ADL is using Olympia for resin bonded FPDs. **Be certain to tinplate these before cementation.** Olympia casts better and is easier to work, affording less remakes and better fits. Furthermore, non-precious alloys contain beryllium and we've been forced to use special procedures when handling them. Non-precious alloys can be obtained by special request.

TURN-AROUND TIMES

Kadena ADL has experienced a large surge of work. Although we will always strive to meet 14-day turn around times, we can become overwhelmed.

During these times I will always give several weeks warning by E-mail.

It is predictably busy in early November. Normally, this continues until the New Year, with a slower period in January and February. Workload generally picks up in March, and then becomes very heavy April through June. Summers often have moderate workloads, and early fall can be slow. We will always support rush cases for PCS and TDY (TAD). Please avoid these as much as possible.

BITE REGISTRATIONS

Adequate bite registrations continue to be a problem. Whichever technique you decide to use, trim the registration, and be certain that natural teeth line up and touch wear facets with the registration in place. (see ADL Information Letter Feb 00)

SHIPPING AND RECEIVING

DD Form 2322:

- Three copies required for expenditure of precious metals
- Two copies required for expenditure of non-precious metals
- Complete all applicable portions of form:
Name, Address, ZIP Code, DSN number)

Packing/Shipping:

- Place only 2 casts in each box
- Pack all case boxes together
- Write patient's name in waterproof ink on heel of cast
- Place tape only on wrapping paper (not on box)
- **Enclose each cast in plastic bag prior to packing**

REQUESTS IN ITEM #13 ON THE 2322

Our Shipping and Receiving Clerks do not necessarily have prosthodontic background. When a large variety of nomenclature is used in item 13, it creates confusion. Please try to limit nomenclature in Item #13 to the following:

FIXED PROSTHODONTICS:

1. Gold Crown
2. PFM Crown
3. Gold FPD
4. PFM FPD
5. Post Core
6. Empress Veneer/Crown
7. RBFPD

REMOVABLE PROSTHODONTICS:

1. Maxillary Framework
2. Mandibular Framework

ACRYLIC RESIN

1. Night Guard
2. Treatment Partial
3. Process Acrylic
4. RPD/Denture Set Up
5. Base Plate and Rims
6. Hawley
7. Spring Aligner
8. Etc.(Many more appliances made at Kadena)

MISCELLANEOUS

1. Please do not use super glue on RBFPD casts; it interferes with our Duralay fabrication technique. Super glue to protect other master dies is encouraged.
2. Use Bioform (not Vita) shades for acrylic teeth.
3. Please do not use plaster for any cast work, including bases for master casts. It does not hold up well enough, and causes bubbling when acrylic is processed against it.
4. For master casts, "J" pins are inferior to two pin systems. Use two pin systems whenever possible.

Kadena Dental Laboratory
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Ms. Hideko Taminato, Secretary
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//Signed//

STEVEN R. CURTIS, Col, USAF, DC
Area Dental Laboratory Flight Commander
18th Dental Squadron, Kadena AB, Okinawa, Japan

Kadena Area Dental Laboratory

Information Letter

Kadena AB, Okinawa, Japan

March 2001

WORKLOAD

Between December 00 and March 01 Kadena ADL experienced unprecedented volumes of case submissions. This combined with liberal leave and 6 weeks of exercise have put us very far behind. Be assured that we are doing our best to turn around your cases in reasonable amounts of time. We are also transshipping when other bases can complete your case more quickly than we can. You will receive a message if your case is transhipped. We have used Lackland and Offutt laboratories.

As always, we will always support rush cases for deployment or permanent change of station.



ESTHETIC CLASPING FOR RPD FRAMEWORKS

Replacement of anterior teeth is a rewarding area of prosthodontics. When teeth # 7-10 or 6-11 are missing, fixed partial denture replacement may not be predictable. RPDs offer a reliable and esthetic alternative.

Furthermore, there is satisfaction in making a huge difference in your patient's life by supplying them with a prosthesis that allows reasonable function and normal esthetics.

Retentive claspings for Kennedy class 4 RPDs can nearly always be hidden. Following are opinions on claspings.

3-D SHADE GUIDE

About 25 percent of our customers are regularly using the 3-D porcelain shades. This system is an improvement, and I urge everyone to try it. Furthermore, if we continue to have success, Kadena ADL will phase out Vita Classic shades over 01 and 02. Please budget to buy the new guides for your clinic. Finally, we have a few more guides available for clinics that did not receive one from Vita.

