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Prosthetic Considerations
Pre-Posthetic Considerations
Sterilization

Introduction
The Prosthetic Manual is designed to aid clinicians in basic prosthetic procedures using Keystone Dental's STAGE-1 Single Stage Implant System. The STAGE-1 Single Stage Implant System is designed to simplify the implant procedure for both the patient and the clinician. The procedures and guidelines presented in this Manual are not a substitute for formal implant restoration training for the clinician and the dental laboratories. It is the responsibility of the clinician and dental laboratory 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.

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:

<table>
<thead>
<tr>
<th>Sterilization Table</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Autoclave: 121°C (250°F) 60 minute exposure / 40 minute dry time or 132°C (270°F) 40 minute exposure / 30 minute dry time. Do not exceed 140°C (~284°F). Always use the dry cycle.</td>
</tr>
<tr>
<td>2. Dry Heat: 60°C (140°F) 120 minutes (minimum). Do not exceed 170°C (338°F).</td>
</tr>
</tbody>
</table>

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.

Symbols Key
= Caution  = Note  = Tip

Keystone Dental, Inc.  866-902-9272 (U.S.A.)  1-781-328-3490 (International)  www.keystonedental.com
pre-prosthetic considerations & prosthetic tables

The STAGE-1 Regular Diameter (RDS) Implant Connection is compatible with all Straumann Regular Neck Ø4.8mm Implants.

The STAGE-1 Wide Diameter (WDS) Implant Connection is compatible with all Straumann Wide Neck Ø6.5mm Implants.

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

Accu-Torque Drivers
Keystone Dental offers Accu-Torque Drivers in several hex sizes and lengths. See the STAGE-1 Product Catalog for available sizes and lengths.

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 releases or “breaks”, do not tighten any further or the abutment/fastening screw may strip or break.

Keystone Dental offers Accu-Torque Drivers in several hex sizes and lengths. See the STAGE-1 Product Catalog for available sizes and lengths.

Keystone Dental, Inc.  866-902-9272 (U.S.A.)  1-781-328-3490 (International)  www.keystonedental.com
Cement-on Crown (COC) Abutment System

The COC Abutment is used when a cementable restoration is desired. These abutments are available in the Regular Diameter (RDS) and the Wide Diameter (WDS) prosthetic connection with 3 different heights of 4.0, 5.5 and 7.0mm to accommodate vertical requirements. Once the appropriate abutment height is selected, the Quick-Cap Impression System makes cement-retained restorations simple. Conventional crown and bridge techniques are applied for both clinical and laboratory procedures.

**TECHNICAL CONSIDERATIONS:**
- For use in single tooth or multi-unit (splinted) restorations.
- Choice of 4.0, 5.5 and 7.0mm heights minimizes the need for abutment preparation.
- Abutment walls are tapered at 6 degrees for increased crown retention.
- Torque recommendation - 30Ncm.

**Clinical Procedure**

**Abutment Selection and Placement**

**Step 1:** Remove the cover screw utilizing the .048” Hex Driver.

**Step 2:** Select the appropriate COC Abutment Try-ins for the RDS or WDS connection. (COC Abutment Try-in sets are color-coded and marked with an identifying letter for easy identification.)

**Step 3:** Select the appropriate height COC Abutment Try-in based on the following criteria:
- The try-in pin is placed to check the buccal/lingual position and to verify clearance in lateral/protrusive movements.
- Check the interocclusal space. There should be approximately 2mm of occlusal clearance for the metal and porcelain.

When placing try-ins, seat the pin fully into the implant and twist slightly. The try-in pin can then engage the implant.

When using try-in pins, tie a piece of floss through the hole as a precaution in case the try-in is dropped.
Step 4: After the proper try-in pin is selected, choose the color-coded COC Abutment that matches the try-in pin. (COC Abutments are color-coded and marked with an identifying letter for easy identification.)

Step 5: Using the COC Abutment Driver, align the black stripe of the driver with the flat of the COC Abutment.

Step 6: Verify the occlusal clearance. Tighten the COC Abutment utilizing a 30Ncm Accu-Torque Wrench and a RDS or WDS Accu-Torque Driver.

Impressioning Procedure Using the Quick-Cap

The Quick-Cap Impression System makes impression taking simple. The Quick-Cap precisely transfers implant and abutment positioning to the laboratory. In most cases it eliminates the need for retraction cord.

Step 1: If no modification of the abutment is needed, select the appropriate color-coded Quick-Cap Impression Cap. Locate the “Flat” inside the Quick-Cap. (Quick-Caps are color-coded to match the selected COC Abutment.)

Step 2: Align the flat of the Quick-Cap with the flat of the COC Abutment and press into place with finger pressure. The Quick-Cap engages the implant and abutment with a friction fit. Pull up lightly on the impression cap. If the cap offers resistance, it is fully seated. It is normal if the impression cap does not make an audible “click” during seating.

Do NOT twist the Quick-Cap. Pull up lightly on the impression cap. If the cap offers resistance, it is fully seated.

Step 3: Syringe impression material around the Quick-Cap. The Quick-Cap should be completely covered.

Step 4: Fill the custom tray with impression material and seat the custom tray. (Follow the manufacturer’s specifications for impression material setting times.)

Step 5: Remove the impression and verify for accuracy.

Step 6: Send the impression, opposing model, bite registration and color-coded COC Analog (optional) to the laboratory for crown fabrication. (Analogs are color-coded and marked with an identifying letter for easy identification.)

Placement of the Temporary/Healing Cap

Temporary/Healing Caps are available for all Quick-Abutments and may be utilized in two different ways. They are provided sterile and are manufactured out of acrylic (polymethylmethacrylate). This material will bond to all leading dental composite/acrylic used in the dental office.
TEMPORIZATION PROCEDURE - OPTION 1
Use as a Healing Cap

If a temporary restoration is not being fabricated, the Temporary/Healing Cap can be used to cover the COC Abutment while the restoration is being fabricated.

The Healing Caps may not be re-sterilized and are designed for short-term use only.

Step 1: Select the appropriate size Healing Cap for the COC Abutment.

Step 2: Place the Healing Cap with a minimal amount of temporary cement for retention onto the COC Abutment.

Take a post-operative X-ray to verify that no excess cement may have remained in the incision.

TEMPORIZATION PROCEDURE - OPTION 2
Use as a Temporary Cap

Step 1: Using a model poured in dental stone, place a denture tooth in the edentulous area and fabricate a vacuum-formed splint using .020 splint material. The Temporary Cap is used as a foundation for temporary acrylic to bond to. Create a temporary restoration using the method of choice by bonding acrylic to the PMMA Temporary Cap.

