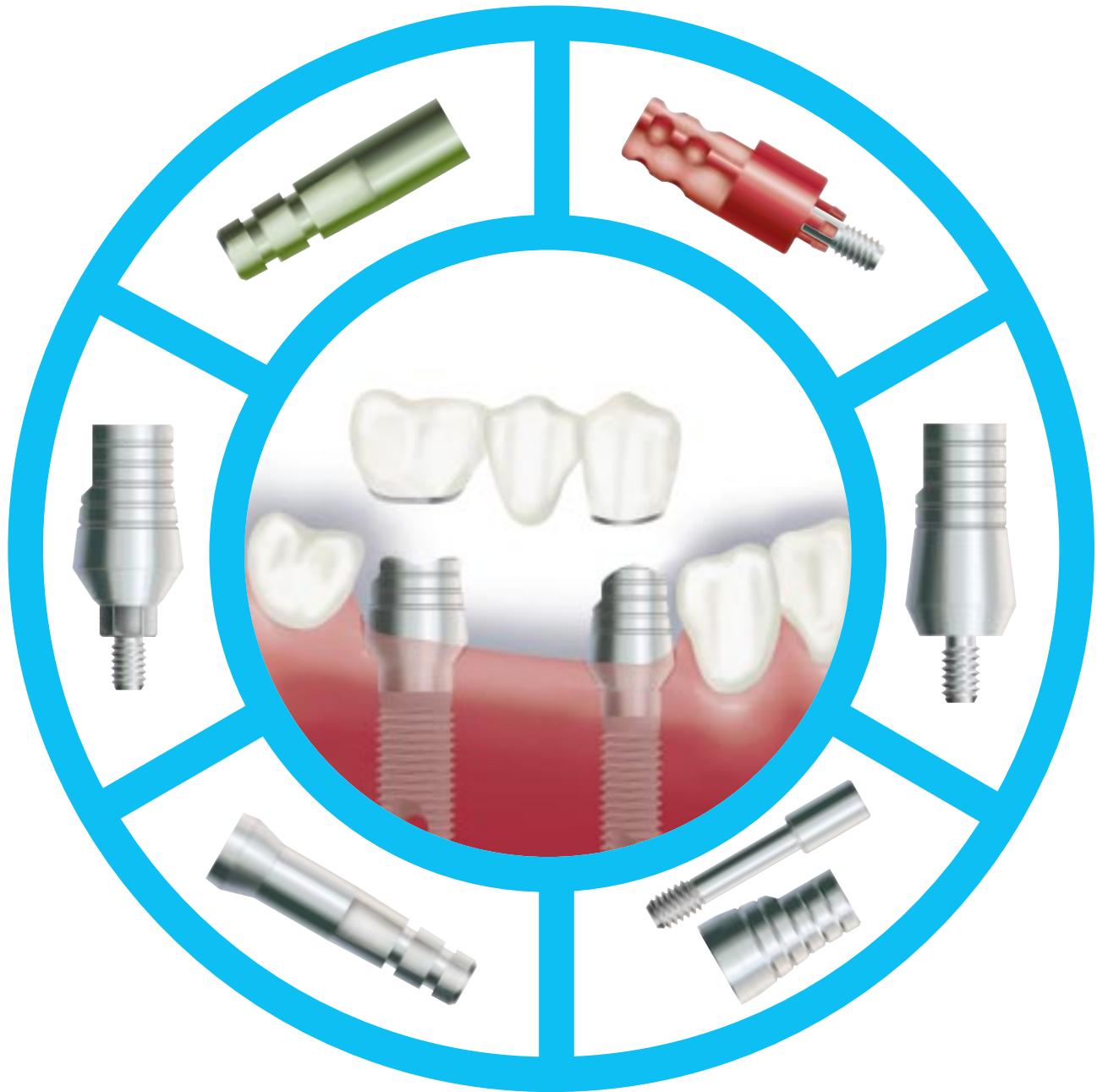


THE HEX-LOCK® ABUTMENT



UTILIZING HEX-LOCK ABUTMENTS TO FABRICATE A MANDIBULAR THREE-UNIT FIXED BRIDGE

Required Tools:

