



ReUnion® TSA Shoulder System

Glenoid Surgical Protocol

ReUnion TSA

Glenoid Surgical Protocol

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Acknowledgments

Stryker Orthopaedics wishes to thank the ReUnion TSA Shoulder System Surgeon Panel for their dedication to the development and refinement of the ReUnion TSA Shoulder System, instrumentation, and surgical protocol.



Indications

For use as a Hemi or Total Shoulder Replacement

- Aseptic necrosis of the humeral head.
- Painful, disabling joint disease of the shoulder resulting from: degenerative arthritis, rheumatoid arthritis or post-traumatic arthritis.
- Proximal humeral fracture and/or dislocation.
- Clinical management problems where arthrodesis or alternative reconstructive techniques are less likely to achieve satisfactory results.
- Revision of previous unsuccessful total shoulder replacement, resurfacing or other procedure.

Glenoid components are intended for cemented use only. The humeral stem components are intended for both cemented and cementless use.

Contraindications

- Any active or suspected latent infection in or about the shoulder joint.
- Any mental or neuromuscular disorder which would create an unacceptable risk of prosthesis instability, prosthesis fixation failure, or complications in postoperative care.
- Bone stock compromised by disease, infection or prior implantation which cannot provide adequate support and/or fixation to the prosthesis.
- Skeletal immaturity.
- Patients whose anticipated activities would impose high stresses on the prosthesis and its fixation.
- Obesity. An overweight or obese patient can produce loads on the prosthesis which can lead to failure of fixation of the device or to failure of the device itself.

Additional Total Shoulder Contraindications:

- Absent, irreparable or non-functioning rotator cuff and other essential muscles.

See package insert for warnings, precautions, adverse effects and other essential product information.

Patient Counseling

Surgeons should discuss all relevant contraindications, adverse effects and the need for post-implantation protection with their patients.

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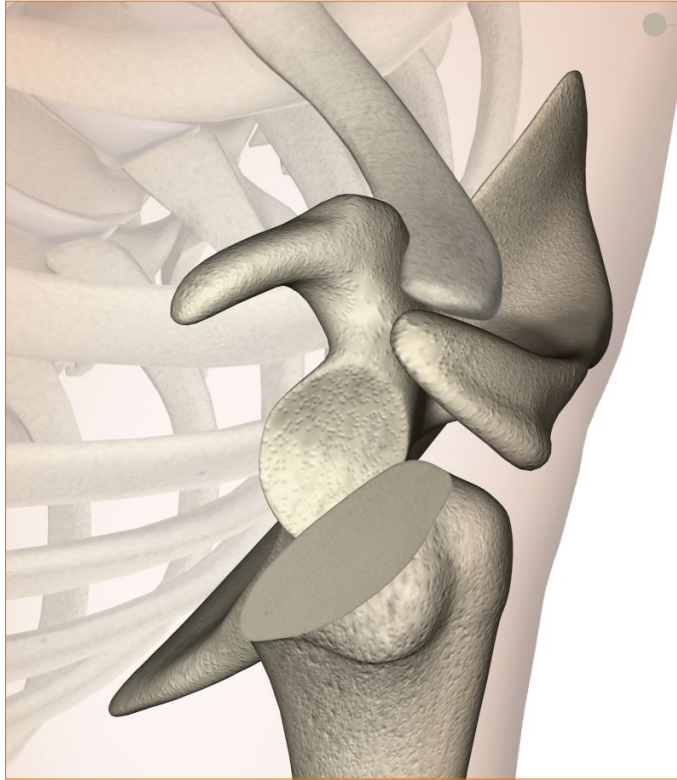


Figure 1

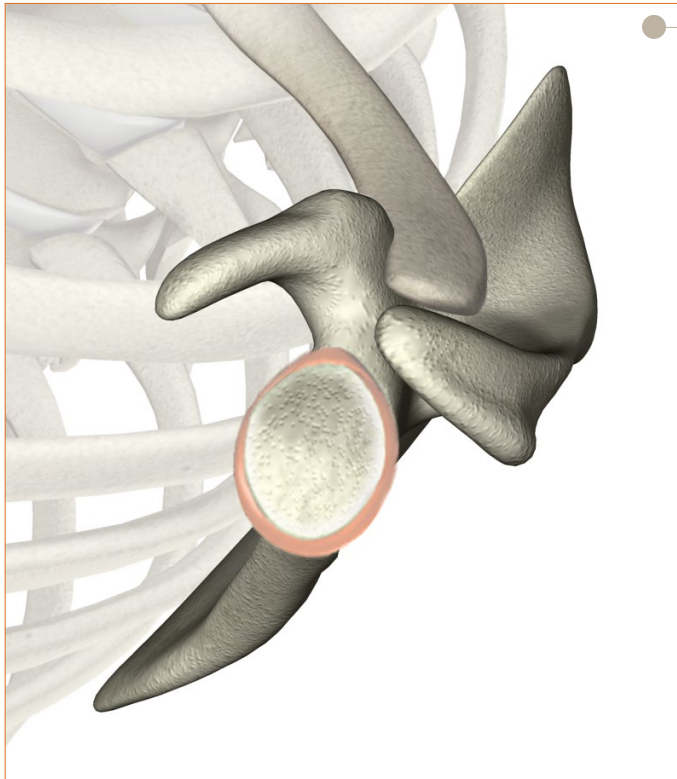


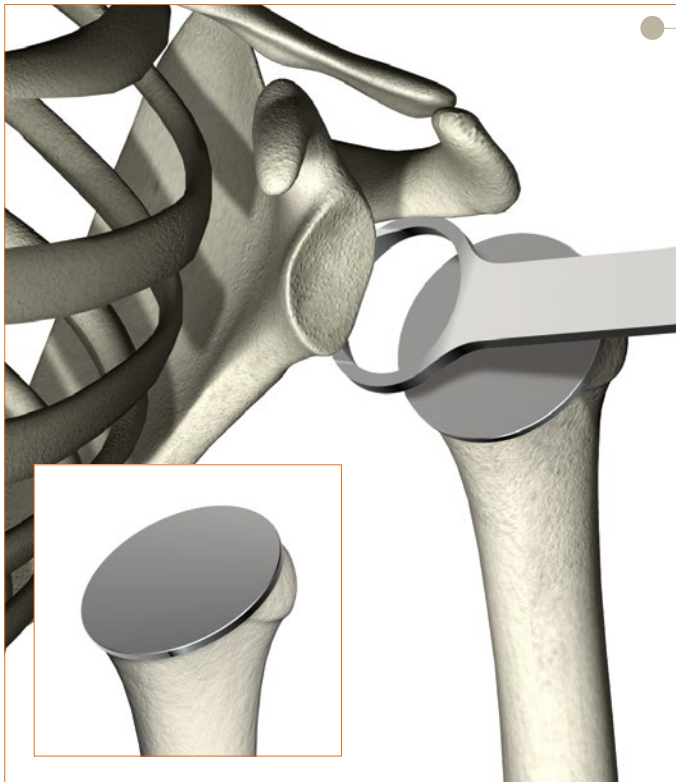
Figure 2

Surgical Technique

Pre-operative planning and glenoid exposure

- ▶ There is a wide variation of glenoid bone patho-anatomy. Accurate radiographs, CT scans, and MRI scans allow for pre-operative assessment of bone stock available to support an implant, as well as the proper positioning. Templates are available for sizing.
- ▶ Additionally, for the occasional scenario when the pegged configuration cannot be inserted (e.g. revision without defined peg-hole support, or difficult exposure), a central keeled glenoid component remains available as a back-up alternative.

- ▶ Glenoid preparation can be done either immediately following humeral head osteotomy, or alternatively, after the humeral canal has been prepared and broached (surgeon's choice).
- ▶ Retraction of the humerus posteriorly is facilitated by adequate release of the capsule from along the humeral calcar. The capsule is also stripped from the anterior and inferior rim of the glenoid, along with excision of the labrum. The arm is taken to a position of abduction, external rotation, and extension.
- ▶ A pitchfork retractor is placed anteriorly; posteriorly the 'retractor of choice' varies from one surgeon to another. It is prudent to have several alternatives (Hohman, Fakuda, custom) and to employ which ever facilitates the task.



Humeral Retraction

- ▶ To achieve optimal exposure of the glenoid, the ReUnion TSA Humeral Retractor should be utilized in conjunction with the humeral protector plates.