The following are two of the most common techniques:

Vacuum-formed Stent Technique:

1) Using a diagnostic model, place denture teeth in the edentulous area and then fabricate a vacuum-formed splint using .020 splint material. The Temporary Cap is used as a foundation for temporary acrylic to bond to. Create a temporary restoration using the method of choice by bonding acrylic to the PMMA Temporary Cap.

2) Trim the stent so it fits nicely over the edentulous implant area with the Temporary Cap in place and seats onto the adjacent teeth.

3) Place the temporary acrylic material of choice into the splint and insert it over the patient’s adjacent teeth. (Follow manufacturer’s recommendations for curing times.)

4) Remove the splint and separate it from the acrylic temporary.

5) Adjust the acrylic for optimum emergence and contour.

6) Adjust the bite so it is out of occlusion and polish the temporary restoration. Protect the abutment screw from cement by filling in the abutment screw access hole(s) with an FDA-cleared removable material.

7) Apply a minimal amount of temporary cement to the temporary crowns and place them onto the implants. Care must be taken to avoid contaminating the surgical site with cement.

Take a post-operative X-ray to verify that no excess cement may have remained in the incision.

Temporary Shell Crown Technique:

1) Select the appropriate shell that fits over the Temporary Cap and adjust if needed.

2) Using the material of choice, fill the shell crown with acrylic and insert it over the implant/healing cap into the required position. (Follow the manufacturer’s recommendations for curing times.)

3) Adjust the acrylic for optimum emergence and contour.

4) Adjust the bite so it is out of occlusion and polish the temporary restoration.

5) Protect the abutment screw from cement by filling in the abutment screw access hole(s) with an FDA-cleared removable material. Fill the remaining portion of the screw access hole with composite.

6) Apply a minimal amount of temporary cement to the temporary crowns and place them onto the implants. Care must be taken to avoid contaminating the surgical site with cement.

Take a post-operative X-ray to verify that no excess cement may have remained in the incision.

Use a COC Abutment Analog for accurately finishing the margins.

Laboratory Procedure
Pouring the Master Model

Step 1: Inspect the impression for accuracy. If Quick-Cap impression components were used, check to make sure they are secure in the impression. Align the flat of the analog with the flat of the Quick-Cap and press-to-place with firm finger pressure.

If the COC Abutment Analog was not sent with the impression, select the correct COC Abutment Analog. (COC Abutments are color-coded and marked with an identifying letter for easy identification.)

If the margins of the implant are subgingival, pouring a soft tissue model is recommended.

If the doctor has taken an impression with the Quick-Cap and then determines that modification of the COC Abutment is necessary, a second Quick-Cap can be placed onto the unmodified COC Abutment. Then, reduction to the abutment and the Quick-Cap can be made for an ideal restoration. The second Quick-Cap is used as a reduction coping for the laboratory.
Step 2: If the abutments have been modified, evaluate the impression for a detailed replication of the margin and contours of the abutment. Pour the impression using a hard die stone or epoxy. Follow normal laboratory procedures for fabrication the final restoration.

Use of die spacer is recommended when the COC Abutment(s) have been modified.

Fabrication of the Restoration

Step 1: Select the appropriate prefabricated plastic sleeve(s). Use a locking plastic sleeve for a single tooth restoration. Use a non-locking plastic sleeve for a multi-unit (splinted) restoration.

If the COC Abutment does not provide enough clearance for 2mm of metal and porcelain, please refer to pages 14-15 for instruction on how to use the Quick-Cap as a reduction coping.

Step 2: Place the prefabricated plastic sleeve(s) onto the abutment analog. Use light finger pressure to snap the plastic sleeve over the shoulder of the abutment analog. Shorten the plastic sleeve according to the height of the COC Abutment.

Step 3: Wax directly onto the plastic sleeve, sprue, invest and cast the wax coping using normal crown and bridge techniques.

Optional Direct Wax Technique: If waxing directly to a COC Abutment Analog is desired, it is recommended that a die spacer be applied, as with any traditional crown and bridge die, to provide space for the cement. Keystone Dental COC Abutment Analogs are sized identically to the COC Abutments that are placed clinically.

Step 4: After the metal understructure is removed from the casting ring, cleaning the investment with a chemical divesting material is recommended. The small lip of extension at the margin must be removed before the cast coping is placed on the abutment analog.

Step 5: Once the lip is removed, finalize the margins and finish the remainder of the understructure using traditional crown and bridge techniques. If it is a multi-unit restoration, a metal try-in is recommended.

Clinical Procedure
Metal Framework Try-in

Step 1: Remove the temporary prosthesis or healing caps. Clean the excess cement around the COC Abutment and collar of the implant.

Step 2: Seat the metal framework. Make sure the framework seats passively without any binding.

Step 3: Return the framework to the laboratory for final fabrication.

If the framework binds as it is seated or does not go completely down to the margin, then the bridge is not passive and must be cut. 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 remove the framework from the mouth. Use a disc to section the framework thereby creating a gap of approximately .3mm. Seat all the sections of the framework in the mouth. Using a pattern resin material, lute the sections together. Once the material has set to the manufacturer's specifications:

1) Return the framework to the laboratory to be soldered.

OR

2) Pick up the luted framework in a secondary full arch impression and return it to the laboratory for soldering and porcelain application.

Step 2: If the abutments have been modified, evaluate the impression for a detailed replication of the margin and contours of the abutment. Pour the impression using a hard die stone or epoxy. Follow normal laboratory procedures for fabrication the final restoration.

Optional Direct Wax Technique: If waxing directly to a COC Abutment Analog is desired, it is recommended that a die spacer be applied, as with any traditional crown and bridge die, to provide space for the cement. Keystone Dental COC Abutment Analogs are sized identically to the COC Abutments that are placed clinically.
LABORATORY Procedure
Porcelain Application

Place the opaque layer and porcelain following normal laboratory procedures.

Keep the occlusal tables small (like on a pontic). Avoid any excessive contacts and only light contact in centric occlusion of the implant restorations.

Clinical Procedure
Final Insertion

Step 1: Remove the temporary prosthesis from the patient’s mouth. Check that the temporary cement is completely removed from the abutment and the collar of the implant. Seat the restoration. 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 is needed.

If the laboratory modified the abutment using the Quick-Cap as a reduction coping, prior to placing the final restoration, follow these steps:

1) Remove the temporary healing cap or temporary crown from the COC Abutment.
2) Remove any excess cement around the COC Abutment and the implant collar.
3) Seat the Quick-Cap (reduction coping) with the flat of the reduction coping engaging the flat of the COC Abutment.
4) Use either a carbide or diamond bur to reduce any part of the COC Abutment that is protruding through the “window” of the reduction coping.

Use copious amounts of water when preparing the COC Abutment in the mouth.

Step 2: Once the reduction has been completed, remove the Quick-Cap (reduction coping) and follow normal crown and bridge techniques to seat the final restoration.