Hex Tool

1.25mmD



HX1.25 HXL1.25

Removal Tools for Abutments



TLRT
Internal
Hex

HLRTX
External
Hex

Precision Torque System



PTS

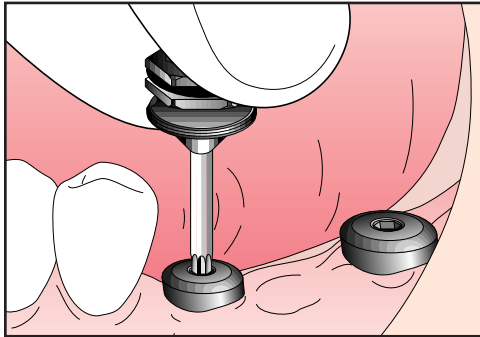
Torque Wrench



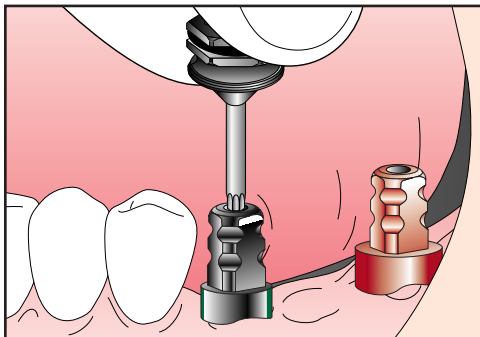
TW30

HEX-LOCK ABUTMENT TOP

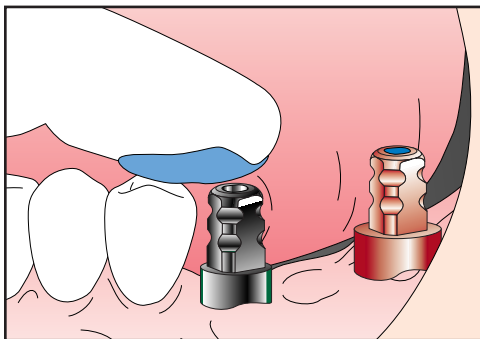
INDIRECT (CLOSED-TRAY) TRANSFER TECHNIQUE



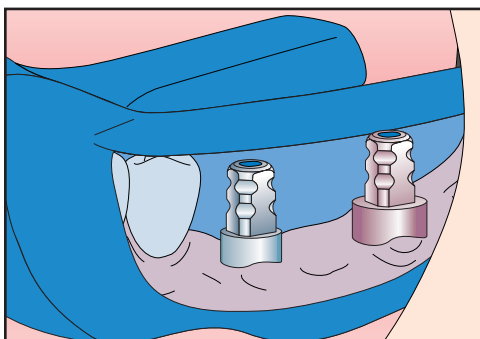
Unthread the Healing Collars from the implants with the Hex Tool.



Thread the Indirect Transfers into the implants with the Hex Tool. Be sure to orient the flat sides of the transfers buccally.



Block out the tops of the transfer screws with soft utility wax to prevent the ingress of impression material.



Check the fit of the impression tray prior to making the impression.

EXPOSING THE TOPS OF THE IMPLANTS

Fixture Mount Packaging:

- Remove the Healing Collars with the 1.25mmD Hex Tool.

Advent Implants:

- Remove the Cap Screws with the 1.25mmD Hex Tool.

If preparing the abutments chairside, proceed to **Selecting Hex-Lock Abutments**.

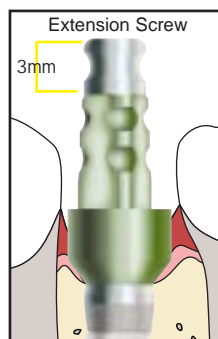
ATTACHING THE TRANSFERS

Indirect Transfers are available in various Emergence Profile Control (EPC) diameters to replicate anatomical tissue cuffs in the working cast. Use the color-coded EPC Maxillary or Mandibular Guide to select transfers in the correct anatomical dimensions.

Orient a flat side of the Indirect Transfer [HLT Series, ITX Series, AVIT/4] toward the buccal surface, interdigitate its hex with the implant's hex and press the transfer screw onto the implant. Thread the transfer screw into the implant and finger-tighten with the Hex Tool.

MAKING THE TRANSFER IMPRESSION

Take a radiograph or use a non-abrading explorer to verify that the Indirect Transfers are fully seated. Block out the hex-holes in the tops of the transfer screws with soft utility wax to prevent the ingress of impression material. Remove excess wax so that the blockout is flush with the ends of the transfer screws. Failure to do so may prevent an accurate transfer procedure.



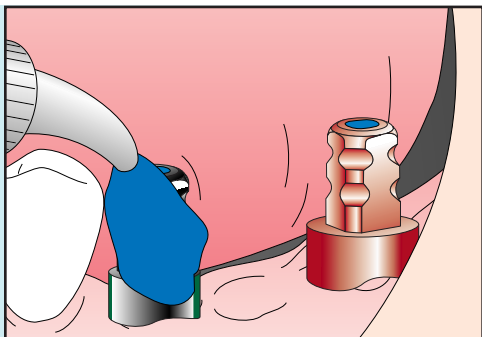
VERIFYING THE FIT OF THE IMPRESSION TRAY

Verify that the Indirect Transfers fit within the confines of the custom tray or the modified stock tray prior to injecting the impression material.

