

RESTORE[®] Implant System

Prosthetic Manual



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Fixed Detachable Abutment System

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Symbols Key



= Caution



= Note



= Tip

Certain products may not be available in all countries.

Introduction

This Prosthetic Manual is designed to aid clinicians in basic prosthetic procedures using the RESTORE External Hex Implant System. The abutment systems described can be used in all areas of the mouth, for single tooth applications, fixed or detachable bridgework and overdenture techniques.

The procedures and guidelines presented in this Manual are not a substitute for formal implant restoration training for the restoring doctor and dental laboratories. It is the responsibility of the clinicians and dental laboratories to determine the final protocol and component selection.



Federal (USA) law restricts this device to sale by or on the order of a licensed dentist or physician.

Indications

The RESTORE Implant System is intended for use in either partially or fully edentulous areas in the maxilla or mandible in support of single or multi-unit restorations. The implants also function as terminal or intermediate abutment support for fixed bridgework.

PROSTHETIC CONSIDERATIONS:

- Cement-Retained Restorations (Fixed) utilizing multiple abutments
- Screw-Retained Restorations (Fixed Removable) utilizing multiple abutments
- Implant or Bar Attachment-Retained Overdenture Restorations
- Single Tooth Restorations without involvement of adjacent dentition

Sterilization

Select prosthetic components are provided in sterile, gamma irradiated packaging. Please refer to individual package labeling to determine if the prosthetic component is sterile.

If necessary, all-metal components can be re-sterilized according to Keystone Dental's sterilization table:

Sterilization Table

1. Autoclave: 121-124°C (~250°F) 60 minute exposure / 40 minute dry time or 132-135°C (~270°F) 40 minute exposure / 30 minute dry time. Do not exceed 140°C (~284°F). Always use the dry cycle.



Do not use the original packaging in the autoclave! Autoclave re-sterilization can only be accomplished by placing the individual components in the surgical tray, a sealed autoclave bag or in a surgical towel.

2. Dry Heat: 160°C (320°F) 120 minutes (minimum). Do not exceed 170°C (338°F).

It is recommended that the proper biological indicators for the selected sterilization method accompany each load and that the appropriate sterile packaging be used to maintain sterility until use.



Keystone Dental does not recommend chemclave sterilization procedures as they may damage surgical trays and/or instruments.

Basic Prosthetic Case Design Principles

Evaluate the following parameters when choosing the number of implants for the type of restoration used:

PROPER PROSTHETIC LOADING:

To ensure proper prosthetic loading, it is necessary to distribute the loads over the greatest bone-to-implant surface area possible. To do so, place the largest implant body available that the bone will accommodate. Long cantilevers and large inter-implant spaces should be avoided.

PARTIALLY EDENTULOUS ARCH:

For the partially edentulous arch, total implant support of the restoration without involving natural teeth, is recommended when possible.

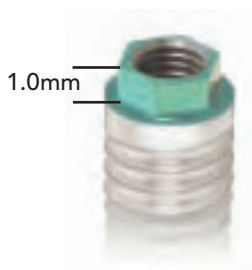
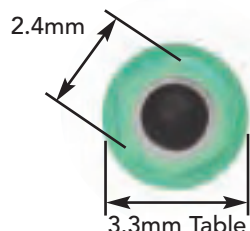
FULLY EDENTULOUS ARCH:

For a maxillary implant-supported, fixed detachable

restoration or bar attachment-retained overdenture, implants are usually placed from the bicuspid area in one quadrant of the maxillary arch to the bicuspid area on the opposite quadrant of the arch to avoid the maxillary sinuses. A fixed detachable restoration usually requires five to six implants, while a bar attachment-retained bar overdenture usually requires four to six implants. Place the implants as symmetrically as possible to ensure balanced occlusal forces. For a mandibular implant-supported, fixed detachable or bar attachment-retained overdenture, implants are usually placed in the symphysis between the mental foramen or distal to the mental foramen, avoiding the anatomical restrictions of the mandibular canal.

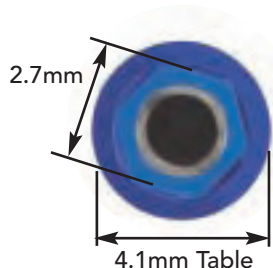
For an implant attachment-retained overdenture, two to three implants are usually sufficient. Overdenture abutments should not be used if implants are divergent beyond 15 degrees.

Keystone Dental's external hex dental implants are engineered around three (3) prosthetic table diameters for clinical versatility, stability and strength. "Prosthetic Table" refers to the outside diameter at the top of the implant where the prosthetic component interfaces with the implant. The Restore prosthetic tables are divided into Small Diameter (SD), Regular Diameter (RD) and Wide Diameter (WD). Each diameter is described below.



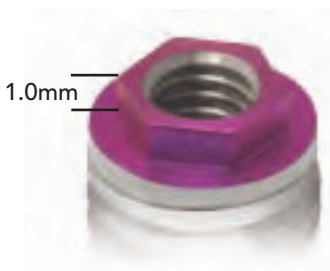
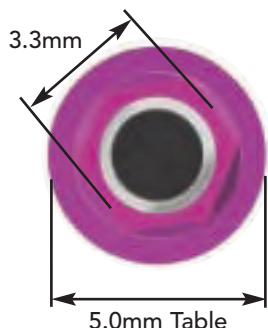
Small Diameter Surgical and Restorative Flexibility

- Used on RESTORE 3.3mm implants.
- The SD implant's narrow prosthetic table makes it an excellent choice when interproximal space is limited.
- The SD's 1mm tall external hex provides greater support and tactile feel when seating components, allowing a more positive seat.
- The SD is ideal for single tooth restorations due to its increased strength.¹



Regular Diameter Universal Compatibility

- Used on RESTORE 3.75 and 4.0mm implants.
- Design based on 30+ years of clinical research.
- A leader in prosthetic connection fit.^{2,3}
- RD implants provide universal prosthetic compatibility with the following implant systems:
 - Nobel Biocare® - 3.75, 4.0mm
 - Steri-Oss HL - 3.8, 4.5mm
 - Zimmer Taper-Lock® - 3.75mm
 - Implant Innovations, 3i - 3.75, 4.0mm



Wide Diameter Leader of the Wides

- Used on RESTORE 5.0 and 6.0mm implants.
- Solid design maximizes overall performance when interacting with compressive occlusal forces, off-axis occlusal forces and torsional forces.
- Provides 79% more surface area and 43% more height⁴ than the standard hex size for unparalleled strength and exceptional resistance to deformation and stripping of the hex.⁴
- 2.5mm abutment screw provides 65% more strength than the standard 2.0mm screw for additional resistance to off-axis loads and improved torque retention.⁴

¹ Klardie, M. "Small Diameter (SD) Implants: A Strength Comparison." *Oral Restorative Update* Vol. 4, No. 2 (1997).

² Binon, P. "Evaluation of Three Slip Fit Hexagonal Implants." *Implant Dentistry* 5.4 (1996).

³ Binon, P. "Test Data Confirms Close Tolerance Machining of Restore® System." *Oral Restorative Update* Vol. 3, No. 1 (1996).

⁴ Slabberkoom, Scott D., P.E., M.S.E., "Wide Diameter Implants - A Balanced Design Approach." *Oral Restorative Update*, Fall 1996.

accu-torque wrenches and drivers

ACCU-TORQUE WRENCHES

Accu-Torque Wrenches are available in three torque calibrations. Refer to the table below for torque recommendations.



Accu-Torque Wrenches

ACCU-TORQUE DRIVERS

Keystone Dental offers Accu-Torque Drivers in several hex sizes and lengths. See the *RESTORE Product Catalog* for all available sizes and lengths.



Accu-Torque Drivers

TORQUE GUIDELINES

- Place the driver into the abutment or fastening screw. Be sure that the hex hole is fully engaged with the driver.
- With the rounded edge facing downward, seat the torque wrench driver into the wrench.
- Place a finger on the head of the torque wrench. Follow the direction of the arrow and tighten to the specific torque value stated below.
- When the head of the torque wrench "breaks" or releases, do not tighten any further or the abutment/fastening screw may strip or break.

TORQUE RECOMMENDATIONS

Small Diameter (SD) 3.3mm and 3.4mm Implants	Regular Diameter (RD) 3.75mm, 4.0mm and 4.2mm Implants	Wide Diameter (WD) 5.0mm and 6.0mm Implants
ABUTMENT SCREWS¹ (GOLD OR TITANIUM) 30Ncm	ABUTMENT SCREWS¹ (GOLD OR TITANIUM) 30Ncm	ABUTMENT SCREWS¹ (GOLD OR TITANIUM) 30Ncm
FASTENING SCREWS² (GOLD OR TITANIUM) 10Ncm	FASTENING SCREWS² (GOLD OR TITANIUM) 10Ncm	FASTENING SCREWS² (TITANIUM) 20Ncm

1. Abutment screws engage the internal threads of the implant.

2. Fastening screws engage the internal threads of a transmucosal abutment (i.e. standard or conical abutments).

impression taking guidelines

IMPLANT LEVEL IMPRESSION POSTS

The majority of impressions taken are implant level impressions. Each diameter impression post is packaged with a long screw for an open tray impression or a short screw for a closed tray impression. When implants are divergent from each other, angled or placed across the arch, an open tray impression is recommended. When restoring a single tooth implant, a closed tray impression can be used.