EMPRESS

Empress is a wonderful material that we use frequently. However, we sometimes experience problems with delayed cracking that only occurs with the layering technique. At times we may be forced to use staining technique rather than layering. You may occasionally notice this change. Be assured also that we are doing everything possible to sort out the problems with the system.

SHIPPING & RECEIVING

- Send your cases in the brown shipping/receiving box.
- Put patients last name on the heel of the cast with a permanent marker.
- Remove the carbon paper from the DD Form 2322 before sending.
- If you have any questions on your case please call Dr. Curtis at DSN 630-4247 or shipping and Receiving directly at DSN 630-4380.

Conventional 'C' claspings should always be your first alternative. This is not a common option for partial dentures replacing anterior teeth, but it might work well when first molars are missing in addition to # 7-10. In this case one can clasp second molars and second bicuspid through the edentulous space.

If conventional claspings will not work, the next choice should be a **dual path RPD**. Requirements for a dual path partial denture include mesial undercuts on # 6 and 11 without an excessively flat arch, and DF undercuts on right and left first or second molars. MF undercuts are not recommended since these are partly lost as the partial rotates to place. (Diagram 1) Furthermore, we will normally use 020 undercuts for the active retainers because dual path RPDs often have only cross arch reciprocation from active retainer to active retainer. If the height of contour to the depth of undercut varies from side to side, the partial denture can shift as it rotates to place, losing some or all of the retention. (Diagram 2) Consider using composite to accentuate undercuts.

Dual path RPDs have these requirements.

1. They should drop away from as many teeth as possible. Ideally, only the teeth serving as active and passive retainers are contacted. Excessively steep palatal walls are a relative contraindication to a dual path RPD.
2. Rests on passive retainers should be especially positive because they must serve as reciprocation. Try

for a 1-mm facial wall on cingulum rests. This usually necessitates composite addition.

3. Posterior quadrants must be reasonably intact. A definite contraindication to dual path partial dentures is a missing first bicuspid. In this case twin flex can be used.

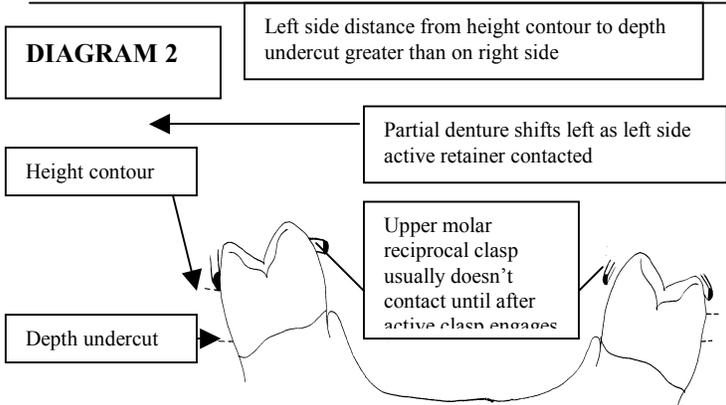
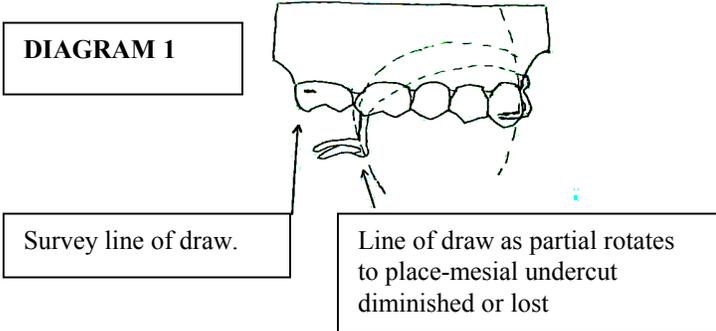
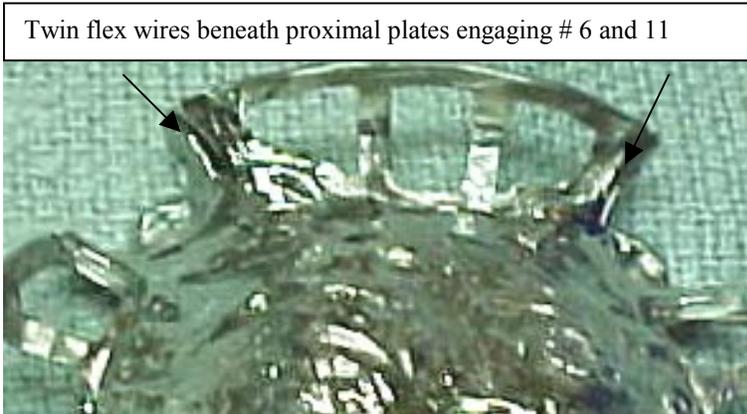
Twin flex is a more complicated laboratory procedure, consisting of a wrought wire soldered to place beneath a proximal plate, engaging an undercut. This should be a third choice when conventional clasping will not work, and too many posterior teeth are missing for a dual path partial denture. .