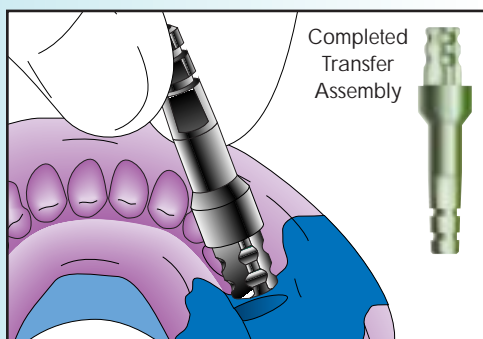
In areas where a greater length of transfer body is required, replace the transfer screw with the extension screw (HLTE for internal hex implants and ITXE for external hex implants). This will increase the length of the transfer by 3mm and provide another circumferential groove for added vertical retention.

HEX-LOCK ABUTMENT TOP

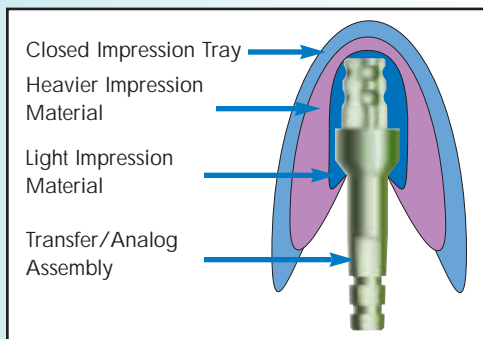
INDIRECT (CLOSED-TRAY) TRANSFER TECHNIQUE



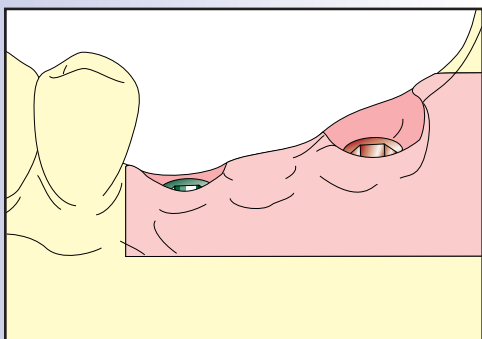
Use light-body and heavier body vinyl polysiloxane impression material for the transfer impression.



Align the flat sides of the transfer with the flat sides of its corresponding impression hole and insert the transfer assembly until it fully seats.



Cross section of the impression tray showing the transfer/Implant Analog assembly.



Fabricate the working cast with a replica of the soft tissue around junctions of the Implant Analogs and transfers.

INJECTING THE IMPRESSION MATERIAL

An elastomeric impression material is recommended, such as vinyl polysiloxane. Inject light-body impression material around the transfers and fill the closed tray with heavier body impression material. Make a full-arch impression, and allow the material to set according to the manufacturer's recommendations before removing. Unthread the Indirect Transfers from the implants in the patient's mouth. Make interocclusal records and an impression of the opposing arch. Send the impressions and transfer assemblies to the laboratory for fabrication of the working casts. Replace the Healing Collars on the implants in the patient's mouth.

SEATING THE TRANSFER ASSEMBLY

Remove one Indirect Transfer with the Hex Tool and attach it to its corresponding Implant Analog:

- Implant Analog for an internal hex implant, 3.5mmD neck: [IA3](#).
- Implant Analog for an internal hex implant, 4.5mmD neck: [IA4](#).
- Implant Analog for an internal hex implant, 5.7mmD neck: [IA5](#).
- Implant Analog for an external hex implant, 4.0mmD neck: [IAX](#).
- Implant Analog for an AdVent Implant: [AVR](#).

Align the transfer's flat sides with the flat sides of its corresponding impression hole and insert the transfer assembly into the impression material. A double click will indicate when the assembly has fully seated. Repeat this procedure with all remaining transfers still in the patient's mouth.

CROSS SECTION OF TRANSFER IMPRESSION

From the cross section of the Indirect Transfer impression, note that there is no access to the transfers from outside of the impression tray.

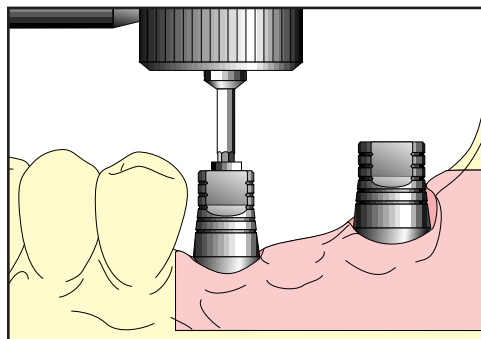
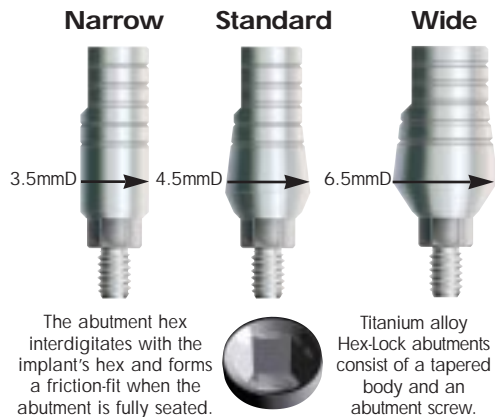
FABRICATING THE WORKING CAST