UCLA IMPRESSION POSTS



Use the appropriate diameter of the UCLA Impression Post to match the contour of the healing abutment. For more details on contoured healing abutments, see the *RESTORE Product Catalog*.

FEATURES:

When seating the impression post onto the implant, the impression post captures the implant's vertical and the rotational position of the hex. The engagement of the male hex portion of the implant and the female portion of the impression post provides the "anti-rotation" of the abutment on the implant. These UCLA Impression Posts all have a female hex at the base of the impression post body.



PROCEDURE FOR SEATING THE UCLA IMPRESSION POST:

Place the long screw (Open Tray Technique) or short screw (Closed Tray Technique) into the top of the impression post body. Use the .048" Hex Driver to seat the impression post onto the hex of implant. Turn the screw two or three times to engage the implant threads. Rotate the impression post body until it drops over the hex of the implant. Turn the screw firmly until it is completely tightened. Take an x-ray to verify that the impression post is completely seated.

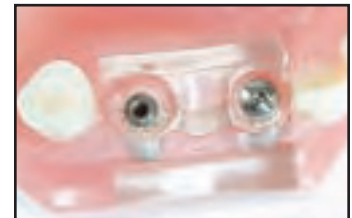


If bone or soft tissue prevents the impression post from fully seating on the implant, use the Bone Profiler to clean up the interface. This will help to create proper bone contours. For more details on the Bone Profiler System see the *RESTORE Product Catalog*.



procedure for taking an open tray impression

- Step 1:** Take an alginate impression of the implant site and fabricate a full arch custom tray.
(Block out over the implant sites approximately 15mm. All other areas of the arch use the standard block out technique.)
- Step 2:** Cut hole(s) in the top of the custom tray over the implant sites to allow the Impression Post Screw to protrude through the top of the tray.
- Step 3:** Remove the healing abutment with a .048" Hex Driver.
(If it is a multi-unit restoration, remove one healing abutment at a time and then place an impression post to prevent the tissue from slumping.)
- Step 4:** Inspect the implant prosthetic table for tissue invagination.
(If tissue is covering the prosthetic table, replace the healing abutment lightly and return to the surgeon or contact the surgeon for guidance.)
- Step 5:** Place the open tray transfer impression post on the implant prosthetic table with the same hex driver. *(Slide the screw down through the top of the impression post body. Seat the screw and impression post together on the prosthetic table. Tighten the screw with one turn clockwise to engage the threads. Then, seat the body of the post over the hex of the implant. Tighten the screw using firm finger pressure.)*
- Step 6:** Use an x-ray to verify that the impression post is completely seated. *(The x-ray cone should be perpendicular to the implant prosthetic table.)*
- Step 7:** Place the custom tray in the mouth to verify that the screws are extended approximately 2mm above the top of the tray.
- Step 8:** Block out the hex hole in the top of the screw.
(Use wax, Cavit®, Gutta Percha or Play-Doh®.)



procedure for taking an open tray impression

- Step 9:** Syringe the impression material around the entire body of the impression post exposing only the top of the screw.
(Impression materials can be any medium to heavy body polyvinylsiloxane.)



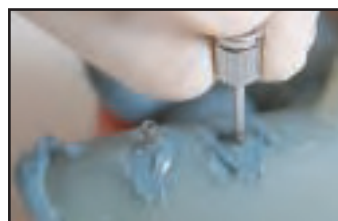
- Step 10:** Fill and seat the custom tray in the mouth covering the impression post and exposing the top of the screw through the hole in the top of the tray.



- Step 11:** Once the impression tray is seated, remove some of the impression material from the top of the tray to expose the screw through the top of the tray.



- Step 12:** Once the material has set, remove the screw from the impression and remove the impression tray from the mouth.
(The impression post will be embedded inside of the impression.)

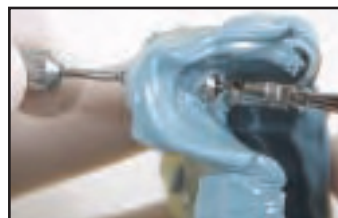


- Step 13:** Replace the healing abutment.
(Remove one impression post at a time and seat the healing abutment.)



- Step 14:** Inspect the impression for accuracy.

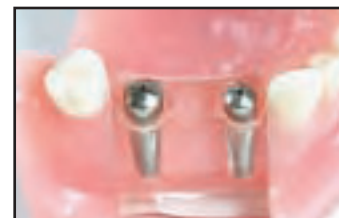
- Step 15:** Place the implant analog (replica of the implant) into the hex of the impression post body. Slide the screw through the top of the impression and engage the analog. (Hand tighten the screw. Firmly hold the analog so the impression post will not move or dislodge.)



- Step 16:** Send the impression with the seated impression post, opposing model and bite to the laboratory.

procedure for taking a closed tray impression

Step 1: Take an alginate impression of the implant site and fabricate a full arch custom tray. *(Block out over the implant sites approximately 15mm. All the other areas of the arch use a standard block out technique.)*



Step 2: Remove the healing abutment with a .048" Hex Driver. *(If it is a multi-unit restoration, remove one healing abutment at a time and place the impression post to avoid the tissue from slumping.)*



Step 3: Inspect the implant prosthetic table for tissue invagination. *(If the tissue is covering the prosthetic table, replace the healing abutment lightly and return to the surgeon or contact the surgeon for guidance.)*



Step 4: Place the closed tray transfer impression post on the implant prosthetic table with the same hex driver. *(Slide the screw down through the top of the impression post body. Then, seat the screw and impression post together on the prosthetic table. Tighten the screw one turn clockwise to engage the threads. Then, seat the body of the post over the hex of the implant. Tighten the screw using firm finger pressure.)*



Step 5: Use an x-ray to verify that the impression post is completely seated. *(The x-ray cone should be perpendicular to the implant prosthetic table.)*

Step 6: Block out the hex hole in the top of the screw. *(Use wax, Cavit, Gutta Percha or Play-Doh.)*



procedure for taking a closed tray impression

- Step 7:** Syringe the impression material around the entire impression post.
(*Impression materials can be any medium to heavy body polyvinylsiloxane.*)



- Step 8:** Fill the full arch impression tray with impression material and seat the custom tray in the mouth covering the impression post.



- Step 9:** Once the material has set in the mouth, remove the impression tray.
(*The impression post body and short screw will remain in the mouth.*)

- Step 10:** Remove the impression post with the same hex driver and replace the healing abutment.



- Step 11:** Inspect the impression for accuracy.

- Step 12:** Take the impression post and analog (replica of the implant), seat the impression post onto the analog and hand tighten the screw with a hex driver.



- Step 13:** Seat the impression post back into the impression with the flat side of the post to the flat side of the impression.

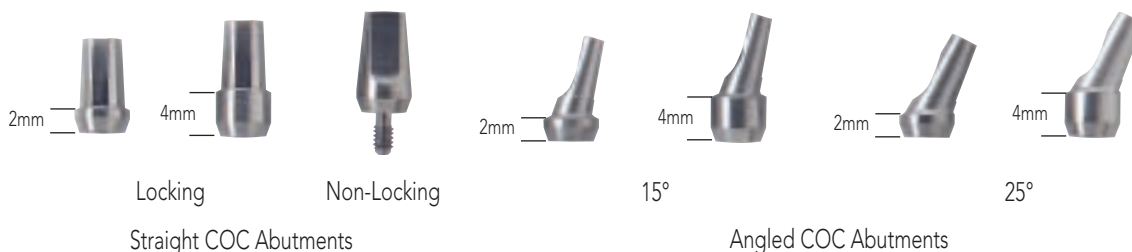


- Step 14:** Send the impression with the seated impression post, opposing model and bite to the laboratory.



Cement-on Crown (COC) Abutment System

The COC Abutment is a titanium tapered abutment that extends through the tissue into the oral cavity. It contains an internal hex to aid in anti-rotation when used as a single tooth abutment. The abutment is held in place on the implant using a separate gold or titanium screw. The COC Abutments are available in the Small Diameter (SD), Regular Diameter (RD) and Wide Diameter (WD) prosthetic tables with straight, 15° Angle or 25° Angle and with 2mm or 4mm cuff height.



PROSTHETIC OPTIONS:

- Can be used for single or multi-unit (splinted) crown and bridge restorations.
- The gold screw requires the use of a Square Driver. The titanium screw requires a .048" Hex Driver.
- Pre-machined margins simplify abutment preparation. In addition, they may be prepared to follow gingival contours.

TECHNICAL CONSIDERATIONS:

- A minimum interocclusal clearance of 4.5mm plus the restoration thickness is required between the implant prosthetic table and the occlusal plane.
- The straight locking COC Abutment may be used when space near the adjacent teeth or implants is limited.

TWO METHODS FOR PREPARATION OF THE COC ABUTMENT:

1. If the patient has a temporary prosthesis that they are currently wearing, then you may elect to have the laboratory prepare the COC Abutment. See the following section on *Lab Preparation of the COC Abutment*.
2. If the patient requests that they leave the office with a temporary restoration, then the COC Abutment must be prepared chairside and a temporary restoration must be fabricated. See the *Chairside Preparation and Temporization* section on pages 15 and 16 of this Prosthetic Manual.

LAB PREPARATION OF THE COC ABUTMENT

CLINICAL PROCEDURE

Impressioning



When abutment(s) are prepared in the dental laboratory, an implant level impression utilizing either a closed tray or open tray technique is required. Refer to pages 6-10 of this Prosthetic Manual for implant level impression techniques.