Aside from being a complex laboratory procedure, twin flex easily clog with debris. Since TF is located at the tooth gingival junction there is potential to worsen periodontal health.

Twin flex has these requirements:

1. Proximal undercuts on abutment teeth. These should not be located too far facial.
2. Positive rests on the abutment teeth. These must also serve as reciprocation. This requirement is not as severe as for a dual path RPD.
3. 3mm vertical and horizontal space. Twin flex can be difficult to hide, and may be contraindicated by insufficient interocclusal room, or a small edentulous space. There is usually insufficient room for twin flex in a single tooth edentulous area when a reinforced acrylic pontic is also prescribed.

Finally, **precision attachments** should be avoided.



NEW ADL NCOIC

Kadena ADL has two new Master Sergeants reporting from Peterson ADL. Elisha Cumbie and her husband Michael arrived 3 March and will have taken their places at Kadena. Elisha will be Kadena ADL's new NCOIC.

WORKSHOP 01

We are planning our annual area dental laboratory workshop for the first week of October 01. Tentatively, there will be a day of clinical program, and two days of laboratory instruction. More to follow.

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//Signed//

STEVEN R. CURTIS, Col, USAF, DC

Area Dental Laboratory Flight Commander

18th Dental Squadron, Kadena AB, Okinawa, Japan

Kadena Area Dental Laboratory Information Letter

Kadena AB, Okinawa, Japan

July 2001

ADL WORKSHOP 2001

Kadena Area Dental Laboratory will host its annual workshop October 3rd and 4th 2001. Based on feedback and observation, the workshop format will be different this year. Following are observations about the workshop and Okinawan military dentistry.

1. Kadena ADL has more business than it can handle, and the workshop exacerbates production problems. However, September and October are reliably less busy than other times of the year.
2. Over 90% of previous workshop attendees were dentists and technicians living on Okinawa.
3. Most dentists only come for one day because Okinawan clinics cannot afford to close down for two or three days during the workshop.
4. There is a wide variety of continuing education opportunities available for DoD dentists. When possible, most dentists prefer to travel to the continental United States for education. Continuing education opportunities for technicians are more limited.

Based upon these observations, Kadena ADL workshop 2001 will be the following:

1. The workshop will be shortened from three days to two days. 18 hours of continuing education were necessary to attract off island attendees.
2. The workshop will emphasize continuing education for technicians. Productivity training corporation, Vident, and Ivoclar Empress have agreed to send master technicians to provide lectures and hands on courses. Two days of education emphasizing laboratory prosthodontics will be available.
3. Two days of clinical prosthodontic lectures will be available. One day will emphasize removable prosthodontics and the other day fixed prosthodontics. This will run concurrently with the laboratory program.

I will also take this opportunity to solicit help with the workshop. If you are a technician or doctor with a technique or lecture you would like to share, please contact me at 630-4247, or steven.curtis@kadena.af.mil

3-D SHADE GUIDE

Three D shade guides continue to make headway. The system is not a cure-all, but it is an improvement. Please budget to buy the new guides for your clinic.

KADENA ADL WILL GROW

In recent years, Kadena ADL has increased productivity by over 50%. Air Force ADLs are retrospectively manned based upon production standard. Because of increased productivity, Kadena will receive 4-5 new technicians this fall. We look forward to the opportunity to serve you better.

Projected to arrive in August 2001:
(T)Sgt Thomas Stiles from Travis AFB, CA
SSgt Llyod Bausa from Peterson AFB, CO
SSgt Michael Arms from Nellis AFB, NV

Departure:
SSgt Noel Sinclair to Kadena Base Dental Lab.

VISIT US

We are proud of our facility and staff. Doctors and technicians are always welcome to visit. Call Dr Curtis at 630-4264,4247 or Elisha Cumbie at 630-4383 to arrange times.

WEB SITE

The Kadena ADL web page has been revamped. It is in a new format that displays the current status of the cases as well as the current average turn around times.