Place soft tissue replication material around the junctions of the assembled Implant Analogs and transfers inside the impression. Take care not to cover the retention grooves of the Implant Analogs with the material. After the material sets, pour the impression in dental stone. Separate the cast from the impression. The Implant Analogs will be incorporated within the stone cast with the same hex positions and orientations as the implants in the patient's mouth. Unthread and remove the transfers from the Implant Analogs with the Hex Tool. The soft tissue replication material may be removed for a visual inspection of the abutment/implant connections, if desired.

Pour the opposing arch impression in dental stone, then utilize the interocclusal records to articulate the casts.

HEX-LOCK ABUTMENT TOP

SELECTING THE ABUTMENT



Interdigitate the mating hexes of the abutment and Implant Analog, then fully seat the abutment by applying the appropriate torque to the screw.

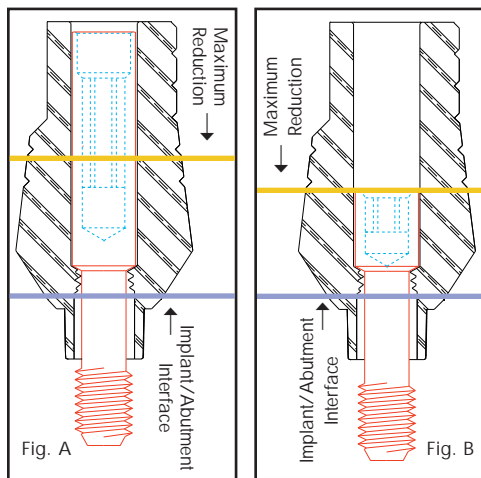
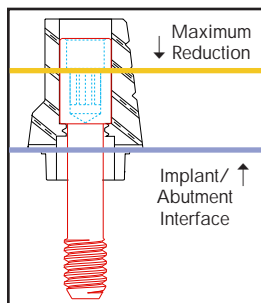


Fig. A
Hex-Lock Abutment with standard abutment screw.

Fig. B
Hex-Lock Abutment with optional abutment screw.



Advent Implant Hex-Lock Abutment with abutment screw.

SELECTING HEX-LOCK ABUTMENTS

Hex-Lock Abutments (HLA) and corresponding transfers are available in three diameters for implants with 3.5mmD and 4.5mmD implant platforms: "Narrow" matches the implant platform diameter, "Standard" is 1mm wider than the platform and "Wide" is 2mm wider than the implant platform. Implants with 5.7mmD platforms only accept the "Wide" HLA. The AdVent accepts both "Standard" and "Wide" HLAs. Since wide implants are used in wide ridges, the "Standard" HLA diameter is usually the diameter of choice. When a wider crown profile is indicated due to available mesiodistal space, fabrication of the crown can be just as easily accomplished with the "Standard" HLA abutment as it is with the wide HLA abutment. Similarly, there are very few instances where the "Narrow" abutment would be indicated over the "Standard" one, since the latter can always be prepared to the desired anatomical form. The exception would be for replacement of a lower central incisor with a 3.7mmD implant.

SEATING HEX-LOCK ABUTMENTS

Interdigitate the abutment's hex with the hex of the Implant Analog in the working cast (or implant in the patient's mouth) and place the abutment onto the Implant Analog (or implant). Thread the abutment screw through the abutment body and into the Implant Analog (or implant) with the Hex Tool. To complete seating and create a friction-fit connection, tighten the abutment screw to 30 Ncm.

DETERMINING HEX-LOCK ABUTMENT MODIFICATIONS FOR INTERNAL HEX AND EXTERNAL HEX IMPLANTS

Hex-Lock Abutments extend 8.6mm (internal hex implants) or 10.5mm (external hex implants) vertically above the implant/abutment interface.

Visually determine the modifications necessary for establishing marginal and vertical contours. The 1mm radial score lines on the abutment body aid in determining vertical dimensions. In order to preserve adequate hex engagement within the abutment fixation screw, do not vertically reduce the abutment lower than the second score line (Fig. A) above the junction of the abutment and Implant Analog (or implant). This reduction provides a vertical height of 4.7mm above the internal hex implant and 6.5mm above the external hex implant.