LABORATORY PROCEDURE

Master Model Fabrication



Attach the implant analogs to the impression posts. A soft tissue model is recommended to provide an accurate replication of the patient's soft tissue.

Step 1: Pour the soft tissue around the implant analogs. When the material has set, pour a stone master model.



Master Model

COC Abutment Modification

Step 2: When selecting the proper COC Abutment cuff height, measure the tissue depth from the top of the implant analog to the height of the soft tissue. For esthetics, the final margin of the COC Abutment should be 1-2mm below the tissue height.



Height Reduction Marked

Step 3: Place the COC Abutment. Determine if a reduction in the height of the abutment and/or the cuff is required. Mark the abutment with a felt tip marker.



Completed COC Abutments

Step 4: Modify the COC Abutment.



To improve stability while adjusting the COC Abutment, attach an implant analog to the abutment.



For multi-unit cases, the laboratory may fabricate a "positioning jig" using a pattern resin material. The clinician can transfer the abutment from the master model to the mouth, simplifying the abutment seating procedure.

Step 5: After preparation is complete, block out the top of the screw access hole to prevent wax from flowing into this area.



Completed Positioning Jig

Metal Framework Fabrication

Step 6: Wax the understructure using conventional crown and bridge techniques.



When waxing the understructure, using a die spacer is recommended. Keep in mind that the actual size of the final crown will be smaller buccal/lingual than the normal tooth or teeth the restoration is replacing.



Wax Understructure Completed

Step 7: Spruing, investing and casting is completed following conventional crown and bridge techniques.

Step 8: Finish the metal framework using conventional crown and bridge techniques.



To confirm a passive fit of multi-unit restorations, an inter-oral metal try-in is recommended.



Waxed Understructure Sprued

cement-retained restorations

CLINICAL PROCEDURE

Metal Framework Try-In

Step 1: Remove the healing abutment(s) using a .048" Hex Driver.



Remove one healing abutment at a time and place the appropriate COC Abutment (to prevent tissue slumping). When removing the healing abutments, working from the posterior of the patient's mouth to the anterior is recommended. If the laboratory fabricated a positioning jig, remove all of the healing abutments and seat the abutment(s) utilizing the positioning jig.



Gold abutment screws require the use of a square driver. Titanium abutment screws require a .048" Hex Driver.

Step 2: Remove the metal framework from the master model. Before placement in the mouth, note on the model the orientation marks on the COC Abutments.

Step 3: Place the COC Abutments in the patient's mouth. Note the position the orientation dots/marks as they were on the model or use a positioning jig if supplied.

Step 4: Take an x-ray to verify that the abutment(s) are completely seated.

Step 5: Use a 30Ncm Accu-Torque Wrench and an Accu-Torque Driver to tighten the abutment(s) in the mouth.

Step 6: Place the metal framework and verify that the framework fits passively.



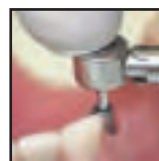
COC Abutments on Model



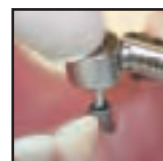
Completed Positioning Jig



COC Abutments in Mouth



Applying Torque
(Normal wrench
position)



Torque Applied
(Wrench head in
broken/release
position)



Metal Framework Seated



If the framework binds as it is seated or does not go completely down to the margin of the abutment(s), then the bridge must be cut, related in the mouth and returned to the laboratory for soldering/laser welding. It may be possible to use an indicating spray or paste to determine if the internal aspect of the bridge can be modified to allow the bridge to seat.



If the framework is not passive, mark the area where the abutment is not seating and needs to be sectioned. Then, remove the framework from the patient's mouth. Section the framework, creating a space of approximately 0.3mm using an ultra-thin disc. Using a pattern resin material, lute the sections of the framework together.

Once the material has set to the manufacturer's specifications:

- Return the metal framework to the laboratory to be soldered/laser welded and returned for an (optional) secondary framework try-in.
- OR**
- Pick up the luted together framework in a secondary full arch impression. Then, return the framework to the laboratory for soldering/laser welding and porcelain application.

Step 7: Block out the screw access hole(s) with a retrievable material and cement the temporary prosthesis.



Block Out of Screw Access Holes

LABORATORY PROCEDURE

Porcelain Application

Proceed with porcelain application following normal laboratory procedures. Return the restoration on the master model to the clinician.

CLINICAL PROCEDURE

Final Insertion

Remove the temporary prosthesis from the patient's mouth. Verify that the temporary cement is completely removed from the abutment. Place the final restoration onto the abutments prior to cementation. Check the occlusion, contacts and margin integrity. There should be no occlusal contact in excursive movements and only light contact in centric occlusion. Once satisfied, use temporary cement for easier retrievability if future access to the abutment/screw is desired.



Final Restoration

CHAIRSIDE PREPARATION AND TEMPORIZATION

CLINICAL PROCEDURE

Chairside Preparation



Preparation of Straight or Angled COC Abutments follows a similar process. Slight changes in preparation of the Angled COC Abutments will be noted in this section.



When intraoral abutment modification is necessary, use copious amounts of irrigation to eliminate excessive heat buildup in the surrounding bone tissue that may compromise the osseointegration of the implant.

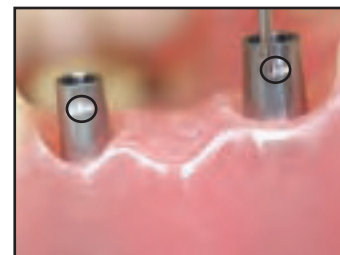
Step 1: Remove the healing abutment using a .048" Hex Driver.

Step 2: When selecting the proper COC Abutment cuff height, measure the tissue depth from the top of the implant to the height of the soft tissue. For esthetics, the margin of the abutment (the cuff height) should be 1-2mm below the gingival tissue height.

Step 3: Use your hex driver to seat the appropriate COC Abutment (Straight or Angled). Determine if a reduction in the height of the abutment and/or the cuff is required. Mark the abutment with a carbide bur or felt tip marker.



A twelve-point locking mechanism on the base of the Angled COC Abutment permits the correct indexing of the abutment for proper angle correction.



Marking Height Reduction

Step 4: Remove the abutment from the patient's mouth and modify the abutment.



To improve abutment stability while adjusting, attach an implant analog to the abutment.



Height Reduction

Step 5: After the correct height is obtained, place the COC Abutment, then use an x-ray to verify a complete seating. Tighten the abutment screw using a 30Ncm Accu-Torque Wrench and a .048" or Square Accu-Torque Driver.

Step 6: Final adjustments using a coarse diamond bur may be completed in the mouth.



In Mouth Preparation



After final preparations are made, verify that the abutment has not come loose. Do so by tightening the abutment screw with the torque wrench.

Step 7: Protect the abutment screw from cement by filling in the screw access hole(s) with a Cavit, Gutta Percha or a material such as Fermit®, which is a light-cured, very firm material that can be easily removed if necessary.

Step 8: Conventional impression techniques are used for the final restoration. (Always take a full arch impression.) If the margin is subgingival, retraction cord may be necessary. A temporary restoration should be fabricated to support the tissues.



COC Abutments Ready for Impression

LABORATORY PROCEDURE

Fabrication of the Restoration



To prevent chipping or breaking of the master die when the clinician's preparations are extremely narrow, it is recommended to pour the master die using an epoxy type die material.

Step 1: Wax, invest, cast and finish the understructure using conventional techniques.

Step 2: Proceed with porcelain application following normal laboratory procedures. Return the final restoration on the master model to the clinician for final insertion.

CLINICAL PROCEDURE

Final Insertion

Remove the temporary prosthesis from the patient's mouth. Verify that the temporary cement is completely removed from the abutment. Place the final restoration onto the abutment(s) prior to cementation. Check the occlusion, contacts and margin integrity. There should be no occlusal contacts in excursive movements and only light contact in centric occlusion. Once satisfied, use temporary cement for easier retrievability if future access to the abutment/screw is desired.



To prevent tissue irritation or implant failure, make sure there is no excess cement left in the sulcus surrounding the abutment/implant interface.



Final Restoration

Custom Abutment Fabrication with the UCLA Abutment

Technical information on the UCLA Abutment, its options and considerations can be found on page 20 in this Prosthetic Manual.

LABORATORY PROCEDURE

Master Model and Abutment Fabrication



An implant level impression utilizing either a closed tray or an open tray technique is required. (See pages 6-10.) A soft tissue model is recommended to provide an accurate replication of the patient's soft tissue.

Step 1: Attach the implant analogs to the impression posts and pour the soft tissue around the implant analogs. When the material has set, pour a stone master model.

Step 2: Place the UCLA Gold/Plastic Combo Sleeve on the master model.



If the UCLA Plastic Sleeves are used, be sure to choose the correct diameter to match the contour of the healing abutment used clinically.



Reamers are available for the plastic sleeves. They are used to refine the screw access chimney and the screw seat interface after casting.

Step 3: Determine the modifications needed to provide adequate clearance for adjacent and opposing dentition. Shorten the plastic sleeve with a cut-off disc to obtain the correct vertical and interproximal height. Adjust the plastic sleeve for the proper angulations.

Step 4: Lightly lubricate the abutment screw so that wax and/or acrylic will not stick to the screw when removing it from the abutment. Add wax and/or acrylic burnout resin to the sleeve to contour the abutment into the appropriate dimensions.