Figure 3

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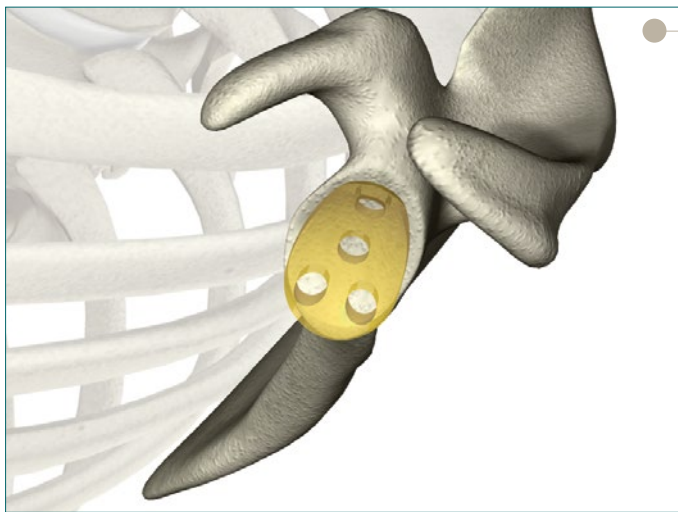


Figure 4

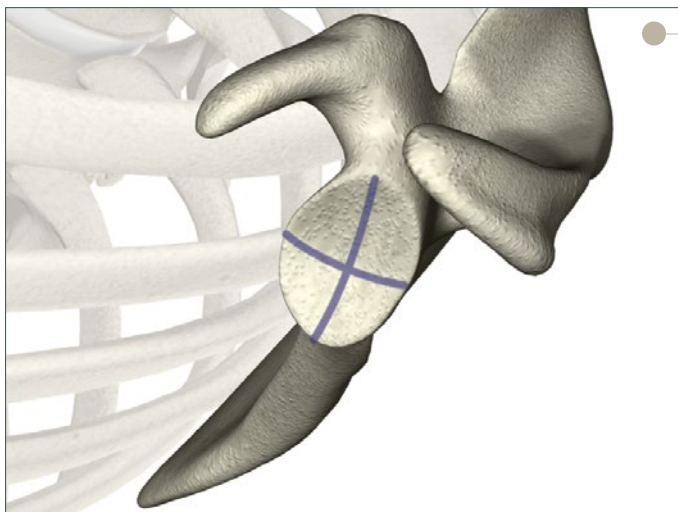


Figure 5

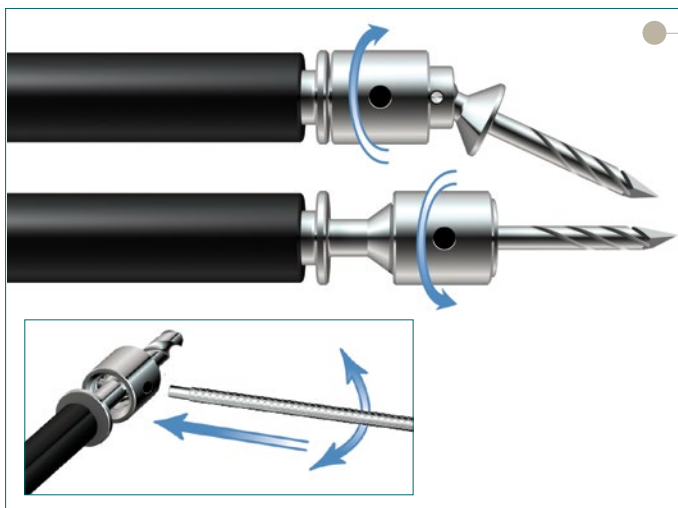


Figure 6

Glenoid Surface Preparation

Glenoid Sizing and Reaming

- Upon achieving desired exposure of the glenoid fossa, the color coded translucent glenoid surface trials should be used to determine the appropriate size of the glenoid to be implanted.
- This step is also critical in determining the size of the spherical reamer to be used. It is important to note, all of the spherical reamers have the same radius of curvature. As such, in addition to the size that matches the appropriate glenoid surface trial, larger reamer sizes can also be used as the soft tissue permits.



Warning:

Do not use the color coded glenoid surface trials as drill guides or drill templates. Attempting to drill through the surface trials may potentially damage the trials.

- Using a surgical marking pen draw two (2) lines, superior-inferior and anterior-posterior to indicate the approximate center of the glenoid (Figure 5).

- The ReUnion TSA variable angle drills are convertible instruments allowing for both fixed angle and variable angle use.
- To use the drill driver in variable angled mode, loosen the drill bit by tightly grasping the metal collar and slowly activating the drill in REVERSE mode. The cone shaped end of the drill bit will now be outside of the metal sleeve (Figure 6, Top).
- To use the drill driver in a straight or fixed angle mode, tighten the drill bit by tightly grasping the metal sleeve and slowly activating the drill in FORWARD mode. The cone shaped end of the drill bit will sit flush to the metal sleeve (Figure 6, Bottom).



Note:

In those cases where the metal collar is difficult to grasp and use, the non-threaded end of the humeral version rod can be used as a breaker bar, when inserted into the hole on the collar (Figure 6 Inset).

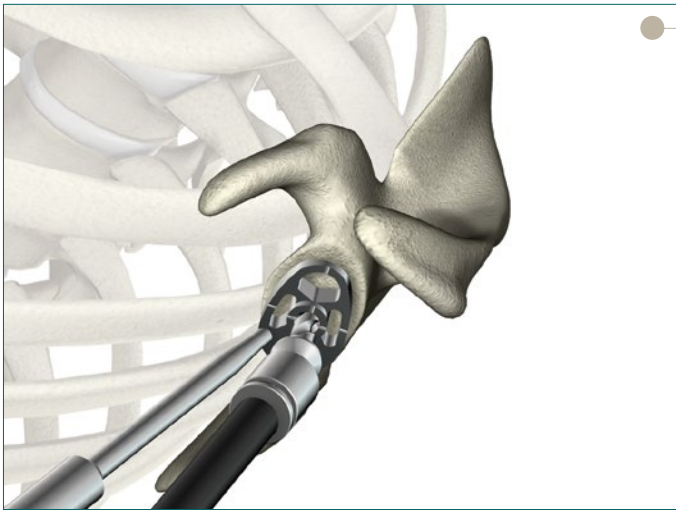


Figure 7

- ▶ Place the centering drill guide on the glenoid and align the markings on the drill guide with those lines drawn in the previous step.
- ▶ Use the centering guide with the variable angle center-hole drill bit to prepare the center hole in the glenoid at the desired angle of version.



Caution:

Prior to drilling, make sure the drill bit is fully seated within the drill guide to prevent damage to the drill bit and/or drill guide.

Also make sure that the settings on power instruments are set for “DRILL” mode or be sure to utilize drill specific attachments for proper RPM and torque settings.

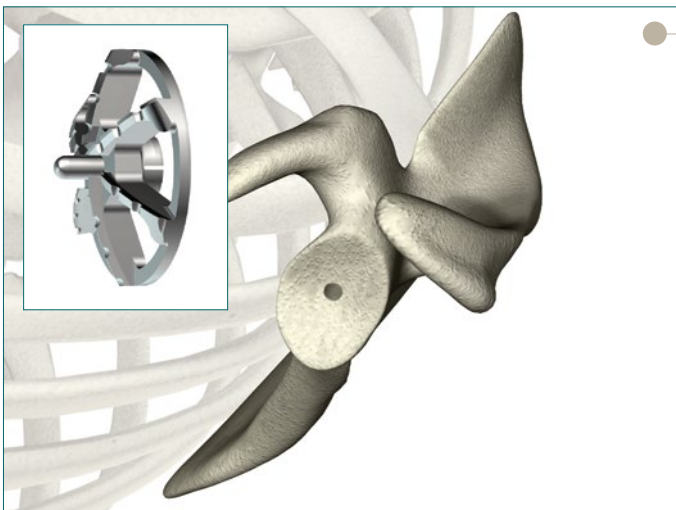


Figure 8

- ▶ The previously prepared center hole will accept the stabilizing post of the spherical glenoid reamer during glenoid contouring (Figure 8, Inset).



Tech Tip:

Effort should be made to keep the axis of the drill bit and guide holes in line.

The centering drill guide head is the same size and shape of the smallest glenoid implant, size 40.

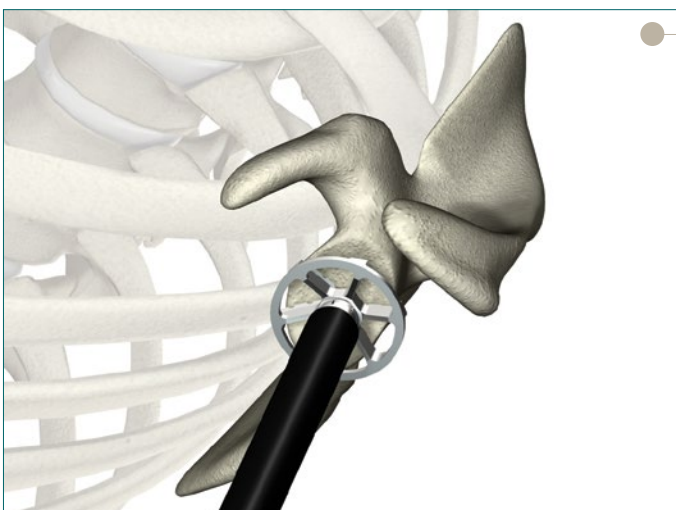


Figure 9

Straight Reamer Driver

- ▶ Select the correct spherical glenoid reamer size, as determined previously in the sizing of the glenoid with surface trials, for contouring of the glenoid fossa.
- ▶ The objective is to provide a uniform contour at the desired angle of version to achieve uniform contact for the glenoid trials and implant.