To reduce the abutment below this score line, a lower profile, optional abutment screw [MHLAS for internal hex implants or the GPCAS for external hex implants] must be used (Fig. B). This low-profile screw provides a vertical height of 3.7mm above the internal hex implant and 4.8mm above the external hex implant.

DETERMINING HEX-LOCK ABUTMENT MODIFICATIONS FOR ADVENT IMPLANTS

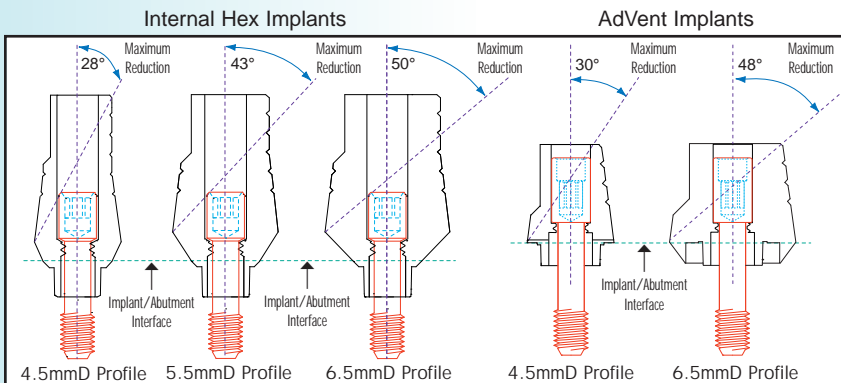
Hex-Lock Abutments for the AdVent Implant extend 5.0mm vertically above the top of the implant/abutment interface.

Visually determine the modifications necessary for establishing marginal and vertical contours. The 1mm radial score lines on the adapter body aid in determining vertical dimensions. To preserve sufficient hex engagement within the abutment screw, do not vertically reduce the adapter lower than halfway between the first and second score lines above the top of the Implant Analog (or implant). This reduction will produce an abutment 2.8mm in height above the top of the Implant Analog (or implant).

HEX-LOCK ABUTMENT TOP

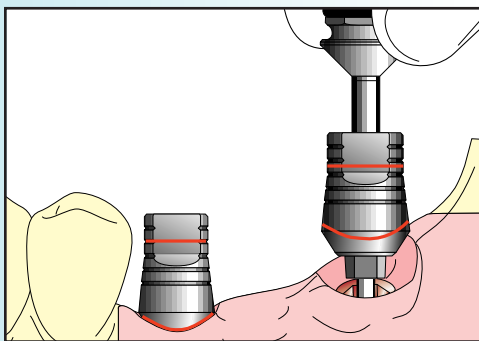
PREPARING THE ABUTMENT

PREPARING ABUTMENTS TO THE MAXIMUM ANGLE

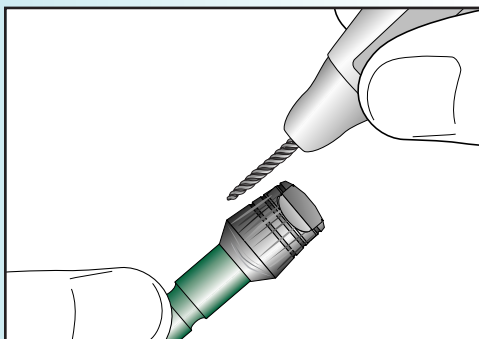


Hex-Lock Abutments can be prepared at an angle to achieve mutual parallelism and to create a favorable path of draw for the prosthesis. When these components are used with the optional, low-profile abutment screws, the maximum angles of correction shown on the left can be achieved.

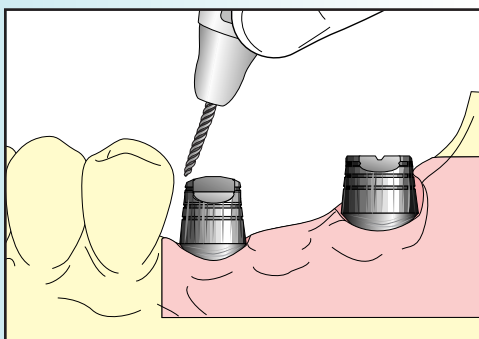
Caution: Do not prepare Hex-Lock Abutments for external hex implants more than 22°, 29° and 35°, respectively.



With a felt-tipped pen, mark the abutments with the desired marginal and contour adjustments, then remove the abutments from the working cast.



Attach the abutment to an Implant Analog or Paragon Abutment Holder, and then modify with a combination of carbide and diamond burs.



Make final adjustments to the abutments on the working cast.