Extend a small amount of wax onto the gold base to ensure a smooth junction between the gold base and the plastic sleeve.

Step 5: Spruing, investing and casting is completed following conventional crown and bridge techniques. See the UCLA Gold/Plastic Sleeve package insert, for technical data on casting and melting temperatures.



Gold/Plastic Sleeve Uncut on Model



UCLA Plastic Sleeves



Modified Gold/Plastic Sleeve



Completed Custom Abutment in Wax



Sprued Custom Abutment



Be careful to pour the investment into the ring very slowly. Watch for the investment to completely flow up through the screw access hole.



Blast material is not recommended for divesting. Use of a chemical investment remover is recommended to preserve the abutment/implant prosthetic table interface.

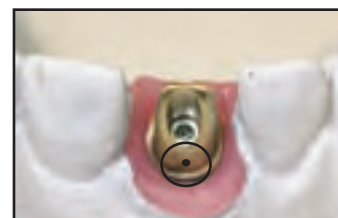


Before
After
Chemically Divested Custom Abutments

Step 6: Confirm a passive fit on the master model. The soft tissue material can be removed to verify an accurate fit of the custom abutment to the implant analog on the model. Polish any part of the abutment that will be exposed to the patient's tissue.



When polishing the abutment collar, attach an implant analog to protect the interface between the abutment and the implant.

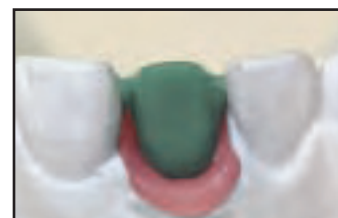


Custom Abutment on Master Model



Block out the screw access hole and apply a die spacer to the abutment.

Step 7: Wax, invest, cast and finish the understructure using conventional crown and bridge techniques.



Waxed Coping

Step 8: Proceed with porcelain application following normal laboratory procedures.



Porcelain Restoration on Master Model

CLINICAL PROCEDURE

Final Insertion

Step 1: Inspect the position of the custom abutment on the working model before transferring it from the model to the mouth.

Step 2: Use a .048" Hex Driver to remove the healing abutment from the patient's mouth.



Custom Abutment on Master Model

cement-retained restorations

Step 3: Place the abutment in the patient's mouth following the orientation marks or use a positioning jig if supplied.



Gold abutment screws require the use of a square driver. Titanium abutment screws require a .048" Hex Driver.

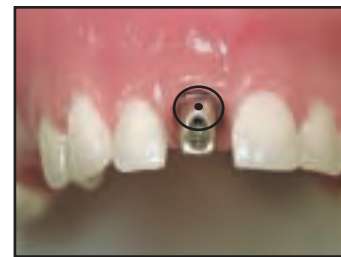
Step 4: Take an x-ray to verify that the abutment(s) is completely seated.

Step 5: Use a 30Ncm Accu-Torque Wrench and a Square or .048" Accu-Torque Driver to tighten the final abutment in the mouth.

Step 6: Place the final restoration on the abutment prior to cementation. Check the occlusion, contacts and margin integrity. There should be no occlusal contacts in excursive movements and only light contact in centric occlusion. Once satisfied, use temporary cement for easier retrievability if future access to the abutment/screw is desired.



To prevent tissue irritation or implant failure, make sure there is no excess cement left in the sulcus surrounding the abutment/implant interface.



Final Abutment



Final Restoration

UCLA Abutment System

The UCLA Gold/Plastic or AC (Aesthetic Contour) Plastic Abutment is designed to achieve optimal contouring of the soft tissue for a more esthetic emergence of the restoration through the tissue. The AC Plastic Sleeve is offered in a variety of diameters, which correspond to matching AC Healing Abutments.



PROSTHETIC OPTIONS:

- Can be used for single or multi-unit (splinted) cement or screw-retained crown and bridge restorations.
- Can be used for bar attachment-retained overdenture restorations.
- Used to fabricate highly esthetic custom restorations that attach directly to the implant.

TECHNICAL CONSIDERATIONS:

- A minimum interocclusal clearance of 4.5mm for SD and RD and 5.0mm for WD UCLA Abutments is required between the implant prosthetic table and the top of the abutment screw when seated.

OTHER RESTORATIVE OPTIONS FOR SCREW-RETAINED RESTORATIONS:

Keystone Dental provides a Conical Abutment for fabrication of screw-retained restorations. Because of its 15 degree tapered side walls, divergence between implants can be corrected up to 30 degrees with the Conical Abutment.



Conical Abutments

CLINICAL PROCEDURE

Impressioning



For implant level impressions, refer to pages 6-10 in this Prosthetic Guide for an open tray or a closed tray impression technique. The laboratory will be able to select the proper abutments from either one of these impressions.

screw-retained restorations

LABORATORY PROCEDURE

Master Model Fabrication



Attach the implant analogs to the impression posts. A soft tissue model is recommended to provide an accurate replication of the patient's soft tissue.

Step 1: Pour the soft tissue around the implant analogs. When the material has set, pour a stone master model.

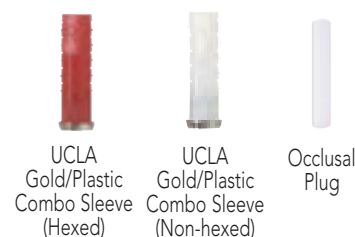


Master Model

Abutment Selection

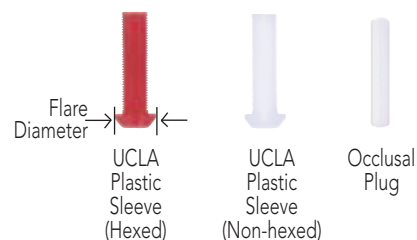
UCLA GOLD/PLASTIC COMBO SLEEVES

- Gold/Plastic Combo Sleeve combines a precision machined interface with the convenience of a castable plastic chimney
- Offered in both hexed (red sleeve) and non-hexed (white sleeve)
- Includes an Occlusal Plug to protect the screw access hole



UCLA PLASTIC SLEEVES

- Offered in hexed (red sleeve) and non-hexed (white sleeve)
- Diameters to match the AC healing abutments
- Includes an Occlusal Plug to protect the screw access hole



If the plastic sleeves are used, be sure to choose the correct diameter to match the healing abutment.



Reamers are available for the plastic sleeves. They are used to define the screw access chimney and the screw seat interface after casting.

Metal Framework Fabrication

Step 2: Place the UCLA Gold/Plastic Combo Sleeve on the master model.

Step 3: Reduce the plastic chimney with a rubber wheel. The plastic sleeve should be reduced so it is slightly out of occlusion. Lightly lubricate the abutment screw. Add wax and/or acrylic resin following normal crown and bridge techniques.



Modified Gold/Plastic Combo Sleeve



Extend a small amount of wax onto the gold base to ensure a smooth junction between the gold base and the plastic sleeve.

Step 4: Spruing, investing and casting are completed following conventional crown and bridge techniques. See the UCLA Plastic Sleeve package insert for technical data on casting and melting temperatures.



Completed Framework in Wax



Be careful to pour the investment into the ring very slowly. Watch for the investment to completely flow up through the screw access hole.



Blast material is not recommended for divesting. Use of a chemical investment remover is recommended to maintain the abutment/implant prosthetic table interface.



Before



After

Chemically Divested Abutments

Step 5: Confirm a passive fit on the master model. The soft tissue material can be removed to verify an accurate fit of the framework to the implant analog on the model. Polish any part of the abutment/framework that will be exposed to the patient's tissue.



If the restoring doctor requested a temporary restoration, fabrication can be done using temporary sleeves.



An inter-oral metal try-in on all multi-unit restorations to confirm a passive fit is recommended.



Framework on Master Model

CLINICAL PROCEDURE

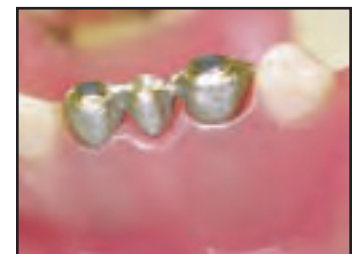
Metal Framework Try-In

Step 1: Remove the healing abutments with a .048" Hex Driver. Place the bridge in the mouth without any abutment screws. Verify the fit of the bridge by doing the following:

1. Place the first abutment screw and confirm a passive fit.
2. Continue until all abutment screws are placed.
3. If any abutments are not completely seated on the implant, section the bridge and lute all the sections together.
4. Return to the laboratory for a solder/laser weld for a new metal try-in or porcelain application.



Gold abutment screws require the use of a square driver. A Titanium abutment screw requires a .048" Hex Driver.



Framework in Mouth

LABORATORY PROCEDURE

Porcelain Application

Apply porcelain following normal crown and bridge techniques.



Do not sandblast the pre-machined surface of the metal framework.

screw-retained restorations



When polishing the abutment collar, attach an implant analog to protect the interface between the abutment and the implant.

CLINICAL PROCEDURE

Final Insertion

Step 1: Use a .048" Hex Driver to remove the screw-retained bridge from the working model. Inspect the internal aspect of the abutment base for any glaze or porcelain that may have overextended into the female portion of the abutment or the interface with the implant prosthetic table.