Note:

A full awareness of the patient's existing glenoid deformity/version prior to reaming is necessary to determine the amount of correction necessary for effective glenoid implantation.

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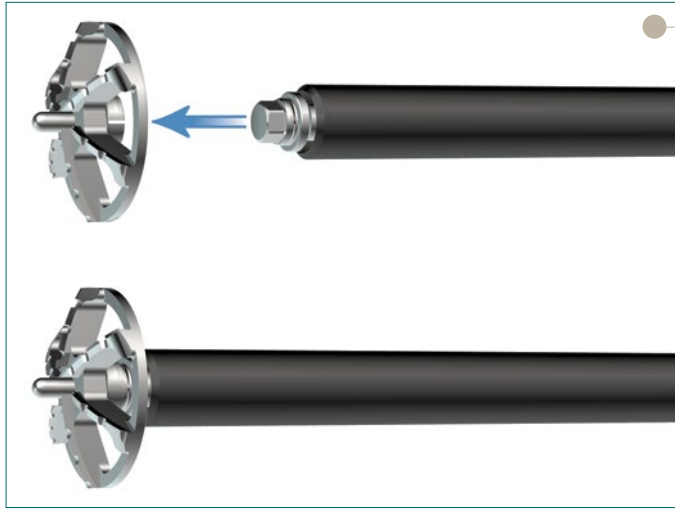


Figure 10

- ▶ The ReUnion TSA glenoid reamers are designed to be assembled via a hex shaped quick connect feature.



Notes:

During reaming, make sure to use the power instruments in “REAM” mode or be sure to utilize reamer specific attachments for proper RPM and torque settings.

For reamer disassembly please refer to page 36 of this protocol.

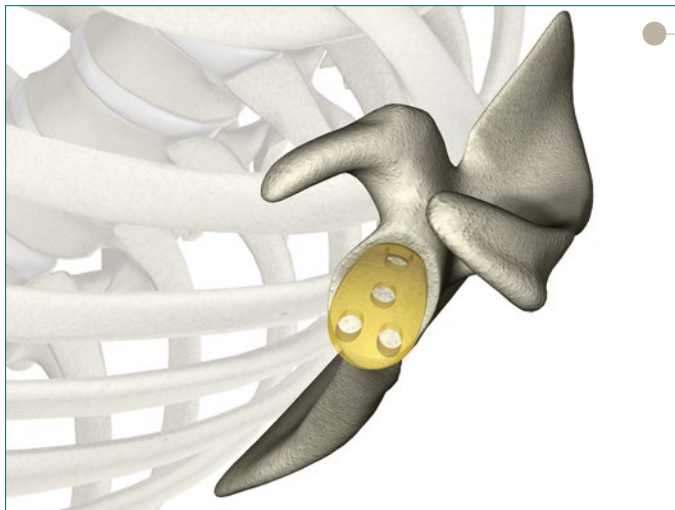


Figure 11

- ▶ Once reaming is initiated, the axis of the reamer driver should be held constant and any rocking movements should be avoided to prevent irregular or uneven surface preparation.
- ▶ Care should be taken to monitor reaming and verify the desired bone removed during the process.
- ▶ To ensure accuracy in reaming depth, a pulsing action should be utilized when reaming the glenoid.
- ▶ Once the glenoid surface preparation has been completed, surface congruency can be checked a final time utilizing the color coded translucent surface trials.

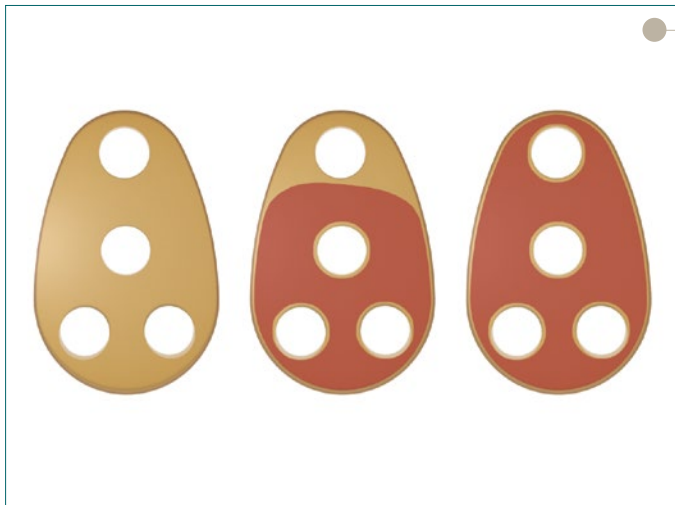


Figure 12

- ▶ Any uneven surfaces on the face of the glenoid will be presented through the translucent glenoid surface trials. (Figure 12).
- ▶ Continue to Pegged Glenoid preparation on page 13 or with the Keeled Glenoid preparation on page 23.

Angled Reamer Driver

- ▶ In addition to the Straight Reamer Driver, the ReUnion TSA Shoulder System also includes an optional Angled Reamer Driver.
- ▶ The Angled Reamer Driver is offset 45 degrees from center and is designed to facilitate the contouring of the glenoid face in those cases where access to the glenoid is particularly difficult.

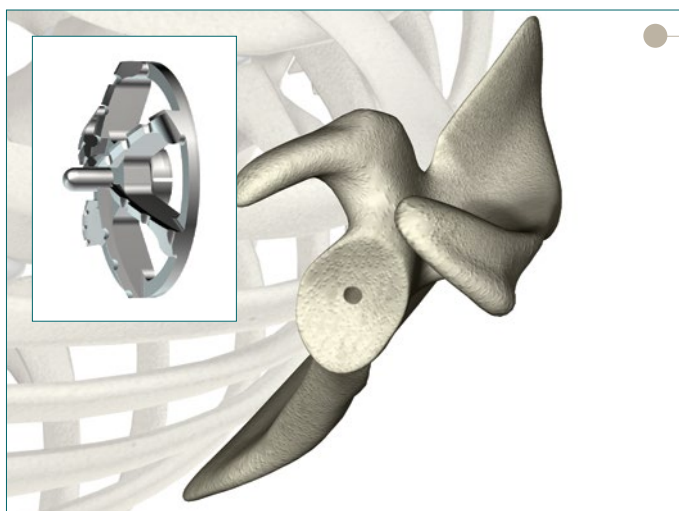


Figure 13

- ▶ Select the correct spherical glenoid reamer size, as determined previously in the sizing of the glenoid with surface trials, for contouring of the glenoid fossa.
- ▶ The objective is to provide a uniform contour at the desired angle of version to achieve uniform contact for the glenoid trials and implant.



Note:

A full awareness of the patient's existing glenoid deformity/version prior to reaming is necessary to determine the amount of correction necessary for effective glenoid implantation.

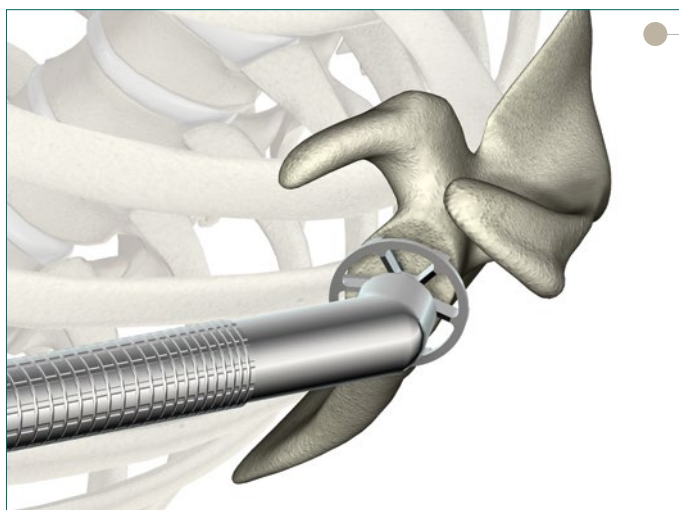


Figure 14

- ▶ Once reaming is initiated, the axis of the reamer driver should be held constant and any rocking movements should be avoided to prevent irregular or uneven surface preparation.
- ▶ Care should be taken to monitor reaming and verify the desired bone removed during the process.
- ▶ To ensure accuracy in reaming depth, a pulsing action should be utilized when reaming the glenoid.



Note:

During reaming, make sure to use the power instruments in "REAM" mode or be sure to utilize reamer specific attachments for proper RPM and torque settings.

For reamer disassembly please refer to page 36 of this protocol.