CLINICIAN MODIFICATION OF THE COC ABUTMENT

Clinical Procedure
Modification of the COC Abutment

When the COC Abutment is placed chairside, the clinician can take an impression utilizing the Quick-Cap before any modification of the COC Abutment is completed. Then, by utilizing a second Quick-Cap as a reduction coping, modification of the COC Abutment can be achieved, and the patient is able to leave the office with a temporary crown. The modified Quick-Cap (reduction coping) will be sent to the laboratory. This procedure saves valuable charttime for the clinician and the patient.

For chairside procedures on the selection, placement and impression of a non-modified COC Abutment, refer to the Cement-on Crown Abutment section found on pages 6-8.

Step 1: Select a second Quick-Cap. Then, use a cut-off disc to remove the top section of the Quick-Cap.

Step 2: Place the Quick-Cap onto the COC Abutment and verify stability for complete seating. Use a high-speed handpiece and a coarse diamond or carbide bur to remove the necessary Quick-Cap material. While the Quick-Cap is still in place, reduce the COC Abutment to the correct height and contour for an optimal final restoration.

Check the interocclusal and proximal space. There should be approximately 2mm of space between the opposing occlusion in both lateral/protrusive movements and the adjacent teeth to allow enough room for the metal and porcelain.

Step 3: Send the modified Quick-Cap (reduction coping), along with the full arch impression, opposing model, matching color-coded COC Abutment Analog (replica of the COC Abutment) and bite registration to the laboratory.
LABORATORY MODIFICATION OF THE COC ABUTMENT

Laboratory Procedure
Modification of the COC Abutment

Utilizing the Quick-Cap as a reduction coping saves the laboratory time and money, because the laboratory does not have to fabricate a separate reduction coping when modification of the COC Abutment is needed. Stability of the reduction coping provides the clinician maximum convenience and an optimal clinical result when the COC Abutment is modified.

Step 1: Inspect the impression for accuracy.

Step 2: If the clinician did not send the COC Abutment Analog, select the correct color-coded COC Abutment Analog.

Step 3: Insert the appropriate COC Abutment Analog into the impression, carefully aligning the flat of the COC Abutment Analog with the flat of the Quick-Cap. Then press-to-place using firm finger pressure.

When seating the COC Abutment Analog, do NOT twist the Analog. Verify seating by pulling up lightly on the analog. If the analog offers resistance, it is fully seated. It is normal if the analog does not make an audible “click” during seating.

If the margins are subgingival, pouring a soft tissue model is recommended.

Step 4: Once the soft tissue model has been poured, remove the Quick-Cap from the impression. Using a cut-off disc, remove the top portion of the Quick-Cap. Place the Quick-Cap onto the COC Abutment Analog in the master model.

Step 5: The Quick-Cap can be reduced by using a carbide bur or a heatless stone. Once the Quick-Cap is placed, reduce the COC Abutment Analog to allow for 2mm of metal and porcelain for the restoration. Reduce the proximal contact from the adjacent teeth for an optimal esthetic restoration.

Step 6: Once the proper reduction has been completed, remove the Quick-Cap (reduction coping). Then fabricate the final restoration using traditional crown and bridge techniques.

Use of a die spacer is recommended when the COC Abutment(s) have been modified.

Angled Cement-on Crown (COC) Abutment

STAGE-1 Cement-on Crown (COC) Angled Abutments provide a simple method of fabricating single or multi-unit (splinted) cement-on crown (COC) restorations when the patient’s bone geometry does not allow for implants to be placed in an optimal position. In addition, the combination of a titanium nitride coated screw and an internal locking Morse Taper connection virtually eliminates screw loosening. The COC Angled Abutments are available for STAGE-1 Implants with the Regular Diameter (RDS) Prosthetic Connection.

TECHNICAL CONSIDERATIONS

- Used with Regular Diameter (RDS) STAGE-1 Implants.
- For use in single or multiple unit (splinted) restorations.
- COC Abutment is impressioned directly using conventional crown and bridge impression techniques.
- Required tooling: .048” Hex Driver
- Torque Recommendations: 30Ncm

Clinical Procedure
Placement of COC Angled Abutment

Step 1: Remove the cover screw from the implant using a .048” Hex Driver. Place the Angled Abutment Try-in (15º or 20º) into the implant to determine the proper angle correction needed. After selecting the appropriate abutment, place the abutment utilizing a .048” Hex Driver. If the abutment does not require modification, tighten the abutment screw using a 30Ncm Accu-Torque Wrench and a .048” Accu-Torque Driver.

Modification to the height, buccal/lingual and/or mesial/distal contours may be performed intra-orally using copious amounts of water. Once the final modifications have been made, torque the abutment screw with a 30Ncm Torque Wrench and a .048” Accu-Torque Driver.

Step 2: Block out the screw access hole with a retrievable material. Take a final impression of the Angled Abutment. If the margin is subgingival, use of retraction cord may be necessary to expose the margin.

Fabrication of Temporary Restorations

Step 1: For fabrication of a temporary restoration, take the impression as described above. Follow conventional crown and bridge techniques for the fabrication of a temporary restoration for the COC Angled Abutment.
Clinical Procedure
Abutment Selection and Placement

Step 1: Remove the cover screw with a .048" Hex Driver.

Step 2: Select the appropriate RDS or WDS Custom Prep Abutment to match the implant prosthetic connection.

Step 3: After selecting the appropriate abutment, use a .048" Hex Driver to engage the internal hex of the abutment and hand-tighten the abutment into the implant.

Step 4: If bulk preparation is needed, skip to the Bulk Preparation Procedure, Step 5.
OR
If general preparation is needed, skip to the General Preparation Procedure, Step 9.

Custom Prep Cement-on Crown (COC) Abutment

The Custom Prep COC Abutment is used for single or multi-unit cement-retained restorations. The contoured design of this prepable abutment provides custom angle correction up to 25 degrees. The Custom Prep Abutment is available in a 7.0mm height for the Regular Diameter (RDS) prosthetic connection and a 5.5mm height for the Wide Diameter (WDS) prosthetic connection.

TECHNICAL CONSIDERATIONS:

- "Barrel" shaped geometry provides additional bulk in the midsection where the strength is needed while gently curving inward to minimize abutment preparation.
- Horizontal line provides visual reference to the top of the internal .048" hex location during preparation.
- 1mm of straightwall prior to the flare reduces undercuts and the need for preparation near the implant collar.
- One-piece design engages the locking Morse Taper of the STAGE-1 Implants for single or multi-unit restorations.
- CP3 Titanium for easy abutment modification.

Laboratory Procedure
Master Model and Final Restoration

Step 1: Fabricate the wax coping pattern using traditional crown and bridge techniques.

Step 2: Sprue, invest and cast the waxed understructure using conventional crown and bridge techniques. After the metal understructure has been removed from the casting ring, cleaning the investment with a chemical divesting material is recommended.