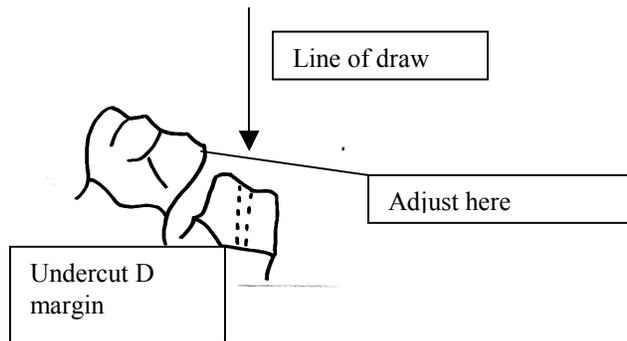
[Area Dental Lab Homepage](#)

POSTERIOR MANDIBULAR FIXED PARTIAL DENTURES

Replacement of posterior mandibular teeth is challenging. Furthermore, my anecdotal experience indicates they fail more often than other fixed partial dentures. Two recurring problems that occur often are undercutting the distal margin of the posterior abutment

by a tooth posterior, and preparation problems with tipped mandibular molars.

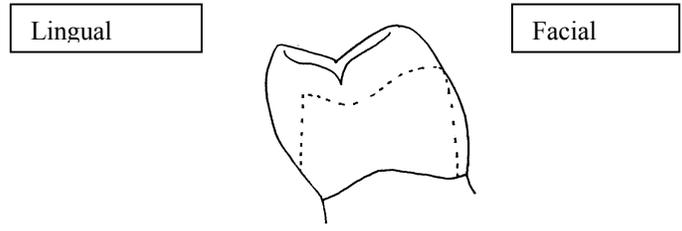
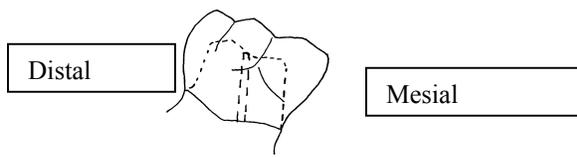
Usually, when a lower second bicuspid or a lower first molar is lost, the teeth posterior to the space drift forward. Dentists are well acquainted with the problem of mesial undercuts on drifted molar abutments, and compensate with heavy preparation. However, most dentists, myself included, often miss the undercut created by the tooth posterior to the distal abutment. This tooth often undercuts the distal margin, necessitating adjustments in the laboratory, and adjustments at the insertion appointment. It is best to recognize the problem at the preparation appointment, and adjust the mesial surface of the distal tooth prior to making the final impression.



The second problem is over-tapering of tipped lower molars leading to poor retention and resistance form. Many dentists over-taper preparations in attempts to solve problems with drifting and undercuts. However, this sets up your FPD for future failure, and fabrication is complicated because neither the wax pattern, nor the metal framework will seat or adapt well to the stone die, (they roll) and a poor product results. A good prep on a tipped lower molar will create opposing walls with ideal taper and include the following

1. Heavy facial gingival and distal gingival prep with light facial incisal and distal incisal prep-use shoulder margin.
2. Heavy lingual incisal and mesial incisal prep with light lingual gingival and mesial gingival prep- feather margin
3. Large grooves facial and lingual-prep with 169 or 170 and enlarged to bigger than a 558 size. I always use grooves on tipped lower molars.
4. Preserve as much incisal length as possible-use full metal.

Drifted lower molar abutment prep schematic



Finally, be conservative. **If you doubt the viability of fixed partial denture placement, don't let the patient convince you to make it.**

**Kadena Dental Laboratory
Key Personnel**

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Kadena Area Dental Laboratory

Information Letter

Kadena AB, Okinawa, Japan

May 2002

TURN-AROUND TIMES

Work orders have increased, but do not expect the extremely long delays that have occurred during other years. As always, rush cases for PCS, TDY, and deployment will be supported.

PTC TRAINING

Kadena ADL may purchase the PTC (productivity training corporation) program this year. A huge commitment will be required from our staff, but we believe PTC will help produce a better product in less time. Stay tuned.



VENEERS

Porcelain veneer work orders continue to increase. These restorations are technique sensitive, requiring high levels of skill and precise planning for optimal results. This newsletter is dedicated to clinical veneer techniques.

THE CONSULT APPOINTMENT

Good technique starts with a good consult. Two points must be explained thoroughly to patients.