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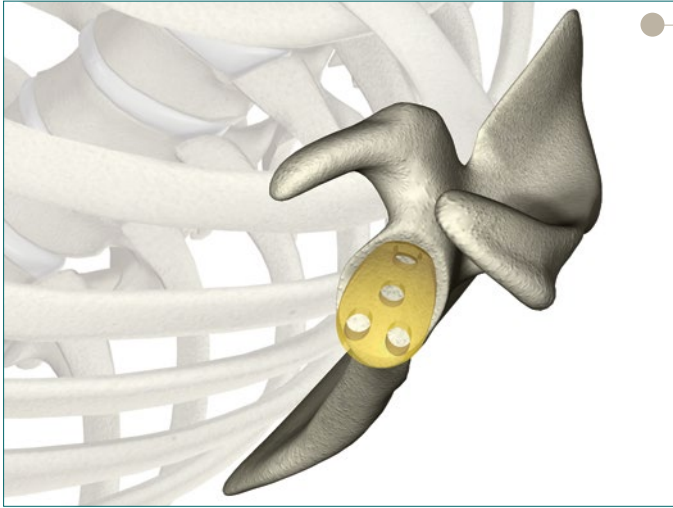


Figure 15

- ▶ Once the glenoid surface preparation has been completed, surface congruency can be checked a final time utilizing the color coded translucent surface trials.

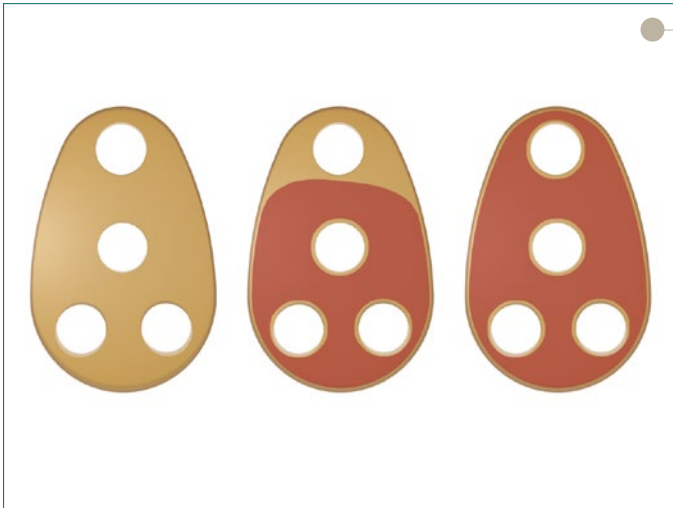


Figure 16

- ▶ Any uneven surfaces on the face of the glenoid will be presented through the translucent glenoid surface trials. (Figure 12).
- ▶ Continue to Pegged Glenoid preparation on page 13 or with the Keeled Glenoid preparation on page 23.

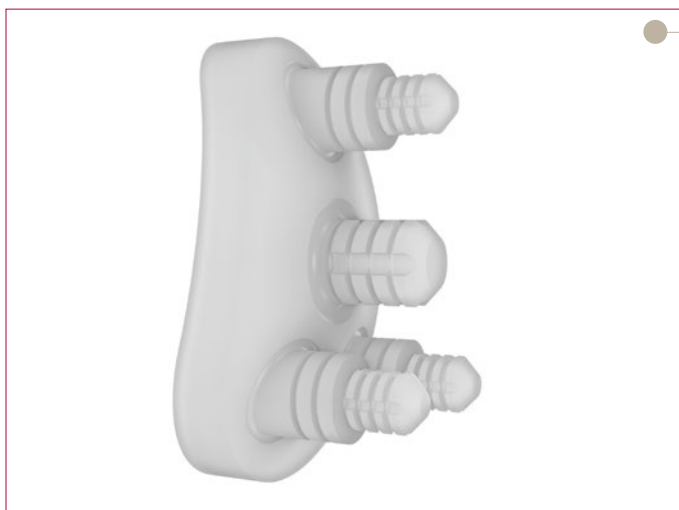


Figure 17

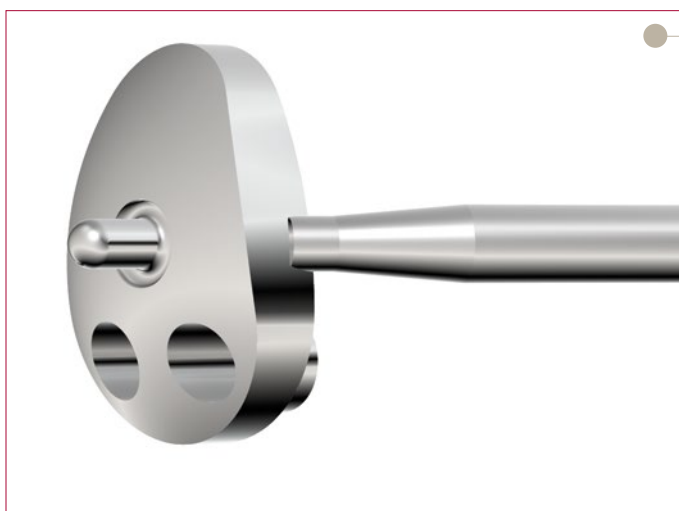


Figure 18

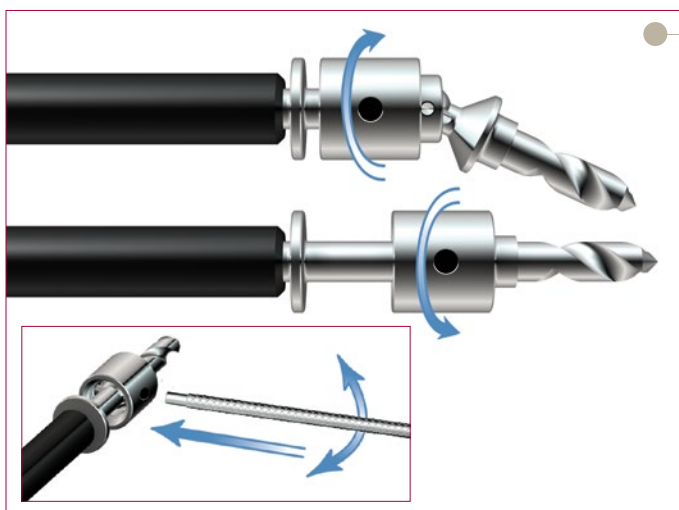


Figure 19

Pegged Glenoid Preparation

Glenoid Drilling

- ▶ The ReUnion Self-Pressurizing pegged and keeled glenoids require precise void preparations in order to be effectively implanted. Care must be taken to utilize the proper drill guides.
- ▶ The use of temporary peg locating pins is absolutely required and should not be ignored in order to properly prepare the bone voids.

- ▶ With the glenoid face fully contoured and checked for congruency, insert the central stabilization post of the drill guide head into the central reamer pilot hole.
- ▶ Rotate the guide around its central axis to properly orient the drill guide. The two (2) drill hole guides should now be on the inferior portion of the glenoid and guide.



Note:

Drill guide pilot posts are intentionally designed for a precise fit to the prepared central holes in order to achieve and maintain precision in preparation of the glenoid drill holes.

- ▶ The ReUnion TSA variable angle drills are convertible instruments allowing for both fixed angle and variable angle use.
- ▶ To use the drill driver in variable angled mode, loosen the drill bit by tightly grasping the metal collar and slowly activating the drill in REVERSE mode. The cone shaped end of the drill bit will now be outside of the metal sleeve (Figure 15, Top).
- ▶ To use the drill driver in a straight or fixed angle mode, tighten the drill bit by tightly grasping the metal sleeve and slowly activating the drill in FORWARD mode. The cone shaped end of the drill bit will sit flush to the metal sleeve (Figure 15, Bottom).



Note:

In those cases where the metal collar is difficult to grasp and use, the non-threaded end of the humeral version rod can be used as a breaker bar, when inserted into the hole on the collar (Figure 19 Inset).

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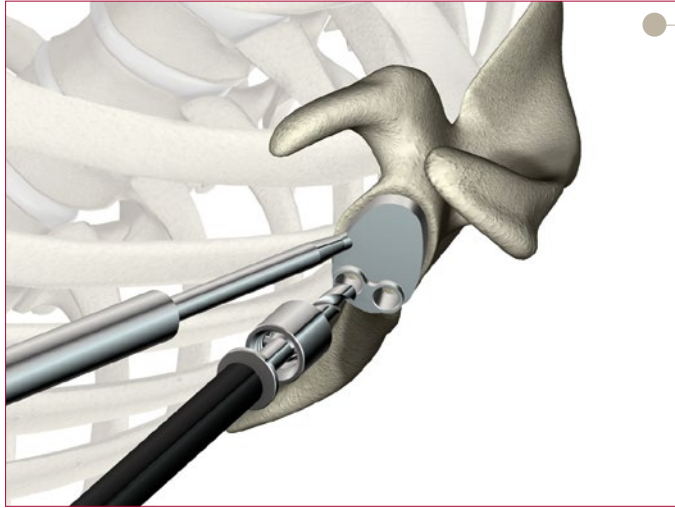


Figure 20

- ▶ Take the variable angle glenoid drill and drill the anterior-inferior hole until the drill bit is completely engaged and the drill bit's positive stop is in direct contact with the drill guide instrument.