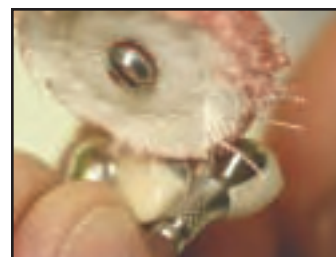
Step 2: Remove the healing abutments with a .048" Hex Driver.

Step 3: Without the screws in place, seat the completed restoration onto the implants in the mouth. Check the contacts before tightening the abutment screw. Place one screw and examine the fit. Place the remaining screw(s). All screws should be seated with firm finger pressure. With the restoration fully seated, check and adjust the contacts as needed.

Step 4: Check the occlusion, contacts and margin integrity. There should be no occlusal contact in excursive movements and only light contact in centric occlusion. If the crowns are subgingival, take an x-ray to verify a complete seating.

Step 5: Torque the final bridge in place using a 30Ncm Accu-Torque Wrench and a .048" Accu-Torque Driver.

Step 6: All UCLA Abutments include an occlusal plug to fill the screw access hole. The concave end of the plug is placed towards the occlusal. Place the occlusal plug into the screw access hole and shorten enough to allow room (1-2mm) for the composite. Fill the remaining portion of the screw access hole with composite. Adjust the occlusion, perform the final contours and polish with the recommended composite polishing paste.



Polishing Abutment Collar with Analog



Seated Restoration in Mouth



Applying Torque
(Normal wrench
position)



Torque Applied
(Wrench head in
release/broken
position)



Occlusal Plug



Final Restoration with Composite Plugs

Overdenture Restorations:

In most cases the patient perceives no esthetic difference between an implant attachment-retained and bar attachment-retained overdenture. However, the patient can expect a more stable (less movement) and a more expensive prosthesis with a bar attachment-retained overdenture. "Attachment-Retained" means the restoration has some type of built-in releasing mechanism that permits the restoration to reposition itself when the occlusal loads are applied. Therefore, a portion of the occlusal load is distributed to the soft tissue and the bony structures of the edentulous areas.

RESTORATIVE OPTIONS:

Implant Attachment-Retained Overdenture Tissue-Supported Prosthesis

- Primarily indicated for use in the mandible.
- Two or more implants are indicated.
- The patient removes the overdenture for proper hygiene.
- Denture is retained by female attachments only.
- Totally mucosa supported prosthesis.



Implant Attachment-Retained Overdenture

Bar Attachment-Retained Overdenture Tissue-Supported Prosthesis

- Indicated for use in the maxilla and mandible.
- Two or more implants are indicated.
- The patient removes the overdenture for proper hygiene.
- Various attachment mechanisms are used for retention of the denture.
- Slight movement provides the patient with stability and comfort.
- Bar design is 1 to 1.5mm above the tissue.



Bar Attachment-Retained Overdenture

Milled Bar Overdenture Implant-Supported Prosthesis

- Indicated for use in the maxilla and mandible.
- Six or more implants are indicated for this prosthesis in the mandible.
- Eight or more implants are indicated in the maxilla.
- The patient removes the denture for proper hygiene.
- Various attachment mechanisms are used for retention of the denture to the bar.



Milled Bar Overdenture

Screw-Retained Fixed Detachable Implant-Supported Prosthesis

- Primary indication for this prosthesis is the mandible.
- Six or more implants are indicated for this prosthesis in the mandible.
- Eight or more implants are indicated in the maxilla.
- Only the dentist removes this prosthesis.
- Is screw-retained directly to the implants or transmucosal abutments.
- The hybrid bar design is 2 to 2.5mm above the tissue.



Fixed Detachable Denture

overdenture restorations

PRELIMINARY CONSIDERATIONS

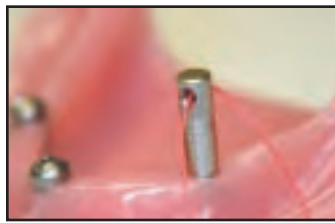
For Implant Attachment-Retained Overdentures

For predictable outcomes for an overdenture restoration, preliminary treatment planning is imperative.

1. Evaluate the patient's oral and general health.
2. Ask your laboratory to construct a wax set-up.
3. Evaluate the contours/angle of the bone for possible divergence of the implants.
4. Determine the interocclusal space available for the abutments and the attachment mechanism.
5. Ask your laboratory to help with design, abutment selection and attachment type.



Diagnostic Wax-Up



Tissue Measurement Gauge

IMPLANT ATTACHMENT-RETAINED OVERDENTURES

There are two types of abutment systems available, the Snap Abutment System and the O-Ring Abutment System. Below are the two different types of abutment options available for fully edentulous restorations.

Snap Abutment System

The Snap Abutment System is used with two or more implants. It provides an economical direct attachment for an implant attachment-retained overdenture restoration. The Snap Abutment threads directly into the implant. The Snap Abutment Assembly is processed into the denture base either chairside or at the laboratory. The Snap Abutment is available in 2, 3 or 4mm cuff heights to accommodate various tissue depths. It is also available for the Small Diameter (SD), Regular Diameter (RD) or Wide Diameter (WD) prosthetic table. Replacement retention inserts are available in low, medium and high retention levels.

TECHNICAL CONSIDERATIONS:

- A minimum interocclusal clearance of 7.0mm + cuff height is required.
- Implants must be relatively parallel to one another with less than 20 degrees of total divergence.
- If a patient cannot tolerate pressure on the mucosa, this type of restoration is not an option.
- The patient must have good manual dexterity to align the denture directly over the attachments prior to seating.



Snap Abutment Assembly with Analog

O-Ring Abutment System

The O-Ring Abutment System is used with two or more implants. It provides an economical direct attachment for an implant attachment-retained overdenture restoration. The O-Ring Abutment threads directly into the implant. The female O-Ring/Keeper is processed into the denture base either chairside or at the laboratory. The O-Ring Abutment is available in 2, 3 or 4mm cuff heights to accommodate various tissue depths. It is also available for the Small Diameter (SD), Regular Diameter (RD) or Wide Diameter (WD) prosthetic table. The O-Ring Abutment provides 360 degrees of resilient rotation.

TECHNICAL CONSIDERATIONS:

- A minimum interocclusal clearance of 6.0mm + cuff height is required.
- Implants must be relatively parallel to one another with less than 10 degrees of total divergence.
- If the patient cannot tolerate pressure on the mucosa, this type of restoration is not an option.
- The patient must have good manual dexterity to align the denture directly over the attachments prior to seating.



O-Ring Abutment System

LABORATORY FABRICATION OF A NEW DENTURE

CLINICAL PROCEDURE

Impressioning



For implant level impressions, refer to pages 6-10 in this Prosthetic Manual for an open tray or a closed tray impression technique. The laboratory will be able to select the proper abutments from either one of these impressions.

overdenture restorations

LABORATORY PROCEDURE

Master Model Fabrication

Step 1: Inspect the impression for accuracy.

Step 2: Pour the soft tissue around the implant analogs. When the material has set, pour a stone master model.



For both the clinical and the laboratory procedures for the wax rim try-in and the wax set-up, follow normal denture procedures.



If the patient's ridge has resorbed and is thin causing the baseplate to be unstable, incorporate a minimum of two (non-hexed) temporary sleeves with screws into the baseplate. This creates a stable baseplate for an accurate bite-registration by the clinician.

Abutment Selection and Finishing the Final Prosthesis

This section will show the necessary steps for finishing the final prosthesis utilizing the Snap Abutment and the O-Ring Abutment. Each attachment has a different process for insertion of the nylon female into the Snap Abutment Assembly or the O-Ring Keeper and a block out procedure.

Step 3: Fabricate a silicone putty matrix around the labial portion of the denture wax-up. Doing so records the occlusals of the teeth and their position relative to the implants in the master cast.



Putty Matrix with Work Set-Up

Step 4: Measure the tissue height. Select the O-Ring or Snap Abutment that is approximately 1mm above the tissue. (One millimeter above tissue will allow the female of attachment to fully seat on the abutment without tissue interference.) Order the appropriate abutments.



Putty Matrix without Teeth

Step 5: Place the Snap or O-Ring Abutments on the model using an overdenture abutment driver. Hand tighten into place.



O-Ring Abutments Placed

Step 6: SEATING THE BRASS SPACER AND BLOCKING OUT OF THE SNAP ABUTMENT

Seat the Brass Spacer over the hex of the abutment. Then place the female Snap Abutment Assembly on top of the Brass Spacer. The Spacer will also serve as a block-out. If the Spacer is not used, use a block-out compound to block out the space between the Snap Abutment Assembly and the platform of the Snap Abutment. Try and close the flask while checking for any interferences with the denture teeth. If interferences occur, make the necessary adjustments.

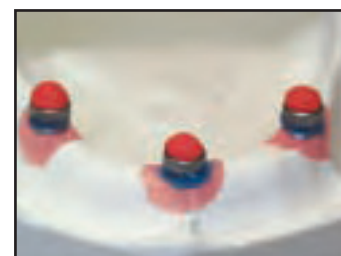


Snap Abutment Assembly with Block-out Component

OR

FOR BLOCK OUT OF THE O-RING ABUTMENT

Place the processing (RED) O-Ring into the O-Ring Keeper using a blunt instrument. Seat the O-Ring Keeper over the male attachments. The side of the O-Ring Keeper with the wider opening is placed facing down toward the tissue. Use a block-out compound or plaster to block out the space between the bottom of the O-Ring Keeper and the platform of the abutment. The top of the keeper should also be blocked out in a dome shape to allow for 1-2mm of space in the denture. Try to close the flask. Check for interference between the teeth and the attachments. If the denture teeth interfere, grind them as necessary to provide room for enough acrylic.