Step 3: Apply the opaque layer and porcelain following conventional crown and bridge techniques.

Clinical Procedure
Final Restoration

Step 1: Remove the temporary prosthesis from the patient’s mouth. Check that the temporary cement is completely removed from the abutment and the collar of the implant. Place the final restoration onto 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.

Final Restoration in the Mouth
**Bulk Preparation Procedure**

**Step 5:** Once the abutment has been fully seated, determine how much material must be removed from the top of the abutment to accommodate the vertical requirements (approximately 2mm) and interproximal clearance of 1-2mm. If bulk preparation is needed, mark the contours on the abutment using an indelible marker to identify areas where reduction is needed.

When prepping subgingival, always use a diamond bur. Carbide burs may cause damage to the soft tissue.

**Step 6:** Use a .048” Hex Driver to remove the Custom Prep Abutment from the mouth.

**Step 7:** Using the Implant Analog as an abutment holder, modify the abutment using a high-speed handpiece and bur to achieve the desired height and contour.

**Step 8:** Place the prepared abutment in the mouth. Tighten using a 30Ncm Accu-Torque Wrench with a .048” Torque Driver. Proceed to Step 11.

**General Preparation Procedure**

**Step 9:** Place the abutment in the mouth. Tighten using a 30Ncm Accu-Torque Wrench with a .048” Torque Driver.

**Step 10:** Once the abutment has been torqued in place, use a high-speed handpiece and a coarse diamond bur to make any final modifications necessary to achieve the desired contours and emergence for the final restoration.

Use copious amounts of irrigation when performing in-mouth abutment preparation. All undercuts MUST be removed during abutment preparation to ensure a clear path of insertion for the restoration.

The following are suggested burs for prepping titanium in the mouth.

**Bulk Preparation** - FG 557 bur, FG 702 bur and FG 703 bur.

**General Preparation** - Coarse Diamond Burs

**Step 11:** Take the final impression using conventional crown and bridge techniques and materials when impressioning the seated Custom Prep Abutment. This may include the use of retraction cord if the margins are subgingival, bite registration and temporization of the restoration.

**Step 12:** Send the impression, opposing model, bite registration, shade, etc. to the laboratory.
Clinical Procedure
Abutment Placement

Step 1: Remove the Cover Screw from the implant using a .048” Hex Driver.

Step 2: Insert the .062” Hex Driver (or ITI System Octa Abutment Driver) into the hex in the top of the Indexed Abutment. Then seat the abutment into the implant and hand-tighten.

Step 3: Verify the seat of the abutments. Tighten them using a 30Ncm Torque Wrench.

Impressioning

For the “open-tray” impression technique or the “closed-tray”technique to the Indexed Abutment, please refer to pages 26-28.

Indexed Abutment for Angle Correction (For Cement-Retained Restorations)

Due to the trajectory of the bone, the most common need for angle correction is seen in the anterior maxilla. By placing an Indexed Abutment, impressioning and custom fabricating an angled abutment in the laboratory, improved function and esthetics may be achieved.

Clinical Procedure
Abutment Placement

Step 1: Remove the Cover Screw from the implant using a .048” Hex Driver.

Step 2: Insert the .062” Hex Driver (or ITI System Octa Abutment Driver) into the hex in the top of the Indexed Abutment. Then seat the abutment into the implant and hand-tighten.

Step 3: Verify the seat of the abutments. Tighten them using a 30Ncm Torque Wrench.

Impressioning

For the “open-tray” impression technique or the “closed-tray”technique to the Indexed Abutment, please refer to pages 26-28.

Laboratory Procedure
Pouring the Master Model

Pour the impression using a hard die stone or epoxy. Pin and cutout the Custom Prep COC Abutment die following conventional crown and bridge techniques.

Fabrication of the Restoration

Step 1: Fabricate the wax framework pattern using traditional techniques.

When waxing the framework, using a die spacer on the die and keeping the spacer short of the margins is recommended. The framework should follow normal prosthodontic criteria. Keep in mind that the actual size of a final posterior crown will be smaller buccal-lingually than the normal tooth or teeth the restoration is replacing to help minimize any excursive contacts.

Step 2: Sprue, invest and cast the wax pattern using traditional techniques.

After the metal coping is removed from the casting ring, cleaning the investment with a chemical divesting material is recommended.

If it is a multi-unit restoration, a metal try-in is recommended.

Final Restoration

Place the opaque layer and porcelain following normal crown and bridge procedures.

Clinical Procedure
Final Insertion

Remove the temporary prosthesis from the patient’s mouth. Verify that the temporary cement is completely removed from both the abutment and the implant collar. Place the final restoration. 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 is needed.

Laboratory Procedure
Pouring the Model

If the margins are subgingival, pour a soft tissue model. Syringe the soft tissue material around the analogs until it is about 2-3mm thick. Do not cover more than 25% of the analog with the soft tissue material or you may have insufficient retention of the analog in the solid portion of the model.

Final Restoration

Place the opaque layer and porcelain following normal crown and bridge procedures.

Final Insertion

Remove the temporary prosthesis from the patient’s mouth. Verify that the temporary cement is completely removed from both the abutment and the implant collar. Place the final restoration. 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 is needed.
Custom Abutment Fabrication

Step 1: Attach a Locking Indexed Abutment Sleeve, either gold or plastic, to the analog in the model using an Indexed Abutment Fastening Screw and a .048" Hex Driver.

When utilizing the Gold Sleeve, use the Indexed Abutment Waxing Pin to extend the occlusal height.

Step 2: Use a bur and/or a rubber wheel to reduce the sleeve as needed to conform to the contour of the adjacent dentition.

Step 3: Use wax to create the desired margins and shape. Leave enough occlusal clearance (approximately 2mm) for the fabrication of the final restoration.

Investing Procedure

Step 1: Use a fine grain investment and follow the manufacturer’s recommendations for liquid/water/powder ratios, mixing times, etc.

When casting to gold, do not use a debubblizer. As an alternative, rinse off the wax-up with clean water and blow dry with oil-free air.

Step 2: Pour the investment slowly into the ring on a vibrator. Watch for the investment to flow up through the screw access hole.

Burnout and Casting

Follow the alloy manufacturer’s recommendations.

Divesting Procedure

When divesting, do not sandblast the interface between the custom abutment and the implant. Use a chemical divestor. Sandblasting will remove material and possibly distort the fit.

Metal Finishing Procedure

Step 1: Fit the casting to the Indexed Abutment Analog using magnification to detect any imperfections in the interface.

Use a separate analog for finishing the angled component. Rotational movement of the sleeve on the abutment must be minimal.