1. Esthetic dentistry is not oral health neutral. Purely esthetic dentistry, or veneers done only for esthetics, will decrease oral health.
2. Esthetic dentistry will always make the teeth look different. Whether they look better is up to the patient. Therefore, patients must know what their final restoration will look like before you start. Show this with a diagnostic wax-up and shade guide, or fancy computer program. Use a second consult with casts/diagnostic wax-up and red ink to show the patient where you must cut, and how it is possible to restore the teeth, given root form, emergence profiles, occlusion, etc.

VENEER PREPARATION

Veneer preparation must be planned. Generally, a .5-.75 mm prep with a medium to heavy chamfer and a butted lingual margin removing about .75 mm incisal is best. Make interproximal extensions far enough to hide margins. It is always best to confine the preparation to enamel. There is good anecdotal evidence that dentin

bonds start to fail 4-8 years post-op, and this can cause veneer failure.

With very thick incisors, one can place the incisal margin within the edge, or make a lingual wall. Cuspids and bicuspid may be best treated with a short lingual wall. Remove at least 0.5 mm tooth structure for the lingual wall, and take extreme care to assure it is not undercut in relation to the facial, especially interproximal extensions.

Best all purpose veneer preparation. "Butted" lingual margin, heavy chamfer margin.

Thick incisor edge. It is possible to end margin in the middle of incisal edge

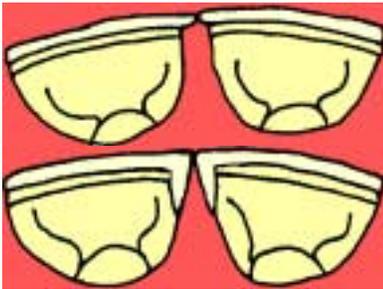
Lingual wall prepared. Avoid this prep for incisors; best for cuspids and bicuspid. Take extreme care to assure the lingual wall is in the line of draw of the rest of the preparation.

As a prosthodontist, I replace many failing veneers. The most common reason for replacement is a fractured lingual wall. In a number of papers, Magnus Pascal asserts there is stress concentration in the lingual concavity of incisors, and that it is important to place the lingual margin incisal or gingival to this area. After 7 years in ADLs, I am convinced this area fractures because some schools teach doctors to prepare lingual walls on all teeth, regardless of available room. We often receive preparations where less than 0.2 mm tooth structure has been removed to create a lingual wall. It is likely that many of these fracture during final adjustment and finishing, or shortly afterward.

Veneers prepped with the margin ending within the incisal edge can be very difficult to fabricate, seat and cement properly. Placing an elliptical dimple mid-facial simplifies this somewhat. Fabrication of this type veneer is a bit easier with a PLV (porcelain/refractory cast) technique. Kadena ADL has chosen not to offer this restoration, but this may change.

DIASTEMA CLOSURE

Closing diastemas with veneers requires a special preparation. To avoid dog-eared interproximals, the preparation must be continued to the lingual line angles. (See diagrams) Furthermore, proximal extensions must have a line of draw, and this usually must be toward the incisal. It is very easy to create undercuts on the lingual prep margins. Veneers with a facial line of draw are possible, but this is much more difficult and should probably be avoided unless the tooth is extremely bulbous.



Improper prep with resultant dog-ears to close diastemas

Correct prep for diastema closure



Lingual view of prep for diastema closure. Note that lingual wall has incisal line of draw. This area is often undercut

CASTS FOR VENEERS

Kadena ADL uses Empress for its veneers. Empress is a stronger material than porcelain, and is also a lost wax technique. **ALL VENEER CASTS MUST BE SECTIONED AND TRIMMED.** When interproximal spaces are not prepped, the cast must be cut from the base, and then fractured through the contact. If the impression is clear and accurate, the fracture will nearly always follow the line between your preparations, yielding an accurate cast. If there are bubbles or distortions in this area the cast may not fracture properly.

VENEER CEMENTATION

Many assert that cementation and finishing is the critical step for veneers. It is usually the longest appointment. General guidelines follow:

1. Do not cement more than one veneer at a time. Proper seating and orientation of multiple veneers is too difficult.
2. All margins must be completely isolated and dry. Occasionally, existing veneers are intact, but discolored with leakage. Contamination of bonding may have occurred in these cases. When necessary, use retraction cord to isolate. Anesthetic is usually necessary for cementation.