Caution:

Prior to drilling, make sure the drill bit is fully seated within the drill guide as to prevent damage to the drill bit and/or drill guide.

Also make sure that the settings on power instruments are set for "DRILL" mode or be sure to utilize drill specific attachments for proper RPM and torque settings.

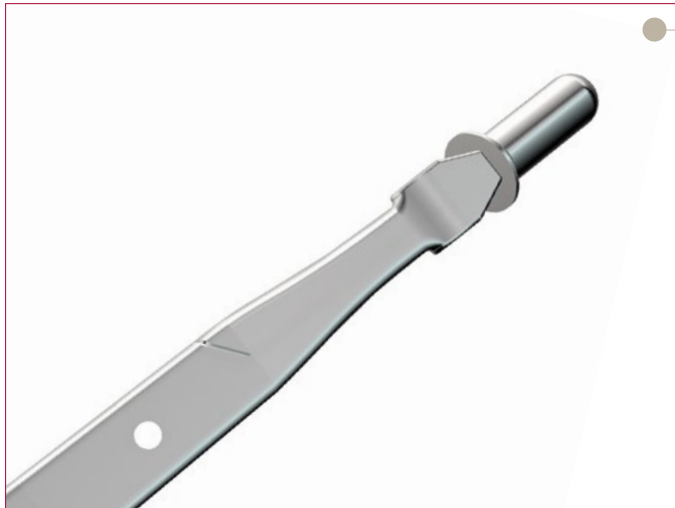


Figure 21

- ▶ Utilizing the peg locating pin forceps, place a temporary locating peg into the freshly prepared anterior-inferior hole prior to drilling the posterior-inferior hole for two-point fixation of the drill guide.

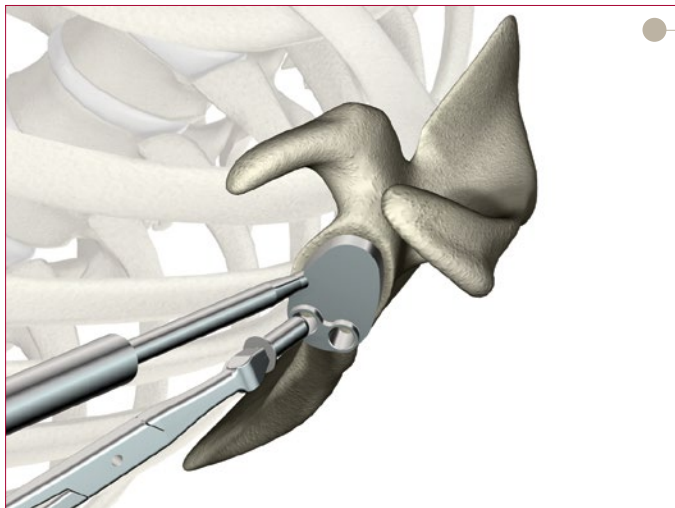


Figure 22

- ▶ Make sure the peg locating pin is fully seated within the drill guide prior to preparing the next (posterior-inferior) peg hole.

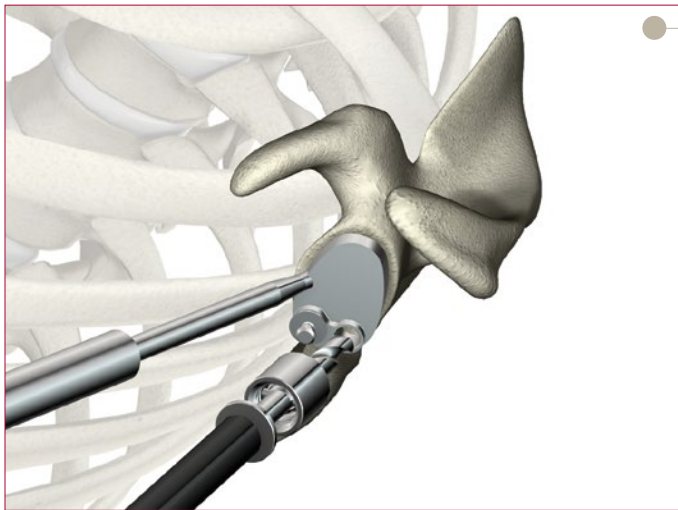


Figure 23

- ▶ Take the variable angle glenoid drill and drill the posterior-inferior hole until the drill bit is completely seated within the drill guide and is in direct contact with the positive stop.



Tech Tip:

When drilling the posterior inferior peg hole, care must be taken to check the patient's posterior glenoid bone quality. Adequate soft tissue retraction is also required in order to obtain proper exposure.

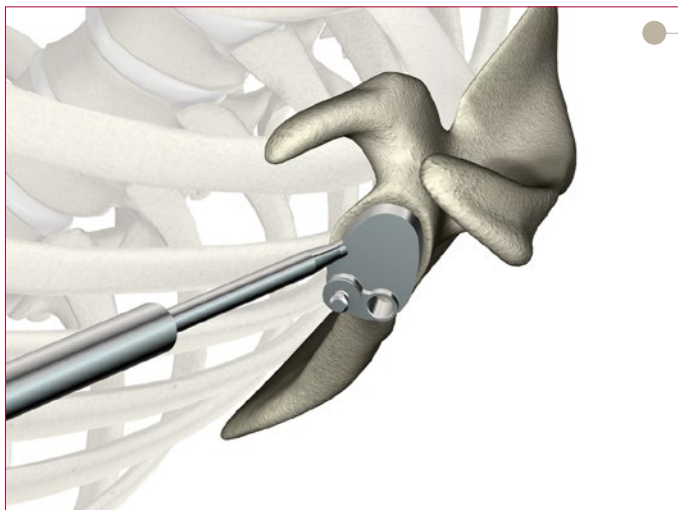


Figure 24

- ▶ Once the posterior-inferior hole has been drilled to the proper depth, use the peg locating pin forceps and remove the peg locating pin.

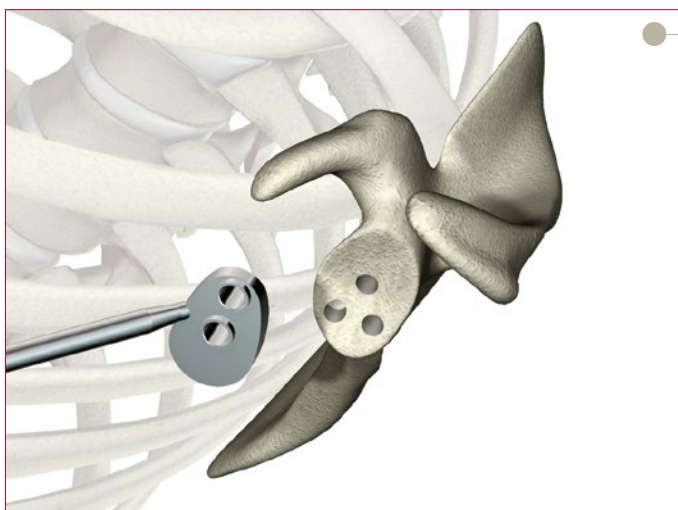


Figure 25

- ▶ Remove the drill guide and invert it, inserting the twin inferior posts into the two inferior drill holes.

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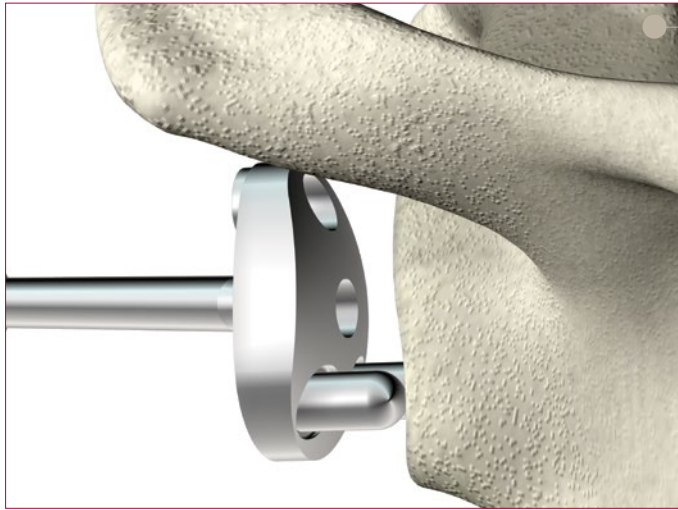


Figure 26



Warning:

Once the two pegs are inserted into the two recently prepared inferior holes, care should be taken not to use the long handle of the drill guide as leverage to alter the position of the scapula as it could possibly compromise the hole preparation and/or fracture the glenoid.