Step 2: Once the fit of the casting has been verified, grind off the sprue and complete the finishing procedure. The screw access hole must be free of any bubbles. Mark the mid-facial of the abutments and on the model to indicate the correct positioning in the mouth. If multiple abutments are being used, be sure to indicate which abutment goes into which implant site (first abutment one dot, second abutment two dots, etc.). Leave the preparation portion of the casting rough for retention and polish any exposed custom abutments below the margin.

Attach an analog during the polishing procedure to protect the abutment/implant interface.

Crown Fabrication

Once the abutment is completed, a coping is fabricated over the abutment using conventional crown and bridge procedures.

Use Durallay® (Reliance Dental Manufacturing) or Patten Resincs® (GC America, Inc.) material or the equivalent to make the initial coping. Add wax. This will result in better adaptation to the abutment. Block out the screw access hole prior to making the coping.
Clinical Procedure
Custom Abutment Insertion

Step 1: Note the orientation marks on the model and the Custom Abutment. The Custom Abutment must be in the same position in the mouth as on the model.

Step 2: Remove the temporary or Healing Cap from the patient.

Step 3: Position the Custom Abutment in the patient’s mouth using the .048” Hex Driver to thread the fastening screw into the Indexed Abutment.

Step 4: Hand tighten.

Step 5: Tighten the retaining screw using a 20Ncm Torque Wrench.

Step 6: All Keystone Dental STAGE-1 Indexed Abutments are supplied with an occlusal plug for filling the screw access hole upon completion. The concave end of the plug is placed towards the occlusal. After adjusting the height (leave approximately 1-2mm of space for the composite), place the plug into the screw access hole and fill the top portion of the hole with composite. Use wax or block out compound in place of the occlusal plug if the interocclusal height of the cast angled portion is too diminished for the prepackaged occlusal plug.

Cementation of the Restoration

Final insertion of the restoration is done following conventional crown and bridge techniques.

If retrievability is desired, use temporary cement.

Indexed Abutment System

The Indexed Abutment is used for screw-retained restorations and for fabrication of custom abutments if angle corrections are needed. It may be utilized for crown and bridge and bar attachment-retained overdentures. The Indexed Abutment is available for the RDS and WDS STAGE-1 Implants.

Clinical Procedure
Abutment Placement

Step 1: Remove the Cover Screw from the implant using a .048” Hex Driver.

Step 2: Place the Indexed Abutment on a .062” Hex Driver (or Straumann System Octa Abutment Driver). Seat the Indexed Abutment into the implant and hand tighten. (RDS Indexed Abutment and components are shown).

Step 3: Verify the abutments are seated and tighten using a 30Ncm Torque Wrench.

Impressioning

Keystone Dental’s innovative three-piece Indexed Abutment Impression Post design facilitates the registration of highly accurate impressions using either open tray (direct) or closed tray (indirect) techniques.

Each package includes an impression post body and a long and short screw. The long screw is designed for use with the open tray technique and the short screw is used with the closed tray technique. Take a full arch impression using either a custom or a stock tray.

Open Tray (Direct) Technique

Step 1: Fabricate a custom tray. The top of the tray must be cut out in the areas opposing the implants. The long impression post screw must extend through the tray.
Step 2: Insert the long screw into the Indexed Abutment Impression Post body and partially engage the screw threads into the Indexed Abutment. Rotate the body of the Impression Post until it drops over the octagon of the Indexed Abutment. Hand tighten the impression post screw.

Impression Post Assembly

Step 3: For subgingival margins, take an x-ray to verify that the impression post is completely seated.

Impression Posts Seated

Step 4: Try in the impression tray with the impression posts in place. The screws should extend through the tray at least 2-3mm. Modify the tray as needed.

Step 5: Use of wax to block out the hex on the top of the screws is optional. It will help to locate the top of the impression screw(s).

Step 6: Carefully syringe impression material around the Impression Post body. Leave the upper portion of the long screw exposed, ensuring at least 2mm of the screw is free from impression material.

Impression Tray Try-in

Step 7: Fill the impression tray and completely seat the tray over the Impression Posts. Wipe any excess material off of the screw heads before the impression material sets.

Impression Posts Seated

Step 8: After the impression material has set, use a .048" Hex Driver to remove the screws. Remove the tray from the patient’s mouth. Evaluate the impression for accuracy. Check for any voids and verify that the impression post is securely locked into the impression material. Attach an Indexed Abutment Analog to the impression post by tightening the screw from the top of the impression tray. Send the impression, opposing model and the impression posts to the laboratory for model fabrication.

Closed Tray (Indirect) Technique

Step 1: Try in the impression tray.

Step 2: Using a .048" Hex Driver, insert the short screw into the Impression Post. Engage the threads of the screw into the Indexed Abutment. Rotate the body of the Indexed Impression Post until it drops over the octagon of the abutment.

Step 3: For subgingival margins, take an x-ray to verify that the impression post is completely seated.

Step 4: Try in the tray with the impression posts in place.

Step 5: Use wax to block out the hex in the top of the screw. Carefully syringe impression material around the impression post and completely cover with impression material.

Step 6: After the impression material has set, remove the tray from the mouth. The Impression Posts will remain attached to the abutments. Remove the wax with an explorer. Then remove the impression posts using a .048" Hex Driver. Attach an Indexed Abutment Analog to each impression post and re-insert back into the impression. Carefully align the flats on the impression post with the flats in the impression.

Step 7: Send the impression, impression posts and bite registration to the laboratory for model fabrication.

Placement of the Indexed Abutment Healing Cap

After impressioning, place an Indexed Abutment Healing Cap using a .048" Hex Driver. Leave it in place until the patient’s next appointment or construct a custom temporary restoration. (See Temporization on the following page.)
Temporization

Step 1: Place the appropriate Indexed Abutment Temporary Sleeve (Locking for single tooth, Non-locking for multi-unit) onto the Indexed Abutment. Tighten the Indexed Abutment Screw with a .048" Hex Driver. Remove the sleeve to customize the height of the temporary sleeve as needed.

Step 2: Once adjustments are made, replace the temporary sleeve and fill the screw access hole(s) with wax to prevent acrylic from filling in the hex of the screw.

Step 3: Fabricate the temporary restoration using traditional crown and bridge techniques.

Fabricate the Restoration

Waxing Procedure

Step 1: Select the desired waxing sleeve, either pre-machined gold or plastic castable and locking for single tooth, or non-locking for a multi-unit restoration.

Step 2: Attach the waxing sleeve(s) to the model using an Indexed Abutment Screw and a .048" Hex Driver.

When utilizing the gold sleeve, use the Indexed Abutment Waxing Pin to extend the occlusal height.

Step 3: Shorten the sleeves to clear the opposing dentition and proceed to fabricate the wax-up.

Step 4: After the wax-up is completed, sprue using either the direct or indirect technique. Position the “chimney” perpendicular to the base of the ring to allow the investment to flow up through the screw access hole.