MARKING THE HEX-LOCK ABUTMENTS

Mark the desired marginal and vertical reductions on the abutments with a felt-tipped pen. Remove the marked abutments from the working cast prior to preparing the components. Due to the friction-fit connection between the abutment and the Implant Analog (or implant), a removal tool is required to remove the abutment once it has been fully seated. Remove the abutment screw with the Hex Tool. Thread the removal tool [TLRT2, HLRTX] through the abutment and into the Implant Analog (or implant) until the tool releases the friction-fit abutment from the Implant Analog (or implant).

MODIFYING HEX-LOCK ABUTMENTS

Attach the abutment to a Paragon Abutment Holder (or to an additional Implant Analog). Modify the abutment with cut-off disks, heatless stone wheels and 12-fluted carbide burs. Use a diamond bur to define the margins. Create a dimple on the buccal surface to help orient the abutment on the implant. Preserve or redefine a flat surface as an anti-rotational feature.

If modifying the abutments chairside, proceed to **Placing the Prepared Abutments**.

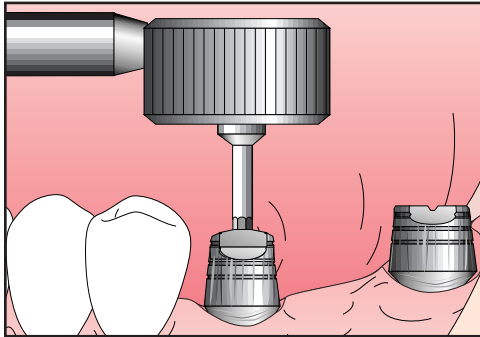
FABRICATING THE TRANSITIONAL PROSTHESIS

Replace the abutments on the working cast and make final adjustments. Take care not to damage the soft tissue material, which can be removed from the working cast, if necessary.

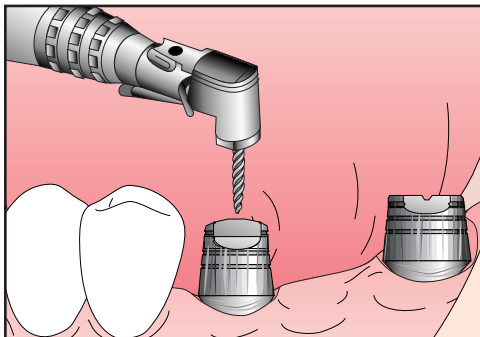
If a diagnostic wax-up was made, make an alginate impression over it and pour the impression in dental stone. Mold a clear acrylic sheet onto the cast of the diagnostic wax-up according to the manufacturer's instructions. Remove the mold from the cast. Lubricate the abutments and working cast and then flow temporary material into the areas of the abutments and missing teeth in the mold. Seat the mold onto the cast containing the prepared abutments. Trim the resulting transitional prosthesis and return it with the prepared abutments to the dentist.

HEX-LOCK ABUTMENT TOP

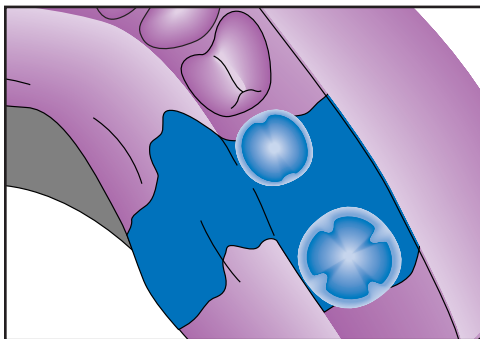
MAKING THE IMPRESSION



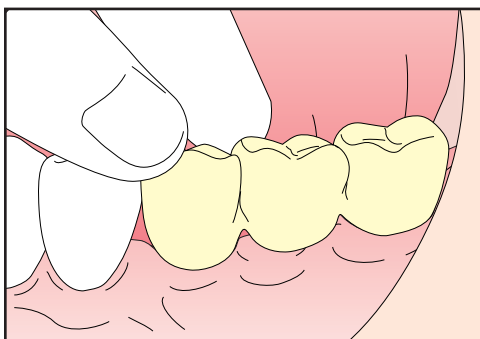
Tighten the prepared abutments with the Hex Tool and torque wrench or Paragon Motor.



Make final adjustments under copious irrigation to keep the implants and tissues cool.



To fabricate the final restoration, make a conventional crown-and-bridge impression of the prepared abutments.



Provisionally cement the transitional prosthesis.

PLACING THE FINAL ABUTMENTS

Sterilize the prepared abutments before replacing them into the patient's mouth. Interdigitate the hexes of each abutment and implant, then thread the abutment screw through the abutment body and into the implant. Tighten each abutment screw with the Hex Tool and torque wrench or Paragon Motor to 30 Ncm. Wait ten minutes, then retighten the abutments to 30 Ncm.