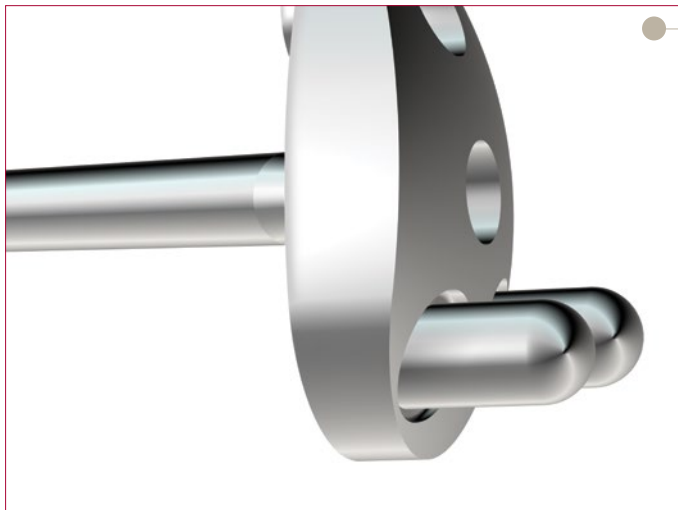


Figure 27

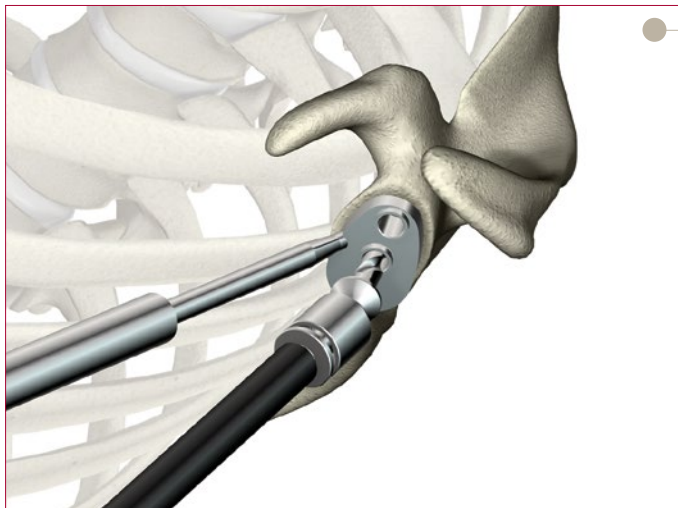


Figure 28

- ▶ After the two inferior posts are fully seated in the freshly prepared holes, re-drill the central hole.

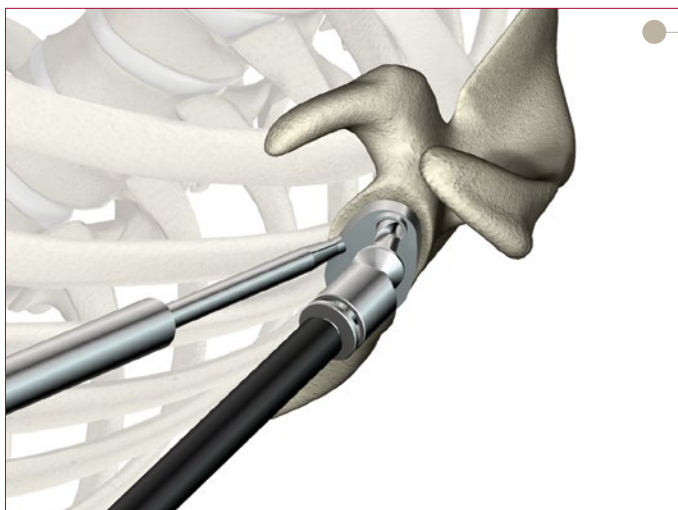


Figure 29

- ▶ Next, drill the superior peg hole and prepare to remove the drill guide.
- ▶ The drill guide should be removed by pulling along the hole axis and not by rocking the handle, as this may compromise the peg hole preparation.

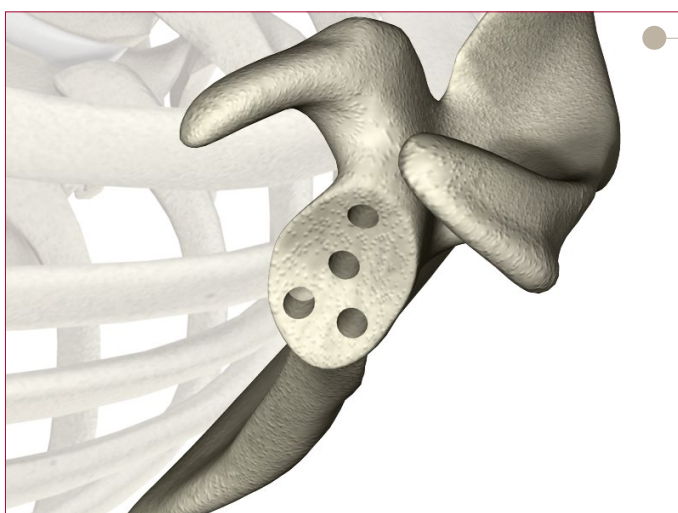


Figure 30

- ▶ Full evaluation of the prepared holes should be performed to make sure there are no perforations, which could potentially lead to cement extrusion.



Warning:

Do not ream the glenoid surface after the pegged and keeled glenoid holes have already been prepared as it may compromise the hole preparation and/or fracture the glenoid.

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Pegged
Glenoid Prep



Figure 31

Pegged Glenoid Preparation

Final Bone Preparation

- ▶ Assemble the peg alignment sound to the 4-sided ratcheting handle and make sure the two parts are securely engaged prior to use.

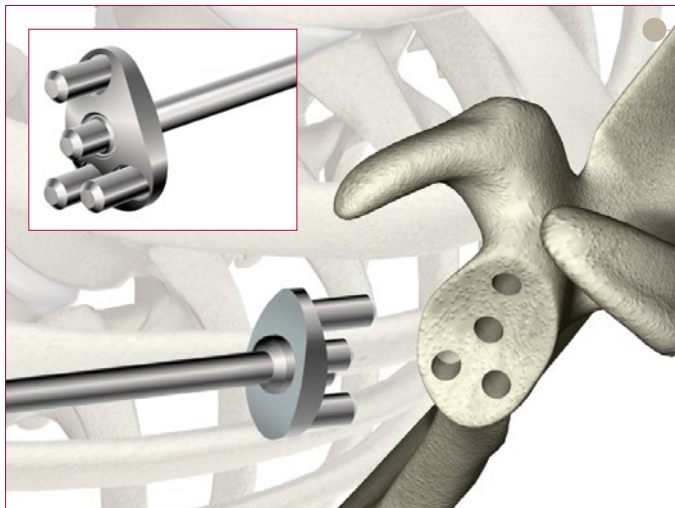


Figure 32

- ▶ The peg alignment sound and 4-sided handle assembly is introduced into the drill holes.

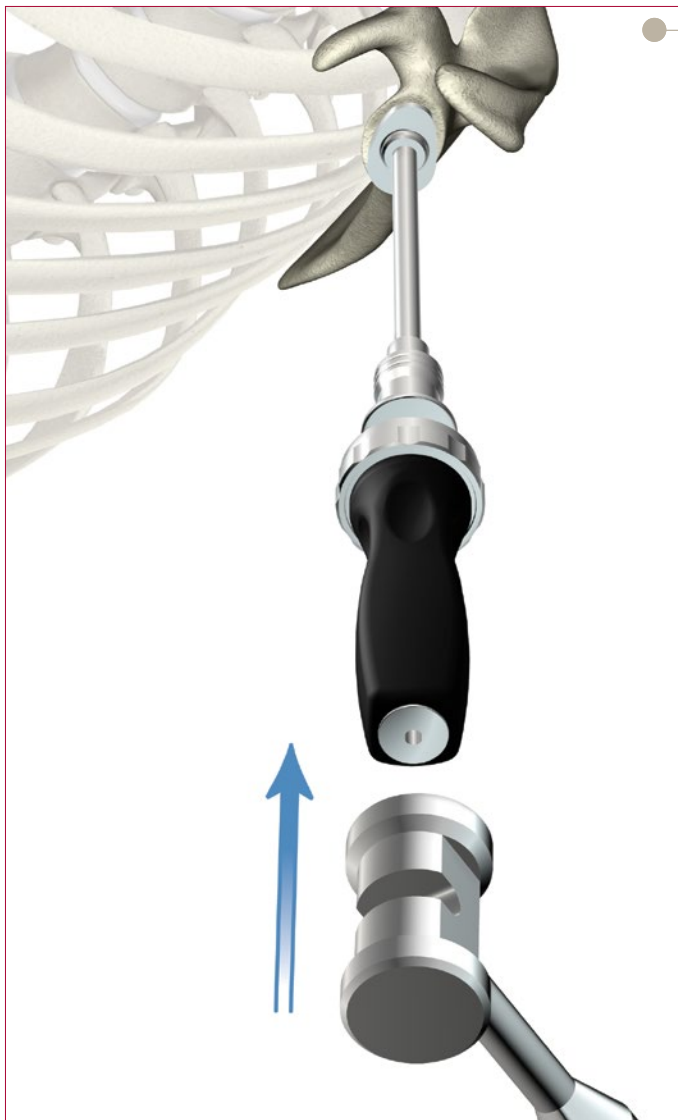


Figure 33

- ▶ The peg alignment sound should be seated in place and lightly tapped into final position using a mallet.