3. Use dual cure cement. Whatever cement chosen should have a semi-set stage that allows easy clean up.
4. Adjacent teeth must be well isolated during cementation. It is critical not to contaminate your other preparations with resin or composite. Use the veneer itself, and plastic strips to isolate.
5. Take extreme care not to traumatize tissue during cementation. On large cases, there will be multiple cementations. If bleeding starts after the first cementation, isolation for subsequent cementations can become very difficult. Excellent hygiene around provisionals is critical.
6. I find it more convenient and accurate to adjust occlusion after cementation. A fine diamond works well.
7. When adjustment is complete, finish margins and adjusted areas. Depending upon laboratory accuracy, facial and interproximal margins may or may not need finishing. However, it is my experience that margins exposed to centric or excursive occlusion must be finished precisely. Therefore, I assure there is no discrepancy between tooth and restoration on the lingual margin. I use a Brassler gray wheel, followed by a Brassler diamond wheel.

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Information Letter

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July 2002

EMPRESS ONE AND TWO

Kadena has both Empress systems available. Empress one is a Lucite reinforced pressed ceramic with a good 12-year record. Empress two is another pressed ceramic for short span anterior FPDs. Both are wonderful materials, but both must be used properly for long-term success. This newsletter will define Empress use requirements.

TREATMENT PLANNING

Recently, I spent an evening with a throw away magazine dedicated to all-ceramic restorations. Within were beautiful pictures of teeth in every quadrant restored with crowns, FPDs, veneers and inlays.

The magazine implied that any tooth or space could be acceptably restored with all-ceramics.

This is not true. Manufacturers have strict materials thickness requirements. In some areas you may easily obtain necessary space, while in others dental mutilations may provide barely adequate space. Finally, sometimes adequate materials thickness is not achievable without surgery or other invasive procedures.

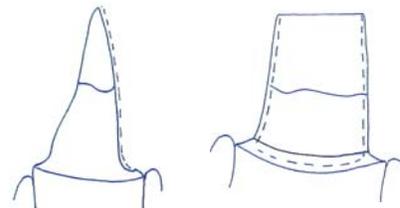
Choose all-ceramic cases carefully, ensuring the laboratory has a margin of error in providing adequate material thickness. It is essential to communicate well with your patient, being ready to tell him that all-ceramic is not possible, and metal must show if he wants his teeth restored. Remember, the best restorations, done by the best dentists, sometimes fail. Do not add non-adherence to manufacturer's recommendations as a reason your restoration might fail.

Dr. Malament of New York has placed over 1500 Empress one and Inceram restorations. His data allows conclusions: Used properly in the anterior, expect an Empress one material failure rate of about 3% over 10 years. Used on Bicuspid, expect a slightly higher failure rate. Used on molars, especially mandibular, expect unacceptable failure rates.

All-ceramic crowns are a huge improvement over PFMs for esthetic corridors. For teeth # 6-11, use Empress one unless 1mm material thickness in the contact area is not achievable. Some Class 2 Division 2 occlusions are unsuitable for Empress. Empress is best avoided for posterior teeth with the exception of some bicusids in patients with high esthetic demands. Empress is normally contraindicated for molars.



Empress can be used effectively over cast posts and stained roots. My technique is to do all fabrications conventionally. Use gold rather than silver metal for the core since this more closely mimics the pulp. Finally, if the shade is A-2 or lighter, cut an approximate 200 μ m box out of the facial of the post or discolored root immediately before cementation. Use an opaquing cement of about the same value as the crown shade. This technique has worked very well for bleaching shades covering very dark roots. Very translucent crowns will appear a little less vital because of the opaque cement.



Approximate 200 μ m box prepared on facial of post and stained root. Limit this prep to the facial of the post and stained root, and do not go closer than 0.5 mm to the margin.

Veneers, full coverage restorations, and natural teeth in the same sextant can be very esthetic. In these cases it is best to give us a stump shade-the preparation's shade. The veneer and crown will generally be fabricated with a stain technique rather than layered technique.

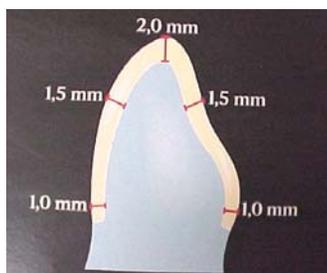
Ceramic inlays and onlays are popular restorations in civilian practice. These restorations cost much more than amalgam, and fail more often. They are also inferior to and more expensive than gold. You have an obligation to explain this thoroughly to your patient, and to use these restorations rarely, if ever. Composite restoration of the mesial of upper first bicuspid should be considered before ceramic inlays.