Investing Procedure

Step 1: Use a fine grain investment and follow the manufacturer’s recommendations for liquid/water/powder ratios, mixing times, etc.

Step 2: Pour the investment slowly into the ring on a vibrator. Watch for the investment to flow up through the screw access hole.

When casting to gold, do not use a debubblizer. As an alternative, rinse off the wax-up with clean water and blow dry it with oil-free air.

Burnout and Casting

Follow the alloy manufacturer’s recommendations.

Divesting Procedure

When divesting, do not sandblast. Use a chemical divestor. Sandblasting will remove material and possibly distort the fit. After divesting, attach an abutment analog and glass bead at low pressure, if needed.
Clinical Procedure
Framework Try-In

Step 1: Evaluate the framework for passivity and margin adaptation. If the framework is not passive, section and relate it in the mouth with resin material.

Step 2: Return the indexed framework to the laboratory for soldering and have another metal framework try-in or proceed with porcelain application. Once a passive fit is verified, return to the laboratory.

Laboratory Procedure
Soldering Procedure

The framework should seat passively on the model. If the framework does not seat properly, it must be cut and soldered/laser welded. To stabilize the framework in the soldering investment, attach Indexed Abutment Analogs to the framework using a bur attached to the framework with sticky wax.

Porcelain Application

Apply porcelain using conventional crown and bridge techniques. Be careful not to get porcelain into the screw access hole or onto the abutment/implant interface.

Clinical Procedure
Final Insertion

Step 1: After porcelain application, evaluate the proximal contacts, contours, esthetics and occlusion.

Step 2: Tighten the Indexed Abutment Fastening Screw(s) using a 20Ncm Torque Wrench.

Step 3: All Keystone Dental STAGE-1 Indexed Abutment Sleeves are supplied with an occlusal plug for filling the screw access hole upon completion. The concave end of the plug is placed towards the occlusal surface. After adjusting the height (leave approximately 1-2mm of space for composite), place the plug into the screw access hole and fill the top portion of the hole with composite.

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.

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.

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.

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.
Indexed Abutment System
Bar Attachment-Retained Overdentures

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 inter-arch vertical space, angle correction capabilities, amount of retention they provide, and biomechanical advantages and disadvantages. The Indexed Abutment can be used for bar overdenture restorations.

Clinical Procedure
Abutment Placement

Step 1: Remove the Cover Screw from the implant using a .048” Hex Driver.

Step 2: Place the Indexed Abutment on a .062” Hex Driver (or Straumann System Octa Abutment Driver). Then place the abutment into the implant and hand tighten.

Step 3: Verify the seat of the abutments and tighten using a 30Ncm Torque Wrench.

Impressioning

For the “open tray” impression technique or the “closed tray” technique, please refer to pages 26-28.

Laboratory Procedure
Wax Rim Fabrication

Position a light-curing baseplate material on the model with spacer positioned under the rim to create space for the healing caps. Fabricate a wax rim over the baseplate. Send the assembly to the clinician for his interocclusal records.

If the master model shows very little ridge or the baseplate is not stable, incorporate a minimum of two (non-hexed) Indexed Abutment Temporary Sleeves with screws into the baseplate. This creates a stable baseplate for try-in by the clinician.

Distortion in materials may cause an inaccurate impression. A verification jig must be made for all multi-unit restorations. The clinician may fabricate a verification jig chairside prior to the try-in of the wax rim.

Verification Jig Fabrication

Step 1: Using the long screws, place the Indexed Abutment Temporary Sleeves on the master model.

Step 2: Intertwine the dental floss around the temporary abutments to support the pattern resin or light-cure material.

Step 3: Lute the temporary abutments together with a pattern resin or a light-cure material. Keep the material off of the tissue.
Step 4: Section the pattern resin between the temporary abutments. Mark the temporary abutments for orientation and return them to the clinician individually or luted together sections.

Step 5: Send the sectioned verification jig with long screws to the clinician for try-in and to lute the sections together in the mouth.

Clinical Procedure
Bite Registration and Verification Jig Try-in

Step 1: Remove the Indexed Abutment Healing Caps from the implants where the temporary sleeves were incorporated into the wax rim. Attach the wax rim to these implants. Contour the wax occlusal rim and mark the midline, lip line and smile line.

Step 2: Remove the baseplate and wax occlusal rim assembly.

Step 3: Select the appropriate tooth shade and size and return to the laboratory for denture teeth wax set-up.

Step 4: Remove all the healing caps with a hand-held .048” Hex Driver.

Step 5: Place the sectioned verification jig onto the Indexed Abutments and firmly tighten the long screws.

Step 6: Lute the sections together using a pattern resin or light-cure material.

Step 7: Confirm that a passive fit has been achieved and remove the verification jig.

Step 8: Replace the healing caps and return the verification jig to the dental laboratory.

Laboratory Procedure
Denture Wax Try-in and Model Verification

If the clinician has taken a new master impression with the verification jig in place, a new master model must be poured.

Step 1: Once the clinician has established a passive fit with the verification jig, the master model must 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 Indexed Abutment analog(s) from the master model. Attach the 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.

Step 2: Mount the master model and the opposing arch on a semi-adjustable or a fully adjustable articulator. Set up the denture following normal prosthodontic procedures. Return the denture set-up to the clinician for a denture try-in.

Clinical Procedure
Denture Wax Try-in for the Patient

Step 1: Remove the healing caps that correspond to the temporary sleeves in the denture. Place the denture for try-in into the patient’s mouth and secure it with the temporary sleeve screws. Obtain the patient’s written approval on the esthetics, phonetics and function of their new denture. Remove the denture and replace the healing caps. Return to the laboratory for the fabrication of the cast metal bar.

Step 2: The patient and clinician should approve the tooth set-up in wax prior to bar fabrication.
Laboratory Procedure

Waxing Procedure

Step 1: Use putty or plaster matrix to index the facial contours of the approved wax set-up. This will provide a guide for bar positioning and placement of any attachments.

Step 2: Remove the matrix and the wax set-up from the model. Fasten the Gold Indexed Abutment Waxing Sleeves to the model using the Indexed Abutment Fastening Screws and a .048” Hex Driver. If an Indexed Abutment Plastic Waxing Sleeve is used, reduce the occlusal height of the Plastic Sleeves to fit within the matrix of the denture set-up.

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

Step 4: Place the matrix back on the model. Use the matrix as a guide for the placement of the bar patterns. The patterns should be positioned lingual to the teeth. Modify each bar section so the embrasures are open for easy cleaning.

Step 5: Connect the bar patterns to the waxing sleeves with wax, Duralay® (Reliance Dental Manufacturing) or Pattern Resins (GC America, Inc.). 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.

Spruing Procedure

Step 1: Before spruing, verify the fit of the bar. The bar should fit passively with no rocking. If the wax-up does not have a passive fit, section the patterns, verify the fit and reconnect using wax or a non-shrinking luting material.