O-Ring Abutment Blocked Out



Do Not Trial Pack. Trial packing could dislodge the male portion from the abutment. Pack and cure the denture to the manufacturer's specifications. Finish the overdenture. Be careful not to damage the Ball Abutment Assembly or the O-Ring Retainers.

Step 7: Invest, following normal denture procedures.



A small metal mesh may be incorporated into the denture for added strength.

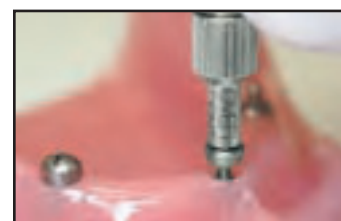
CLINICAL PROCEDURE

Delivering the Final Prosthesis

Step 1: Remove the patient's healing abutments one at a time using a .048" Hex Driver. Using the overdenture driver, place the appropriate abutments and hand tighten into place.



Placing O-Ring Abutments in the Mouth



Placing Snap Abutments in the Mouth



Due to tissue variations, abutments are not always the same cuff heights. Be sure to place the correct abutment in the correct implant site according to how they were placed on the master model.

overdenture restorations

Step 2: Using a 30Ncm Accu-Torque Wrench and an Overdenture Accu-Torque Driver, tighten the abutments into final position.



Verify that the lab has placed the black Clinical O-Rings for the O-Ring Abutment and not the red processing rings.

Step 3: Procedure for seating the final denture (female attachments have been processed into the denture by the laboratory):

1. Seat the final denture.
2. Make any final adjustments to the occlusion.
3. Instruct the patient about proper insertion and removal of the prosthesis, proper home care and hygiene.
4. Insertion instructions should include not biting the denture into place.
5. Instruct the patient to remove the prosthesis by lifting vertically when removing the denture.



Final Denture



Taking these precautions will help to extend the life of the nylon O-Rings or Snap Retention Inserts.

STEPS FOR REPLACING THE SNAP RETENTION INSERT:



Snap Abutments are packaged with a Snap Abutment Assembly (housing with a low retention insert) and a laboratory spacer. To replace a worn-out retention insert or if more retention is desired, perform the following steps:

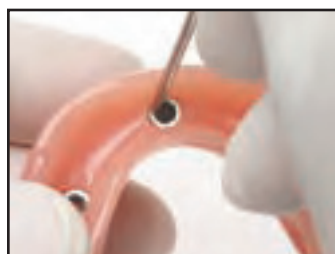
1. Use the Snap Insert Seating Tool to remove the retention insert.
2. Place the selected retention insert on the Seating Tool. Then with firm pressure, insert the Snap Retention Insert into the metal housing in the denture.



Snap Insert Seating Tool

STEPS FOR REPLACING THE CLINICAL O-RING:

1. Use a sharp instrument to pry out the existing clinical o-ring (black).
2. Use a blunt instrument to replace the clinical o-ring (black).



Removal of Existing Clinical O-Ring



Placement of Clinical O-Ring

ALTERNATIVE PROCEDURE:

The clinician may choose to place the male Snap Abutment or O-Ring Abutment and take a direct impression. If the patient has an existing denture, once the abutments have been placed, a soft tissue liner is used to fit the existing denture to the abutments.

CLINICAL PROCEDURE

Doctor Placement of the Snap or the O-Ring Abutment and Direct Impressioning



To obtain the proper cuff height, prior to abutment placement, remove the healing abutments. Use the tissue measuring gauge to measure the tissue depth.

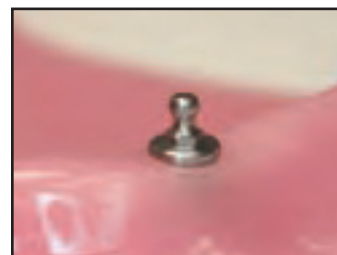
The abutment cuff should be at least 1mm above the tissue. This will keep the tissue from slumping onto the platform of the abutment, causing improper seating of the denture. Order the appropriate height Snap or O-Ring Abutments to ensure proper function of the restoration.



Tissue Measurement Gauge

Step 1: Remove the patient's healing abutments one at a time using a .048" Hex Driver. Using the overdenture driver, place the abutments. Hand tighten.

Step 2: Use an x-ray to verify that the abutments are completely seated. Final tighten the abutments using a 30Ncm Accu-Torque Wrench and the Accu-Torque Overdenture Driver.



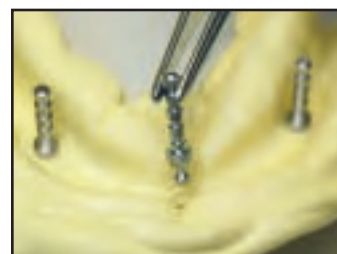
Proper Abutment Height

Step 3: Syringe impression material around the abutments. Then take a final impression using a medium-to-heavy body polyvinylsiloxane or polyether material.



Syringe Impression Material

Step 4: Inspect the impression for accuracy. Send the impression with the abutment analogs to the laboratory to fabricate a master model. Modify the patient's existing denture using a soft liner over the abutments.



Inspect Impression

overdenture restorations

LABORATORY PROCEDURE

Master Model Fabrication

Step 1: Seat the abutment analogs into the impression. Pour the master model.

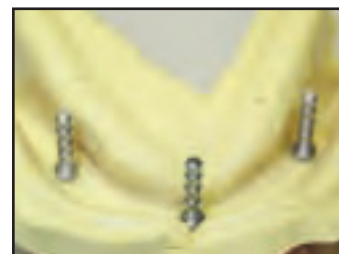
Step 2: Block out around the male analogs and fabricate a wax rim.



Laboratories may incorporate the Snap Abutment Assembly or the (red) processing O-Ring and Keeper into the denture base for stability during the wax rim and denture set-up try-in phase.



For the denture wax rim and try-in, follow traditional clinical and laboratory procedures.



Analogues in Impression

CLINICAL PROCEDURE

Delivering the Final Prosthesis

Procedure for seating the final denture (female attachments have been processed into the denture by the laboratory):

1. Seat the final denture.
2. Make any final adjustments to the occlusion.
3. Instruct the patient about proper insertion and removal of the prosthesis, proper home care and hygiene.
4. Insertion instructions should include not biting the denture into place.
5. Instruct the patient to remove the prosthesis by lifting vertically when removing the denture.



Taking these precautions will help to extend the life of the nylon O-Rings or Snap Retention Inserts.

STEPS FOR REPLACING THE SNAP RETENTION INSERT:



Snap Abutments are packaged with a Snap Abutment Assembly (housing with a low retention insert) and a laboratory spacer. To replace a worn-out retention insert or if more retention is desired, perform the following steps:

1. Use the Snap Insert Seating Tool to remove the retention insert.
2. Place the selected retention insert on the Seating Tool. Then with firm pressure, insert the Snap Retention Insert into the metal housing in the denture.



Snap Insert Seating Tool

bar attachment-retained overdentures

FABRICATION OF A BAR ATTACHMENT-RETAINED OVERDENTURE

In most cases, the patient perceives no esthetic difference between an implant attachment-retained overdenture and a bar attachment-retained overdenture. However, the patient can expect a more stable (less movement) and more expensive prosthesis with a bar attachment-retained overdenture. The chairside protocols for bar attachment-retained overdentures, using different attachment mechanisms (i.e. O-Rings, ERA Attachments, Ball Attachments, etc.) are virtually the same. The primary differences between these attachment mechanisms include: required interarch vertical space, angle correction capabilities, amount of retention they provide, and biomechanical advantages and disadvantages. There are three common abutment systems available for a bar attachment-retained overdenture: the UCLA Abutment, Fixed Detachable Abutment and the Standard Abutment Systems (also known as transmucosal abutments).



UCLA Abutment System



Fixed Detachable Abutment System



Standard Abutment System



Diagnostic Wax-up



Bar Attachment-Retained Overdenture

When the tissue depth exceeds 3mm, a transmucosal abutment is recommended to extend the seating platform of the metal framework to the abutment approximately 1.0mm to 1.5mm above the tissue height. This will allow better access for hygiene care. It is highly recommended that a full diagnostic set-up be completed prior to fabrication of any overdenture restoration. Typically, fabricating a new denture for the patient is required due to the limited ability to retrofit an existing denture to a metal bar.

bar attachment-retained overdentures

FABRICATION OF A BAR ATTACHMENT RETAINED OVERDENTURE

The UCLA Abutment System

TECHNICAL CONSIDERATIONS:

- A minimum interocclusal clearance of 4.5mm for SD and RD and 5.0mm for WD UCLA Abutments is required between the implant prosthetic table and the top of the abutment screw when seated.

CLINICAL PROCEDURE

Impressioning



For implant level impressions, refer to pages 6-10 in this Prosthetic Manual for an open tray or a closed tray impression technique.

LABORATORY PROCEDURE

Master Model Fabrication



If the implant analogs are subgingival, fabrication of a soft tissue model is recommended.

Step 1: Inspect the impression for accuracy.

Step 2: Pour the master model with a dental stone.

Wax Rim Fabrication

For the laboratory procedures of a wax bite rim fabrication, follow normal denture procedures.