MAKING FINAL ADJUSTMENTS TO THE ABUTMENTS

With a round-end, 12-fluted carbide bur in a high-speed handpiece, make minor modifications to the gingival and vertical contours of the abutments under copious irrigation. After completing final modifications, retighten the abutment screws to the recommended torque. Take a radiograph to confirm that the abutments are fully seated.

MAKING AN IMPRESSION OF THE PREPARED ABUTMENTS

Block out the Hex-Holes in the tops of the abutment screws with soft utility wax to prevent the ingress of impression material. Remove excess wax so that the blockout is flush with the ends of the abutment screws. Failure to do so may prevent an accurate transfer procedure. Make a conventional, full-arch, crown-and-bridge impression with an elastomeric impression material, such as vinyl polysiloxane. To insure a proper fit of the finished restoration, the abutments must remain in the patient's mouth after completing the impression procedure. Send the impression to the laboratory to fabricate a porcelain-fused-to-metal bridge.

CEMENTING THE TRANSITIONAL PROSTHESIS

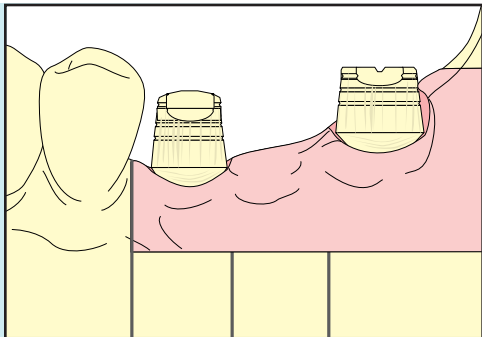
If the laboratory has fabricated a transitional prosthesis, provisionally cement it onto the prepared abutments.

If a transitional prosthesis has not been fabricated, block out any undercuts and lightly lubricate the abutments. Fabricate a transitional prosthesis over the abutments chairside with a light-cure or autopolymerizing tooth colored acrylic material. For a more dense cure, remove the set transitional prosthesis from the mouth and place it in a curing unit.

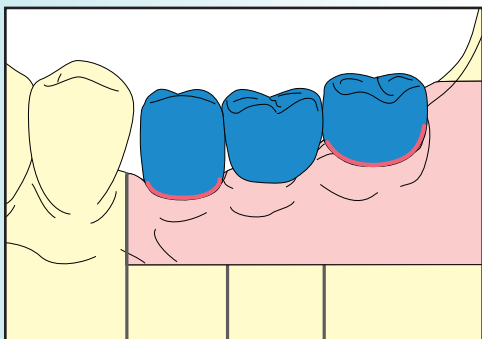
After curing, remove the provisional restoration from the mold, trim it and provisionally cement the finished transitional prosthesis onto the abutments.

HEX-LOCK ABUTMENT TOP

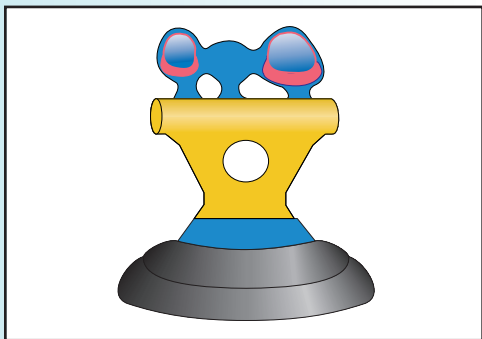
FABRICATING THE FRAMEWORK PATTERN



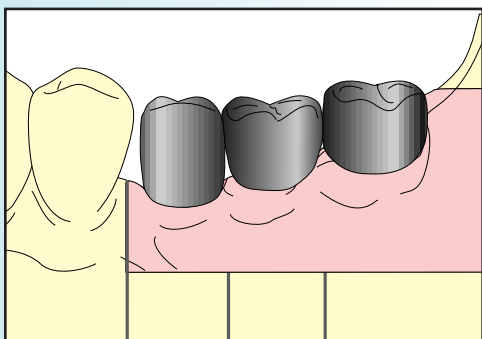
Prepare the working cast for fabrication of the wax framework pattern.



Fabricate a conventional wax framework pattern on the working cast.



Sprue, invest and cast the framework pattern.



Divest and finish the cast framework. Verify that the framework fits passively on the working cast.

POURING THE WORKING CAST

Pour the standard crown-and-bridge impression in die stone. An epoxy die material may be useful if preparations are extremely thin. Separate the cast from the impression. Utilize the interocclusal records to articulate the working cast with the opposing arch cast. Prepare the working cast to fabricate the wax framework pattern.

FABRICATING THE WAX FRAMEWORK PATTERN

Create the wax framework pattern according to routine crown-and-bridge procedures.

SPRUING, INVESTING AND CASTING THE FRAMEWORK PATTERN

Attach 10-gauge sprue wax with reservoirs to the thickest part of each unit within the framework pattern. Add auxiliary sprues and vents to prevent porosity in the casting, as needed.