Step 2: Use either direct or indirect sprue techniques. Let the wax-up sit and cool for 30-60 minutes before removing the framework from the model. Re-verify the fit for passivity.

Step 3: Remove the wax pattern from the model and attach it to the ring base. Position the wax-up so the screw access holes are perpendicular to the bar.

Investing Procedure

Step 1: Use a fine grain investment and follow the manufacturer’s recommendations for liquid/water/powder ratios, mixing times, etc.

When casting to gold, do not use a debubblizer. As an alternative, rinse off the wax-up with clean water and blow dry with oil-free air.

Step 2: Pour the investment slowly into the ring on a vibrator. Watch for the investment to flow up through the screw access hole.

Burnout and Casting

Follow the alloy manufacturer’s recommendations.

Divesting Procedure

When divesting, do not sandblast. Use a chemical divestor. Sandblasting will remove material and possibly distort the fit. After divesting, attach an abutment analog and glass bead at low pressure if needed.

Soldering Procedure

The framework should seat passively on the model. If the framework does not seat properly, it must be cut and soldered. To stabilize the framework in the soldering investment prior to investing, attach Indexed Abutment Analogs to the framework using a bur attached to the framework with sticky wax.
Finishing Procedure

Step 1: To protect the bar/abutment interface, attach the Indexed Abutment Analogs to the framework. Then finish and polish the framework.

Step 2: Re-set the denture wax-up incorporating the attachment mechanism into the new wax baseplate for try-in.

Step 3: Send the completed bar with the wax denture set-up adapted to the bar to the doctor for fit verification and final approval of the wax set-up.

Clinical Procedure

Framework Try-in

Step 1: Remove the Indexed Abutment Healing Caps using a .048" Hex Driver.

Step 2: Seat the bar using the Indexed Abutment Fastening Screws and a .048" Hex Driver.

Step 3: Confirm that the framework fits passively.

Step 4: If the framework does not seat passively, it must be cut and soldered. Section the bar where necessary and join in the mouth using Duralay®, (Reliance Dental Manufacturing) or Patten Resins GC America, Inc.). Return to the lab to be soldered.

Step 5: Try in the framework after the soldering process. Try in the wax denture set-up.

Step 6: Approve the wax denture set-up and return to the lab for final processing.

Step 7: Reseat the Indexed Abutment Healing Caps.

Clinical Procedure

Final Insertion

Step 1: Remove the Indexed Abutment Healing Caps using a .048" Hex Driver.

Step 2: Insert the bar and tighten the fastening screws using a 20Ncm Torque Driver.

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

Laboratory Procedure

Processing Procedure

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 Indexed Abutment Healing Caps using a .048" Hex Driver.

Step 2: Insert the bar and tighten the fastening screws using a 20Ncm Torque Driver.

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

Snap Abutment System

The Snap Abutment is used with two or more implants for implant attachment-retained overdenture restorations. The Snap Abutment threads directly into the implant. The Snap Abutment Housing is processed into the denture base either chairside or at the dental laboratory. 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 – less than 20° 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.

Clinical Procedures

Clinician Placement of the Snap Abutment for Direct Impressioning

To obtain the proper cuff height, prior to abutment placement, remove the healing abutments and measure any tissue depth above the platform of the implant. The abutment platform should at least be 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 Abutments to ensure proper function of the restoration.

Step 1:
- Remove the patient’s healing abutments one at a time using a .048” Hex Driver. Using the overdenture driver, place the abutment and hand-tighten.

Step 2:
- Tighten the abutments into final position using a 30Ncm Accu-Torque Wrench and the Accu-Torque Overdenture Driver.

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

Step 4:
- Inspect the impression for accuracy. Send the impression with the Snap Abutment Analogs to the laboratory to fabricate a master model. Modify the patient’s existing denture using a soft liner over the abutments.

Step 5:
- Instruct the patient to remove the prosthesis by lifting vertically when removing the denture. Pack and cure the denture to the manufacturer’s specifications. Finish the overdenture. Be careful not to damage the ball portion of the Snap Abutment.

Laboratory Procedure

Master Model Fabrication

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

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

Step 3:
- Laboratories may incorporate the Snap Abutment Housing into the denture base for stability during the wax rim and denture set-up try-in phase.

Step 4:
- For the denture wax rim and try-in, follow traditional clinical and laboratory procedures.

Laboratory Procedure

Denture Fabrication

Step 1:
- 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.

Step 2:
- Measure the tissue height. Select the Snap Abutment that is approximately 1mm above the tissue. (One millimeter above tissue will allow the female of the attachment to fully seat on the abutment without tissue interference.) Order the appropriate height Snap Abutments.

Step 3:
- Place the Snap Abutments on the model using an overdenture abutment driver. Hand tighten into place.

Step 4:
- For block-out of the Snap Abutment, seat the brass metal spacers provided. Place the Snap Abutment Housing. The brass spacer also serves as a block-out to keep acrylic from flowing into the under-cut of the female ball. Try to close the flask. Check for any interferences with the teeth. If the denture teeth interfere, grind them as necessary to create enough room for acrylic and the female attachment.

Clinical Procedure

Delivering the Final Prosthesis

Procedure for seating the final denture (Snap Abutment Housings 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 prosthesis, proper home care and hygiene.
4) Insertion instructions to the patient 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 extend the life of the nylon Snap Retention Inserts.
STEPS FOR REPLACING THE SNAP RETENTION INSERT:

The Snap Abutment Assembly includes an abutment, a housing with low retention insert, and a processing spacer. Replacement inserts are sold as 6-packs:

- 40003K: Low Retention Inserts (Red)
- 40004K: Medium Retention Inserts (Yellow)
- 40005K: High Retention Inserts (Blue)

To replace a worn-out retention insert or if more retention is desired, perform the following steps:

1) Use a sharp instrument or a bur to remove the old retention insert.
2) Place the appropriate colored insert onto the end of the Snap Abutment Retention Insert Seating Tool.
3) With firm pressure, insert (snap) the new plastic insert into the metal housing in the denture.

Clinical Procedure
Processing the Snap Abutment Assembly Chairside (Optional)

After the appropriate Snap Abutments have been placed and torqued to 30Ncm, the Snap Abutment Housing may be processed chairside.

Step 1: Mark the tops of the abutments using an indelible pencil. Position the denture over the abutments, transferring the markings to the denture base. Relieve the denture where the markings appear using a large acrylic bur.

Step 2: Remove enough acrylic to easily accommodate the Snap Abutments with the metal housing and plastic retention insert in position. The diameter of this hole should be about 5-6mm.

Create a small hole at the top of each Snap Abutment through the lingual flange of the denture to allow excess acrylic to escape during the seating of the denture.

Step 3: Place the brass spacer followed by the Snap Abutment Housing onto each Snap Abutment.