Empress 2 is for three unit anterior FPDs when adequate material space and connectors of at least 4mm by 4mm are achievable. Empress 2 for FPDs does not have the track record of Empress 1. Therefore, always warn patients about the possibility of early and late failure, and present metal-ceramic restorations as a stronger option. Do not prescribe Empress two for FPDs more than 3 units, or for areas other than 6-11 and 22-27. Be conservative in your recommendations with this material until it is time proven. **Remember, by necessity and default, you and your patient are performing the**

long term in vivo studies when you prescribe any new material.

PREPARATION

Empress demands a precise technique. For crowns, remove approximately 1 mm on axial walls and 1.5-2.0 mm incisal. **For anterior teeth, assure materials thickness in the contact area will be at least 1 mm by removing about 1.25 mm tooth structure.** (Bicuspid should have 1.5-2.0mm materials in contact areas.) Note that on the following guide provided by Ivoclar, 1.5 mm of reduction in the contact area is recommended. Anecdotal data reflecting 10 years experience with Empress for anterior teeth indicates 1.0 mm material thickness in the contact area is sufficient. A private practice in Colorado Springs that commonly made their restorations thinner in contact areas had increased failure rates.



Ivoclar reduction guide



Assure there is room for 4mmX4mm connectors in Empress 2 FPDs

Like any ceramic, Empress does not handle knife-edge margins well. Shoulder margins are preferred, although heavy chamfers are also acceptable. If you are forced to use a feather margin, know that the emergence profile in this area will probably be steep. Good refinement of the body of the prep, and clean impressions are also necessary. Sharp prep areas, and little pulls and distortions in the impression may have a more deleterious effect than with PFMs.

For veneers, a slightly heavy prep is preferable. Empress can be reliably pressed to 0.7 or 0.8 mm. Fabrication of thinner veneers requires thinning of the core material after pressing. (See newsletter May 02 for more information on veneer preps) Very few veneers allow for the layering technique. Kadena uses lightly shades cores with staining for a very esthetic result.

CASTS FOR EMPRESS

Empress is a lost wax technique. Therefore, casts must be pinned and sectioned for all restorations-crowns, veneers, inlays and FPDs. Do not die space since Empress requires a thick spacer peculiar to the system

CEMENTATION

Ivoclar originally recommended conventional cements. However, research indicates that most material failure in Empress is from propagation of a ceramic flaw in the

intaglio. Resin cement can increase the lifespan of restorations because the resin flows into these flaws.

Empress markets Variolink cement. This is dual cure, and works very well for most applications. Most Empress restorations are fairly opaque, and different value/shade cements do not greatly affect the final result. However, as mentioned previously, when cementing light shades over dark roots or metal posts, opaque cement is necessary. Opaque Panavia is conveniently available in many clinics.

CUSTOM STAINING

Empress is difficult to custom stain. If you are in Okinawa, your best option may be to request custom staining at Kadena ADL. When the tooth's shade resembles a shade tab, this is not necessary. However, for single central incisor restorations not matching a tab, custom staining is your best option. Contact Dr. Curtis at steven.curtis@kadena.af.mil.

SHIPPING AND RECEIVING

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Information Letter

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January

2003

TIMELINESS

Kadena ADL has had quick turn-around times for several months. If you decide to make due dates, shipping from your facility to ours can take anywhere from 4 days to 31 days. Please look into reliable shipping to send your cases to Kadena ADL. We pay DHL about \$25 per parcel to ship your completed cases back.

EMPRESS AND OTHER ALL CERAMICS

Empress has recommended 1.5 mm minimum reduction and material thickness in the lingual contact areas. Empress recently changed its recommendations based upon research by Dr. Malament in New York. Dr. Malament has data from about 3500 restorations placed over the past 12 years from which the following assertions can be made.

1. Anterior Empress crowns can safely be cemented with 0.5 mm material thickness in the lingual contact area. Kadena ADL will fabricate crowns at 0.6 mm. This necessitates minimum reduction of about 0.7 mm. **1.2 mm reduction will always be best because thinner Empress is easily cracked during finishing, polishing and cementing.**

2. Empress is not reliable for posterior teeth. Five plus year failure rates are 3% for anterior, 7% for bicuspid, and 21% for molars. Do not use Empress for molars.
3. Empress inlays with resistance form (do not rely on bonding) are reliable. However, Kadena ADL has limited capacity in Empress. Empress is a wonderful and cost effective material for anterior crowns, and our limited resources are best used for these restorations.
4. Empress onlays fail at high rates-approximately 30% at 5 years. These should not be used.
5. Empress should not be air abraded after its last firing. Air abrading creates flaws which lead to early failure.
6. A metal core under Empress may lead to slightly higher long-term success rates. When



all ceramics are cemented onto stiffer and harder substrates, long-term success is better. The effect is not statistically significant for Empress at 10 year follow-ups. This effect is statistically significant for Inceram and Dicor.