If the patient's ridge has resorbed or is thin, incorporate a minimum of two (non-hexed) temporary abutments with abutment screws into the baseplate. This creates a stable baseplate resulting in a more accurate try-in by the clinician.



Since distortion in materials may occur and cause inaccuracies in the impression, a verification jig should be made for all multi-unit bar restorations.



Wax Rim with Temporary Sleeves

Verification Jig Fabrication

Step 3: Place the temporary abutments onto the master model and hand tighten using the long screws.



Temporary Abutments Placed



If the Fixed Detachable Abutments were placed, use the Fixed Detachable open tray impression post and long screws for the fabrication of a verification jig as shown or use temporary abutments as described in Step 4.



Fixed Detachable Impression Posts

Step 4: Intertwine the dental floss around the temporary abutments.



Intertwined Floss

Step 5: Apply a pattern resin or a light-cured material to the temporary abutments. Incorporate the dental floss and lute the abutments together.



Light-cured Material

Step 6: Section the pattern resin between the temporary abutments. Mark the temporary abutments for the mid-facial orientation and return them to the clinician individually or luted together in 2 by 2 sections.

bar attachment-retained overdentures

Step 7: Send the sectioned verification jig with the abutment screws to the clinician for try-in. A passive fit intra-orally will confirm that an accurate final impression has been achieved.

CLINICAL PROCEDURE

Interocclusal Record



For the clinical procedures of a wax bite rim try-in, follow normal denture procedures.



If the laboratory has incorporated temporary sleeves into the wax bite rim, remove the corresponding healing cap prior to try-in of the wax bite rim.

Step 1: Once the interocclusal record is completed, remove all the remaining healing abutments with a .048" Hex Driver to try-in the verification jig.

Step 2: Place the sectioned verification jig onto the implants and tighten the abutment screws firmly. Be sure to place the sections in the mouth in the same position as they were on the master model.



Facial Dots for Orientation



Sectioned Jig Placed in the Mouth

Step 3: Lute the sections together using a pattern resin or a light-cured material.



Luting of Sections

Step 4: Once the luted material has set, remove the abutment screws. Lift the luted verification jig from the mouth. There should be no binding or fracturing of the verification jig upon removal. This will confirm that a passive fit has been achieved.

Step 5: Replace the healing abutments and return the verification jig to the dental laboratory.



Completed Verification Jig

LABORATORY PROCEDURE

Denture Wax Set-up and Model Verification



For the laboratory procedures of a denture wax set-up, follow normal denture procedures.

Once the clinician has established a passive fit with the verification jig, the master model may need to be altered to the new relationship before the bar framework can be fabricated. Remove the soft tissue from the master model. Using a straight bur, remove the misaligned analog(s) from the master model. Attach the implant analog(s) to the verification jig. Soak the master model in water and then carefully vibrate stone into the voids around the flats of the implant analogs.



Completed Verification Jig

CLINICAL PROCEDURE

Denture Wax Try-in for the Patient

For the clinical procedures of a denture wax set-up for try-in, follow normal denture procedures.

LABORATORY PROCEDURE

Bar Fabrication

The bar fabrication, try-in and final process using the UCLA Abutment System is shown below. If the Fixed Detachable or Standard Abutments are used for fabrication of a bar attachment-retained overdenture, the bar fabrication, try-in and final processing procedures are the the same.

Step 1: Index the facial contours of the approved wax set-up with a putty or plaster matrix. This will provide a guide for bar positioning and attachment placement.



Matrix on Model

Step 2: Remove the matrix and the wax set-up from the master model. With an abutment screw and the UCLA Gold/Plastic Combo Sleeves (Non-Locking), secure the sleeves onto the implant analogs and hand tighten. Reduce the occlusal height of the sleeves to fit within the matrix of the denture set-up.



Sleeves Cut Down

bar attachment-retained overdentures

Step 3: Using a plastic bar pattern, cut a section of the bar pattern to fit between the implant sites. Adjust the height of the bar section so the bar height is even all the way across the top of the bar.

Step 4: Place the matrix back on the model. Use the matrix as a guide to provide adequate clearance for the attachments and their housings, bar pattern, teeth and acrylic thickness.



There are many different types of attachment mechanisms in various heights and diameters. Choose an attachment mechanism that will provide adequate thickness for the acrylic and enough room for the denture teeth.

Step 5: Connect the bar pattern to the Gold/Plastic Sleeves using wax or resin material. Use a rubber wheel to reduce the height of the waxing sleeves to 0.5mm above the top of the bar. Smooth out the wax-up to prepare for spruing.

Step 6: Sprue the pattern with 8/10-gauge wax with reservoirs. Use a high-heat, phosphate-bonded investment and follow the manufacturer's specifications for liquid/water/powder ratios, mixing times, etc.

Step 7: When divesting the framework, use of a chemical divesting material to maintain the integrity of the gold cylinder is recommended.

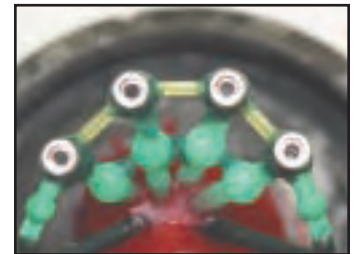


When polishing the interface between the implant and the prosthetic-connection, attach an implant analog to protect the abutment.

Step 8: Send the framework and the denture to the restoring doctor for try-in. Include the Abutment Screws.



Waxed Bar Pattern



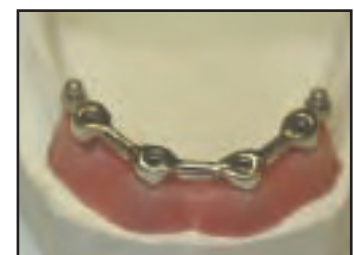
Sprued Bar on Base



Before

After

Chemical Divesting



Completed Bar

CLINICAL PROCEDURE

Framework Try-in

Step 1: Remove the healing abutments.

Step 2: Confirm that the bar framework seats passively.



Bar Framework Seated

Step 3: Beginning with the most distal abutment/implant, place the first abutment screw. Hand tighten the abutment screw. Make sure the abutment interface/connections on all the remaining implants are completely seated.



First Coping Screw Placed

Step 4: Continue placing the abutment screws around the arch. Verify the fit each time you place a screw.



Third Coping Screw Placed

Step 5: Once the bar framework is completely seated, follow the normal procedures for wax set-up evaluation.



Bar Completely Seated

Step 6: Remove the metal bar framework from the patient's mouth.

Step 7: Replace the healing abutments.

Sectioning Framework Procedure



If the framework does not seat passively, it must be cut and soldered/laser welded.

bar attachment-retained overdentures

Step 8: Mark the bar framework just before the first abutment that has lifted and is not seated on the abutment interface.

Step 9: Remove the metal framework from the patient's mouth



Sectioned Bar

Step 10: Section the metal framework where necessary and relate it in the mouth using a pattern resin or light-cure material.

Step 11: Remove the sectioned bar framework and replace the healing abutment.

Step 12: Return the luted bar framework and the master model to the laboratory for solder/laser weld.



Luted Sections



A non-passive fitting metal framework can sometimes cause the patient to feel pressure or a pulling sensation when the abutment screws have been tightened.

LABORATORY PROCEDURE

Processing

Step 1: Process using conventional denture techniques.

Step 2: Return the final restoration to the clinician for final insertion.

CLINICAL PROCEDURE

Final Insertion

Step 1: Remove the healing abutments using a .048" Hex Driver.

Step 2: Insert the bar framework and tighten the abutment screws using a 30Ncm Accu-Torque Wrench and .048" Accu-Torque Driver.



Final Prosthesis



Fastening screws and coping screws, which are used with transmucosal abutments, have a different torque value. Please refer to page 5 of this Manual for fastening and coping screws torque values.

Step 3: Seat the final overdenture and follow conventional procedures for the delivery of the final restoration.



Final Denture with Attachments

FABRICATION OF A FIXED DETACHABLE (HYBRID) RESTORATION

Fixed Detachable Abutment System

The Fixed Detachable Abutment System is commonly used for a Fixed Detachable (Hybrid) restoration. The Fixed Detachable Abutment's tapered design provides excellent stability and allows for an easier insertion path. The Fixed Detachable Abutment is commonly used in the maxilla because of its tapered walls. The abutment is available for the small diameter (SD) and the regular diameter (RD) implants in cuff heights of 2mm, 4mm and 6mm. For Wide Diameter (WD) implants, use of the Conical Abutment for fabrication of a Fixed Detachable (Hybrid) restoration is recommended.

TECHNICAL CONSIDERATIONS:

- The tapered 12 degree sidewall allows up to 24 degrees of divergence between adjacent abutments.
- A minimum interocclusal clearance of 6.9mm is required between the implant prosthetic table and the top of the coping screw for the Fixed Detachable Abutment.

The Standard Abutment System can be used as an alternative to the Fixed Detachable Abutment System. Due to the contours and trajectory of the bone found in the maxilla, the Standard Abutment is most commonly used in the mandible. For the Small Diameter (SD) and Wide Diameter (WD), use of the Conical Abutment for fabrication of a Fixed Detachable (Hybrid) restoration is recommended.

CLINICAL PROCEDURE

Abutment Placement and Impressioning

Step 1: Remove the healing abutments.

Step 2: Place the Fixed Detachable Abutments using the .062" Hex Driver.
Tighten with firm finger pressure.