The brass spacer also serves as a block-out to prevent acrylic from flowing and engaging the undercut under the ball of the abutment.

Step 4: Confirm the fit of the denture over the Snap Abutment with the female housing and brass spacer in place. Relieve more of the denture base if necessary.

It is recommended to process one abutment at a time.

Step 5: Mix a small batch of self-polymerizing acrylic and place some on the top of the metal housing. Brush acrylic around the edge of the metal housing.

Step 6: Brush a light coat of monomer into the relieved sites in the denture.

Step 7: Insert the denture. Excess material will be expressed through the lingual vent holes. Have the patient bite down into the centric relationship and maintain pressure until material is set.

Step 8: Once the acrylic has setup, remove the denture. The housing is now cured into the denture base.

Step 9: Use a small brush to paint acrylic into any voids around the metal housing.

Step 10: Once the acrylic has set up, grind off any flash of acrylic using a small bur.

Step 11: Repeat this entire procedure for any additional implants.
O-Ring Abutment System

Implant Attachment-Retained Overdentures

The O-Ring Abutment is designed to provide a direct attachment for implant attachment-retained overdentures retained by two or more implants. They allow for up to 10 degrees of divergence. The O-Ring Abutments may be processed either chairside (direct technique) or by the laboratory (indirect technique). A new denture may be fabricated or the o-rings can be retrofitted to an existing denture.

The O-Ring Abutment packaging includes a red processing o-ring for use during processing, a black clinical o-ring for the denture to engage the undercut in the abutment post, and a titanium keeper, which is processed in the denture.

Clinical Procedure-Direct Technique

Abutment Placement

Step 1: Remove the Cover Screws from the implants using a .048” Hex Driver.

Step 2: Select the appropriate O-Ring Abutment cuff height. The platform of the O-Ring Abutment should be 1-2mm above tissue level.

Step 3: Place the O-Ring Abutment into the implant and hand tighten using an Overdenture Abutment Driver. Use a 30Ncm Torque Wrench to complete the tightening.

Processing Chairside

Step 1: Mark the tops of the abutment posts using an indelible pencil. Position the denture over the abutment post, transferring the markings to the denture base. Relieve the denture using a large acrylic bur.

Step 2: Remove enough material to easily accommodate the O-Ring Abutment Post with the Titanium Keeper and O-Ring in position. The diameter of this hole should be about 5-6mm.

Create a small hole at the top of each O-Ring Abutment through the lingual flange of the denture to allow excess acrylic to escape during the seating of the denture.

Step 3: Place a red processing o-ring into the titanium keeper. Use a blunt instrument to press the o-ring into place.

Step 4: Place rubber dam over the O-Ring Abutments to protect the tissue from acrylic.

Step 5: Place the titanium keepers with o-rings onto each abutment post.

Step 6: Using soft wax or block out compound, block out below the metal keeper on the abutment to keep acrylic from going into the undercut areas and prevent acrylic from locking the denture onto the o-ring post. Block out the top of the O-Ring Abutment to provide space between the abutment and the acrylic.

Step 7: Confirm the proper fit of the denture over the o-ring abutment posts with the o-rings and keepers in place. Relieve more of the denture base if necessary.

It is recommended that no more than one titanium keeper at a time be cured into the denture.
Step 8: Mix a small batch of self-polymerizing acrylic and place some on the top of each titanium keeper and o-ring assembly. Brush acrylic around the knurled edge of the titanium keeper.

Step 9: Brush a light coating of monomer into the relined sites in the denture.

Step 10: Insert the denture. Excess material will be expressed through the lingual vent holes. Have the patient bite down into centric relationship and maintain pressure until the material is set.

Step 11: Once the acrylic has set up, remove the denture. The titanium keepers are now cured into the denture base.

Step 12: Use a small brush to paint acrylic into any voids around the retaining ring.

Step 13: Once the acrylic has set-up, grind off any flash of acrylic using a small bur.

Step 14: Repeat this entire procedure for any additional implants.

Step 15: Use an explorer to remove the red processing o-rings from the titanium keeper.

Step 16: Use a blunt instrument to push a new black clinical o-ring into position.

The life span of the o-rings depends on the patient and conditions of the inter-oral environment. Implant divergence, tobacco smoke and alcohol all have an effect on retention and longevity of the o-rings.

Clinical Procedure-Indirect Technique
Abutment Placement

Step 1: Remove the Cover Screws from the implants using a .048” Hex Driver.

Step 2: Select the appropriate O-Ring Abutment cuff height. At a minimum, the platform of the O-Ring Abutment should be 1-2mm above tissue level.

Step 3: Place the O-Ring Abutment into the implant and hand tighten using an Overdenture Abutment Driver. Use a 30Ncm Torque Wrench to complete the tightening.

O-Ring Abutments for the indirect technique follow conventional denture techniques. The O-rings are processed by the laboratory at the time the denture is processed.

Impressioning

Step 1: Record the impression directly over the O-Ring Abutments. Do not place the titanium keeper with the o-ring. Capture all anatomic landmarks in the impression needed to fabricate a conventional denture.

Step 2: Remove and inspect the impression for accuracy after the impression material sets up.

Step 3: Send the impression with O-ring abutment analogs, titanium keepers and the processing and clinical O-rings to the dental laboratory for denture fabrication and O-ring processing.

Leave the male O-ring abutments seated in the implants and relieve inside of the existing denture. Reline the denture using a soft reline material.
Laboratory Procedure

Pouring the Model

**Step 1:** Insert the O-ring abutment analogs into the impression.

**Step 2:** Pour the impression in a hard stone material. Separate the model from the impression after the stone sets.

All procedures for the O-ring abutment Indirect Technique follow conventional denture techniques. The O-Rings are processed at the time the denture is fabricated. The O-rings may be processed either with the denture or after the denture is processed using cold-cure acrylic.

Processing the O-Rings

**Step 1:** Use a blunt instrument to place the red processing O-ring into the titanium keeper.

**Step 2:** Position the titanium keeper with O-ring over the o-ring abutment analogs in the model.

**Step 3:** Use a block out compound or stone to block out the undercut below the titanium keeper. Block out the top of the O-ring abutment to provide space between the abutment and the acrylic.

**Step 4:** Use conventional denture procedures to process the denture on a duplicate model.

**Step 5:** Use an explorer to remove the red processing O-ring.

**Step 6:** Relieve any excess acrylic using a #8 round bur.

**Step 7:** Use a blunt instrument to insert the black clinical O-rings into the titanium keeper.

**Step 8:** Return the finished denture to the clinician for final insertion.

Clinical Procedure

Final Insertion

**Step 1:** Remove the patient’s temporary denture.

**Step 2:** Seat the patient’s new denture and check the occlusion. Complete conventional procedures for delivering a final denture restoration.