7. Resin cements should be used because they produce a stronger result. Resin cements fill in microflaws on the intaglio surface and inhibit their growth.
8. Empress has significantly lower failure rates than Inceram at 10 plus year marks. Failures in Inceram occur between the core and veneering porcelain, and within the core itself. This is interesting and significant because Inceram is significantly stronger than Empress. It is possible that the Lanthium glass used in Inceram deteriorates. This could be caused by microleakage.

EMPRESS TWO

Kadena ADL continues to have good success with Empress 2, with two failures to date out of approximately 40 FPDs. The following guidelines must be observed when prescribing the material.

1. 1 mm reduction is necessary.
2. Connectors for FPDs must be 4 mm by 4mm. This may contraindicate use with short abutment teeth.
3. Empress two is for short span FPDs replacing a single anterior tooth. However, as long as guidelines are met, partial veneer and bonded FPD designs are possible.

FAILURE RATES FOR CROWNS AND FPDs

Recently, I listened to several lectures on failure rates for crowns and FPDs. Results from different investigators are not completely consistent but the following generalizations can be made.

1. Single crowns, including all ceramics for anterior teeth, are among the most reliable

restorations we make. Failure rates at ten-years hover in the 5% range. (My anecdotal experience indicates that lower molar PFMs fail at much higher rates.)

2. Fixed partial dentures fail at much higher rates, and these rates are variable from one study to another. A composite failure rate at 10 years is about 25%. Anecdotal experience implies that different locations fail at different rates and for different reasons. For example, FPDs with maxillary lateral incisors as abutments are likely to fail because this tooth breaks, whereas FPDs with lower molar abutments are likely to fail due to the molar abutment loosening. Furthermore, experience indicates failure rates vary greatly amongst operators, implying that FPD placement is technique sensitive. If your technique varies much from the ideal 6-12 degrees taper on opposing walls of 4 mm you may be setting your patient up for later failure. An added concern is that failed FPDs generally leave the patient in worse condition than he would be had you done nothing. **Be conservative in your recommendations for tooth replacement with fixed partial dentures.**
3. Failure rates for RBFDPs at 5 years are as high as 55% and as low as 0%, depending on the study. This implies severe technique and case selection sensitivity. Other significant generalizations can be made. Longer span RBFDPs fail at very high rates. In one study, 25% of 3 unit RBFDPs failed by 5 years while 52% of 3 plus unit cases failed. RBFDPs may be contraindicated for bruxers with one study reporting a 70% failure rate at 5 years. Incorporation of beefy and parallel grooves and rests improves reliability with a 15% failure rate when these features were incorporated vs. a 47% failure rate when they were not.

DR CURTIS'S OPINIONS AND FPD RECOMMENDATIONS

1. All FPDs eventually fail. Be conservative in your recommendations for fixed tooth replacement. (A relative has two anterior FPDs replacing cuspids that are intact after over 40 years.)
2. Removable partial denture treatment is safer than fixed. If you have doubts about the length of the space, strength, length or angulations of the abutments, etc., consider removable. If you are not certain of the type preparation to use, or about how to best prepare, get a second opinion.

3. Resin bonded FPDs are a special case. Some dentists use them frequently, while others only rarely. They are my first choice only for lower anterior tooth replacement. I make limited preparations that include resistance form features. I occasionally use RBFDPs to replace posterior teeth, but I consider them long-term provisional restorations, and do very little preparation. Another prosthodontist at Kadena routinely makes posterior RBFDPs. His preparations are precise, and incorporate grooves, rests and other resistance form features. These preparations are more technically demanding than standard crown and bridge preparations, and restorations are also difficult for our laboratory to fabricate. I think two generalizations can be made about RBFDPs. 1. You should incorporate resistance form features into your design. If you do not, consider them long-term provisional restorations. (Two beefy wings on an un-prepped conical tooth may provide resistance form.) 2. Preparation and high quality fabrications are at least as difficult as replacing teeth with partial veneer preparations. Do not choose RBFDPs because they are easier.

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