Warning:

Make sure to avoid excessive impaction as this may compromise the prepared drill holes.

- ▶ The body of the sound should bottom out flush to the glenoid bone.

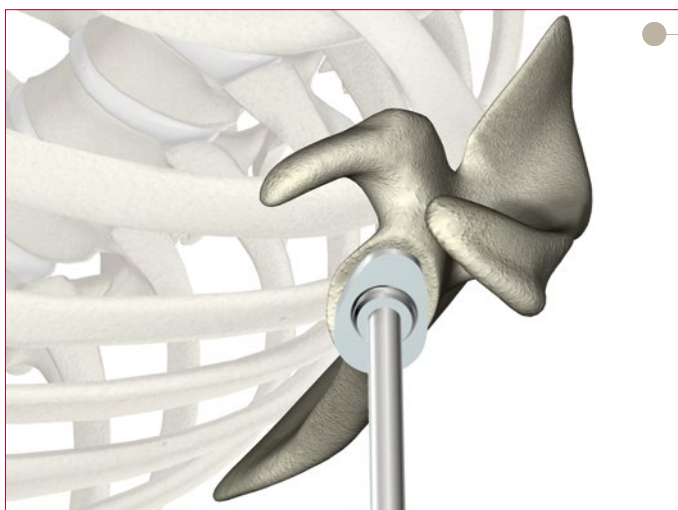


Figure 34

- ▶ Seating the sound assures that the holes are each deep enough to allow the implant to fully seat.



Warning:

Once all the pegs are inserted into the recently prepared holes, care should be taken not to use the long handle of the peg alignment sound as leverage to alter the position of the scapula as it may compromise the hole preparation and/or fracture the glenoid.

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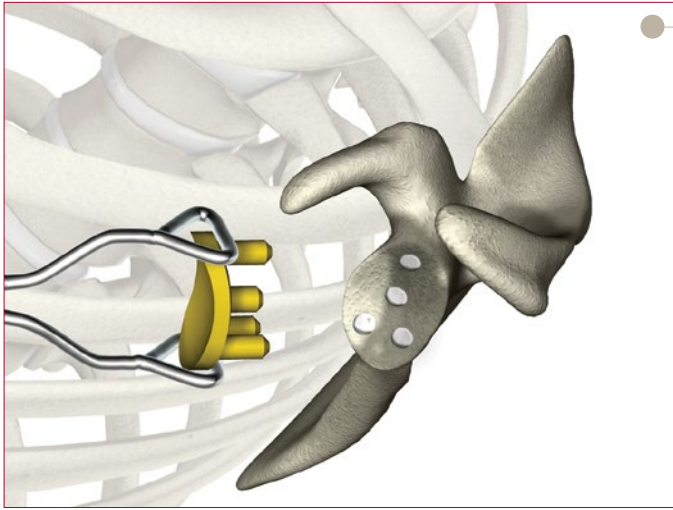


Figure 35

Pegged Glenoid Preparation

Pegged Glenoid Trial

- ▶ A color coded translucent plastic pegged glenoid trial should be inserted to check for depth and fit of the component relative to the prepared Bony void.

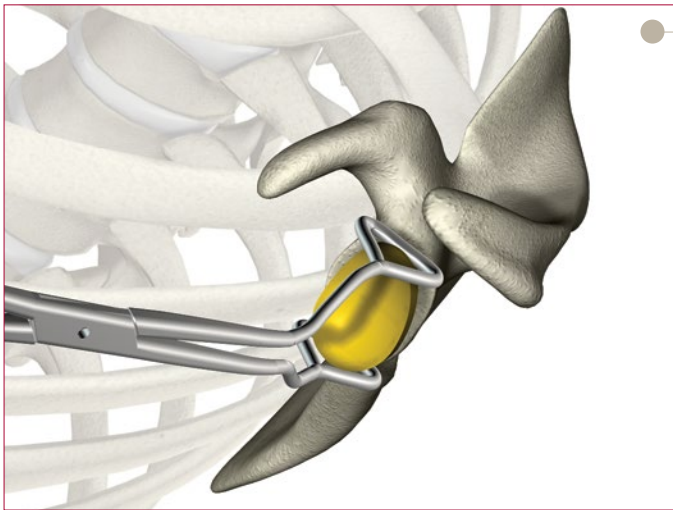


Figure 36

- ▶ The selected pegged glenoid trial is secured with the glenoid trial clamp and placed into the prepared holes, fully seating the trial.
- ▶ If trialing the entire total shoulder construct prior to cementing is preferred, the desired size single radius head trial can be placed on the humeral broach within the canal, and the fit of the construct can be assessed.

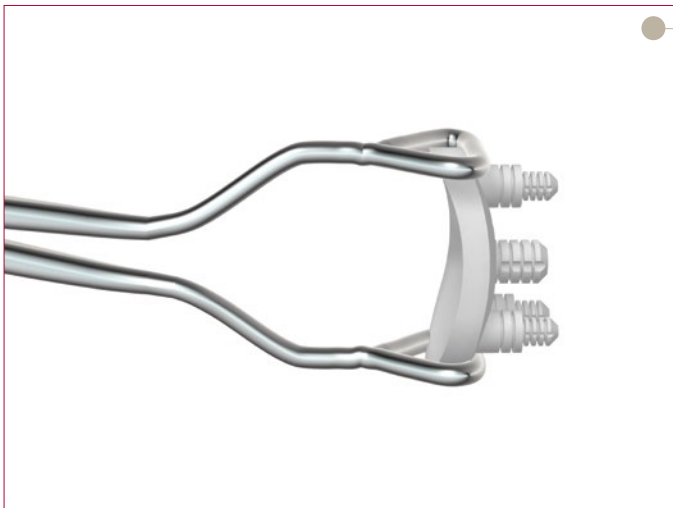


Figure 37

Pegged Glenoid Preparation

Cementing the Pegged Glenoid

- ▶ In preparation for cementation, epinephrine-soaked pledget-sponges can be packed into each of the drill holes for hemostasis. Alternatively, gelfoam or thrombin can be used as well. These are subsequently removed and holes are dried prior to insertion of cement.
- ▶ Cement is injected using a standard 10cc syringe into every prepared hole including the central peg. With the cement just slightly firmer than 'runny', it is easily injected into all of the prepared holes, filling each hole just below 'full'. Introduce the cement to all prepared bone and cement the glenoid in standard fashion.

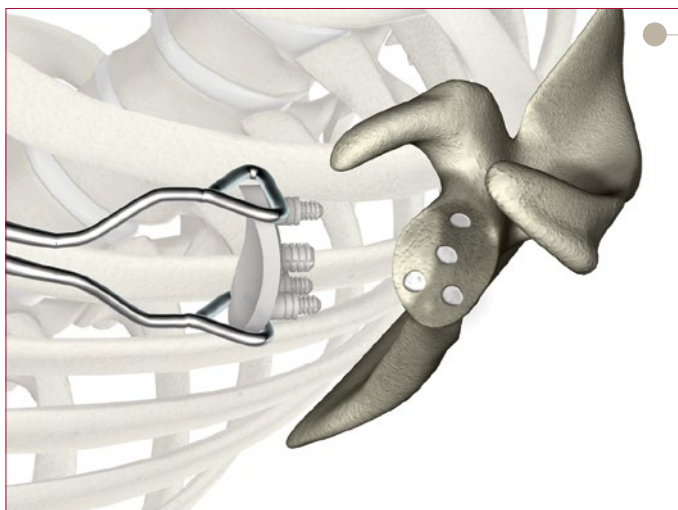


Figure 38

- The implant pegs are centered over the respective peg holes. The leading tips of the pegs easily enter into the holes by ‘feel’, an important feature since visualization of the holes at this point is difficult.



Note:

While the ReUnion SP Glenoid is designed to have cement injected into the prepared Bony voids, cement can be finger packed into the voids at the surgeon’s discretion.