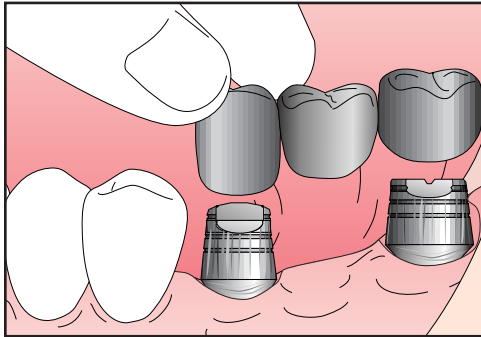
Invest and cast the pattern in noble or high noble ceramic alloy according to the manufacturer's guidelines.

FINISHING THE CAST FRAMEWORK

Divest the cast framework with ultrasonic cleaning and non-abrasive glass bead. Follow conventional laboratory techniques to fit and finish the cast framework. Seat the finished framework onto the working cast and confirm that a passive fit has been achieved. Place the framework on the working cast and send it to the clinician for a try-in of the metal framework. The dentist must confirm that a passive fit has been achieved before the veneering material is applied.

HEX-LOCK ABUTMENT TOP

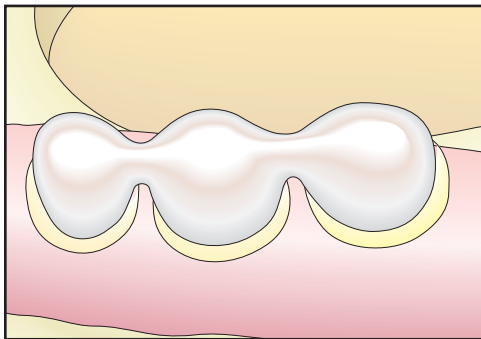
SEATING THE FINAL RESTORATION



Try in the finished framework and verify that it fits passively.

TRYING IN THE FINISHED FRAMEWORK

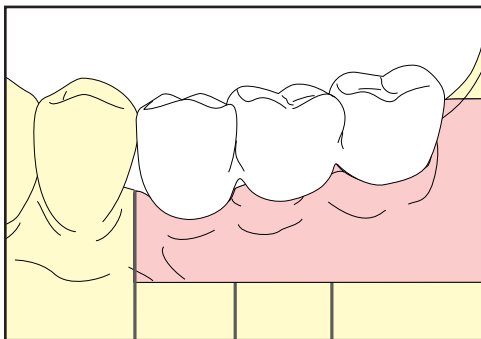
Remove the provisional restoration from the patient's mouth. Retorque the abutments with the Hex Tool and torque wrench or Paragon Motor. Seat the finished framework onto the abutments. Verify that it fits passively, and that no additional finishing or adjustment is required. Remove the framework. Reseat the transitional prosthesis with soft-access cement. Return the framework to the laboratory on the working cast for fabrication of a porcelain-fused-to-metal, fixed partial denture. Replace the provisional restoration in the patients mouth.



Apply the opaque to the metal framework according to routine laboratory procedures.

APPLYING THE PORCELAIN

Prepare the framework to receive the opaque layer according to routine laboratory procedures.

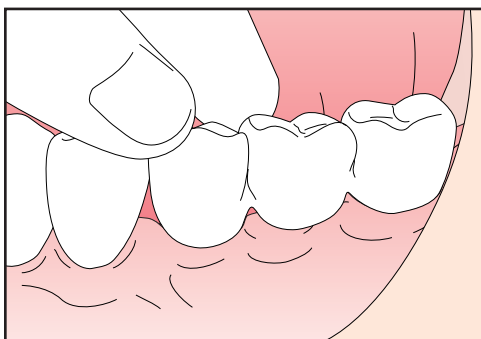


Apply porcelain to the metal framework according to routine laboratory procedures.

FINISHING THE FINAL PROSTHESIS

Apply porcelain to the framework according to routine laboratory procedures.

Finish the porcelain and polish any metal margins, seat the finished prosthesis on the working cast and send it to the clinician for final delivery.



Cement the finished prosthesis.

DELIVERING THE FINAL PROSTHESIS

Remove the transitional restoration from the patient's mouth. Retorque the abutments with the Hex Tool and torque wrench or Paragon Motor. Wait ten minutes, then retighten the abutments to the appropriate torque. Seal the screw access channel in each abutment with cotton pellets and light-curing resilient material or gutta percha. This will ensure easy access to the screw head. Seat the final prosthesis onto the abutments and confirm fit and contour. Check the occlusion. Verify that no additional finishing or adjustment is required.

Cement the final prosthesis with a composite cement. To facilitate future retrievability, a soft-access cement may be used instead. Provide the patient with oral hygiene instructions prior to release.