Step 3: Take an x-ray to verify that the Fixed Detachable Abutments are completely seated.



Fixed Detachable Abutments Placed

fixed detachable restorations

Step 4: Torque the Fixed Detachable Abutments into place using a 30Ncm Accu-Torque Wrench and the .062" Torque Driver.



Applying Torque
(Normal wrench position)



Torque Applied
(Wrench head in release/broken position)

Step 5: Place the open tray or closed tray impression posts onto the Fixed Detachable Abutments. The impression taking techniques are no different than an implant level impression except the Fixed Detachable Abutment Impression Posts are placed directly on the Fixed Detachable Abutments. Please refer to pages 6-10 of this Manual for the open tray or closed tray Fixed Detachable impression techniques.



Fixed Detachable Impression Posts



Closed tray impression posts are available in one piece (non-hexed) for multi-unit restorations. The open tray impression posts are two pieces.

LABORATORY PROCEDURE

Master Model Fabrication

Step 1: Seat the Fixed Detachable Abutment Analogs and pour the master model in dental stone.



A soft tissue model is recommended if the Fixed Detachable Abutments are subgingival.

Wax Rim Fabrication

For wax bite rim fabrication laboratory procedures, follow normal denture procedures.



If the patient's ridge has resorbed or is thin, incorporate a minimum of two Fixed Detachable Plastic Sleeves with screws into the baseplate. This creates a stable baseplate resulting in a more accurate try-in by the clinician.



Wax Rim with Plastic Sleeves



Since distortion in materials may occur and cause inaccuracies in the impression, a verification jig should be made for all multi-unit restorations.



The clinician may fabricate a verification jig chairside prior to wax rim try-in.

Verification Jig Fabrication



For fabrication of a verification jig refer to the note after Step 3 on page 34 of the Bar Overdenture Section in this Guide.

CLINICAL PROCEDURE

Interocclusal Record

For wax bite rim try-in clinical procedures, follow normal denture procedures.



If the laboratory has incorporated plastic sleeves, remove the corresponding healing cap prior to wax bite rim try-in.

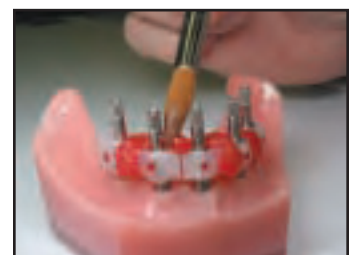
Step 1: Remove all the remaining healing caps with a .048" Hex Driver.

Step 2: Place the sectioned verification jig onto the Fixed Detachable Abutments and tighten the long screws firmly.

Step 3: Lute the sections together using a pattern resin or a light-cured material.



Sectioned Jig Placed in the Mouth



Luting of Sections

fixed detachable restorations

Step 4: Once the luted material has set, remove the long screws. Lift the luted verification jig from the mouth. There should be no binding or fracturing of the verification jig upon removal. This will confirm that a passive fit has been achieved.

Step 5: Replace the healing caps and return the verification jig to the dental laboratory.



Completed Verification Jig

LABORATORY PROCEDURE

Denture Wax Try-in and Model Verification

For denture wax set-up laboratory procedures, follow normal denture procedures.

Once the clinician has established a passive fit with the verification jig, the master model may need to be altered to the new relationship before the Fixed Detachable framework can be fabricated. Remove the soft tissue from the master model. Using a straight bur, remove the misaligned Fixed Detachable Abutment Analog(s) from the master model. Attach the implant analog(s) to the verification jig. Soak the master model in water and then carefully vibrate stone into the voids around the implant analog flats.

CLINICAL PROCEDURE

Denture Wax Try-in for the Patient

Follow normal denture procedures for try-in of a wax set-up.

LABORATORY PROCEDURE

Framework Fabrication

Step 1: Index the facial contours of the approved wax set-up with a putty or plaster matrix. Doing so will aid in positioning of the framework and placing of the screw access holes.



Matrix on Model

OPTIONAL METHOD FOR A MATRIX:

1. Place a separating medium onto the denture teeth.
2. Adapt a light-cure material over the teeth. (Place enough material over the teeth so the teeth will be stable in the material.)
3. Extend the light-cure material onto the retro molar pad area.
4. Place a strip of light-cure material from the incisal edge of the matrix down to the vestibule of the stone model.
5. Boil away the wax from the denture teeth.



Buccal View



Lingual View

Completed Matrix without Wax

Step 2: Fasten the Fixed Detachable Gold Sleeve and Waxing Pin. Tighten using a .048" Hex Driver.



If the waxing pin/screw access hole interferes with the matrix, relieve the matrix and the denture teeth to allow the waxing pins to seat properly into the gold sleeves.



Gold Sleeves and Waxing Pin

Step 3: Utilizing a preformed pattern (such as PC pattern from Attachments International), align the pattern over the implant sites.



Waxed PC Pattern with Jig

Step 4: Continue with the following procedure:

1. Mark the implant sites on the PC pattern and use a bur to cut holes.
2. Visually inspect to ensure that the PC pattern sits completely around the gold sleeves.
3. Reduce the width of the PC pattern to fit within the matrix. Shorten the distal extensions if necessary. The PC pattern should support all the teeth.
4. Connect the PC pattern to the gold sleeves.
5. Place retention beads and/or loops with a thin gauge wire wax on the occlusal of the PC pattern.



Waxed PC Pattern with Jig



Placing the PC pattern 2-2.5mm above the tissue is recommended. The under side of the PC pattern should be rounded for easy patient cleaning.

fixed detachable restorations

Step 5: Sprue the pattern with 8/10-gauge wax with reservoirs. Use a high-heat, phosphate-bonded investment and follow the manufacturer's specifications for liquid/water/powder ratios, mixing times, etc.



Sprued Bar on Base

Step 6: When divesting the framework, use of a chemical divesting material to maintain the integrity of the gold cylinder is recommended.



Before
After
Chemical Divesting



When polishing the interface between the implant and the prosthetic-connection, attach an implant analog to protect the abutment.

Step 7: Send the framework to the restoring doctor for try-in. Include the coping screws.



Completed Bar

CLINICAL PROCEDURE

Framework Try-in

Step 1: Remove the healing caps with an .048" Hex Driver.



Framework Seated

Step 2: Confirm that the framework seats passively.

Step 3: Beginning with the most distal implant/abutment, place the first coping screw. Hand tighten the coping screw. Make sure the abutment interface/connections on all the remaining implants are completely seated.



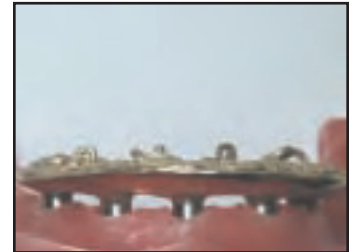
First Coping Screw Placed

Step 4: Continue placing the coping screws around the arch. Verify the fit of the remaining abutment interface/connection each time you place a coping screw.



Third Coping Screw Placed

Step 5: Once the framework is completely seated, verify that all abutment/framework interfaces are completely seated.



Framework Completely Seated

Step 6: Remove the metal framework from the patient's mouth.

Step 7: Replace the healing caps.

Sectioning Framework Procedure



If the framework does not seat passively, it must be cut and soldered/laser welded.

Step 8: Section the bar where necessary and relate it in the mouth using a pattern resin material.



Sectioned Framework



Luted Sections

Step 9: Remove the metal framework from the patient's mouth.

Step 10: Replace the healing caps. Return the luted framework and master model to the laboratory for solder/laser welding.



A non-passive fitting metal framework can sometimes cause the patient to feel pressure or a pulling sensation when the abutment/coping screws have been tightened.

LABORATORY PROCEDURE

Denture Wax Set-up and Model Verification

For denture wax set-up laboratory procedures, follow normal denture procedures.

fixed detachable restorations

Once the clinician has established a passive fit with the verification jig, the master model may need to be altered to the new relationship before the bar framework can be fabricated. Remove the soft tissue from the master model. Using a straight bur, remove the misaligned analog(s) from the master model. Attach the implant analog(s) to the verification jig. Soak the master model in water and then carefully vibrate stone into the voids around the implant analog flats.



Denture Wax Set-Up

CLINICAL PROCEDURE

Denture Wax Try-in for the Patient

Follow normal denture procedures for the try-in of wax set-up.



Denture Wax Try-In

LABORATORY PROCEDURE

Processing



Processing tips are as follows:

1. Place the waxing pins into the denture and attach an analog to the underside of the framework.
2. Tighten the waxing pin with finger pressure.
3. Pour a separate, new working model embedding the analogs for stability.
4. Block out under the framework using an appropriate material.

Step 1: Process using conventional denture techniques.

Step 2: Return the finished prosthesis to the clinician for the final insertion.



Buccal View



Lingual View

Finished Prosthesis

CLINICAL PROCEDURE

Final Insertion

- Step 1:** Remove the healing caps using a .048" Hex Driver.
- Step 2:** Seat the final fixed detachable prosthesis in the patient's mouth. Hand tighten the coping screws.
- Step 3:** If seating of the final denture is acceptable, use a 20Ncm Accu-Torque Wrench to apply the final torque to the coping screws.
- Step 4:** Follow conventional denture procedures for delivery of the final prosthesis. Seal the screw access channel in each abutment with cotton pellets and composite resin material to complete the contours of the restoration.



Final Prosthesis
(Buccal View)



Final Prosthesis
(Lingual View)



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