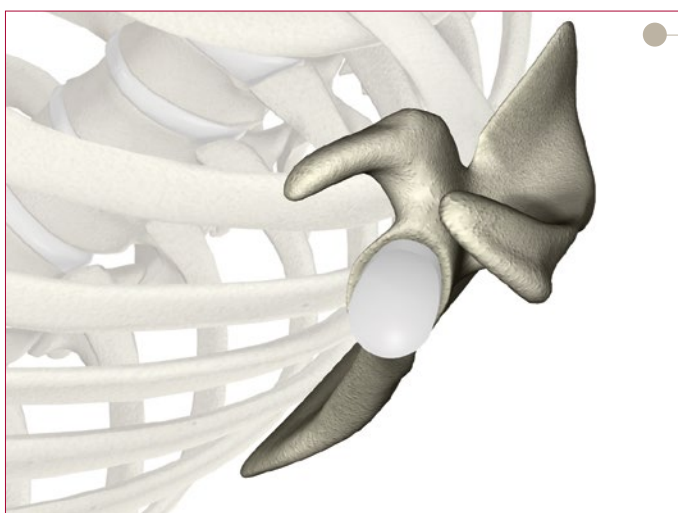


Figure 39

- Initially, the implant is manually placed with thumb pressure.

Color-Coded, Head/ Glenoid Trial Compatibility Table

Glenoid Size	Compatible Head Diameter (mm)	Humeral Head Thicknesses (mm)
40	40	14, 17, 20
	44	16, 19, 22
44	40	14, 17, 20
	44	16, 19, 22
	48	15, 18, 21, 24
48	44	16, 19, 22
	48	15, 18, 21, 24
	52	17, 20, 23, 26
52	48	15, 18, 21, 24
	52	17, 20, 23, 26
	56	19, 22, 25, 28
56	52	17, 20, 23, 26
	56	19, 22, 25, 28

Head/Glenoid Mismatch Example

Sizing Type	Glenoid Size	Humeral Head Size	Diametrical Mismatch (mm)
Standard	48	48	6
“One-up”	48	52	2
“One-down”	48	44	10

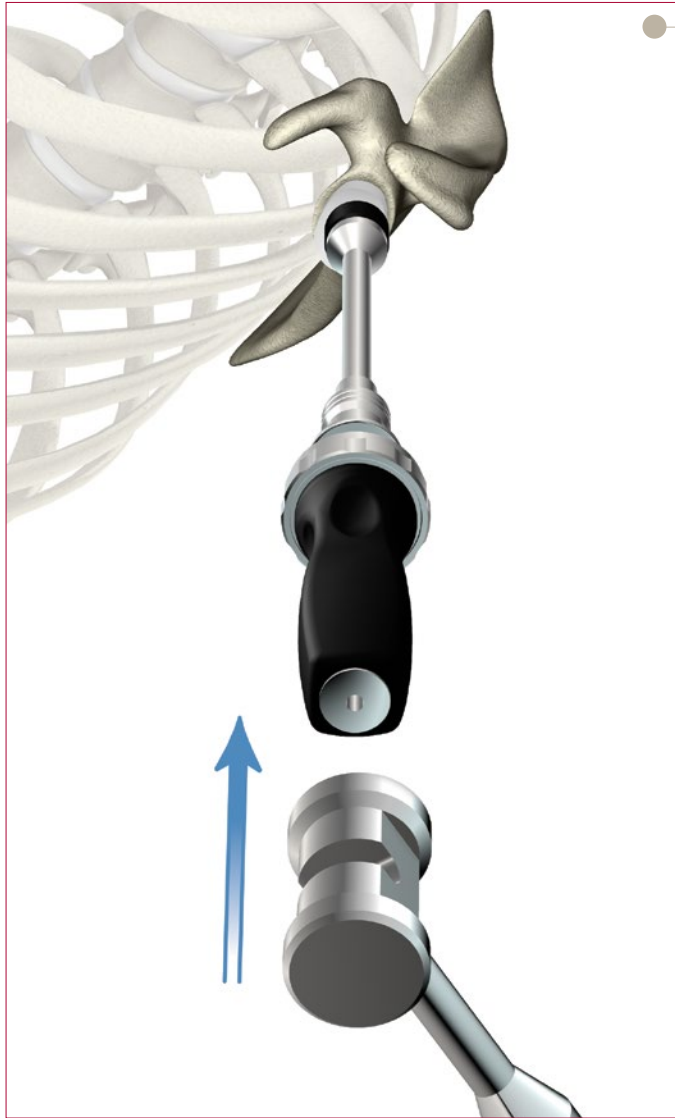
Humeral Head Sizes

Size (mm)	Thickness Options (mm)
40	14, 17, 20
44	16, 19, 22
48	15, 18, 21, 24
52	17, 20, 23, 26
56	19, 22, 25, 28

All humeral head sizes are available in both Concentric and Eccentric options.

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- ▶ The implant is definitively seated and 'bottomed-out' with several blows of the mallet onto the 4 sided modular handle attached to the glenoid impactor tool.
- ▶ If there is any peripheral cement that happens to extrude, it is cleared using a fine elevator.
- ▶ Pressure should be maintained on the prosthesis until the cement has fully hardened.

Figure 40



Figure 41

Keeled Glenoid Preparation

Glenoid Drilling

- ▶ The ReUnion Self-Pressurizing Pegged and Keeled Glenoids require precise void preparations in order to effectively be implanted. Care must be taken to utilize the proper drill guides.
- ▶ The use of temporary peg locating pins is absolutely required and should not be ignored in order to properly prepare the bone voids.

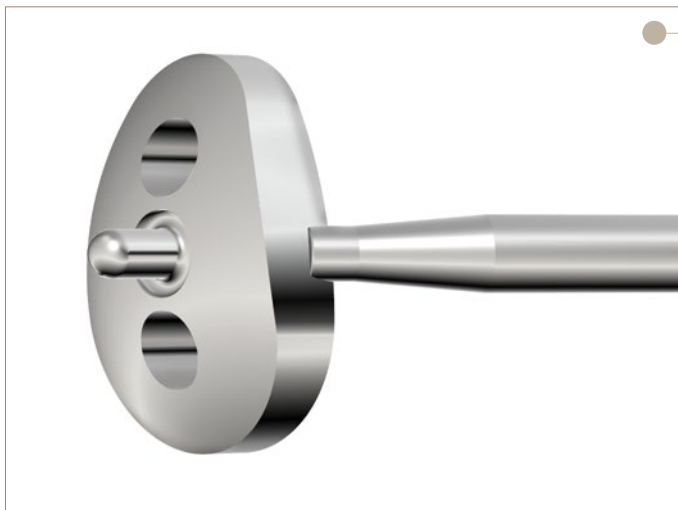


Figure 42

- ▶ With the glenoid face fully contoured and checked for congruency, insert the central stabilization post of the drill guide head into the central reamer pilot hole.
- ▶ Rotate the guide around its central axis to properly orient the drill guide. The two (2) drill hole guides should now be directly superior and inferior to the central peg.



Note:

Drill guide pilot posts are designed for a precise fit to the prepared central holes in order to achieve and maintain precision in preparation of the glenoid drill holes.

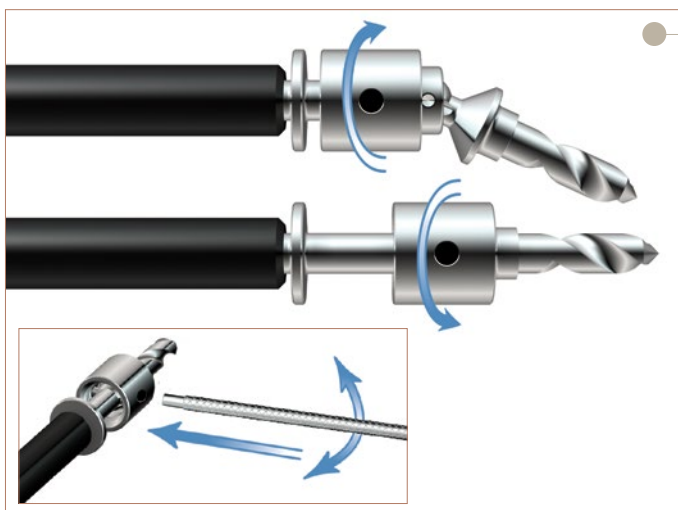


Figure 43

- ▶ The ReUnion TSA variable angle drills are convertible instruments allowing for both fixed angle and variable angle use.
- ▶ To use the drill driver in variable angled mode, loosen the drill bit by tightly grasping the metal collar and slowly activating the drill in REVERSE mode. The cone shaped end of the drill bit will now be outside of the metal sleeve (Figure 39, Top).
- ▶ To use the drill driver in a straight or fixed angle mode, tighten the drill bit by tightly grasping the metal sleeve and slowly activating the drill in FORWARD mode. The cone shaped end of the drill bit will sit flush to the metal sleeve (Figure 39, Bottom).



Note:

In those cases where the metal collar is difficult to grasp and use, the non-threaded end of the humeral version rod can be used as a breaker bar, when inserted into the hole on the collar (Figure 43 Inset).

ReUnion TSA

Glenoid Surgical Protocol

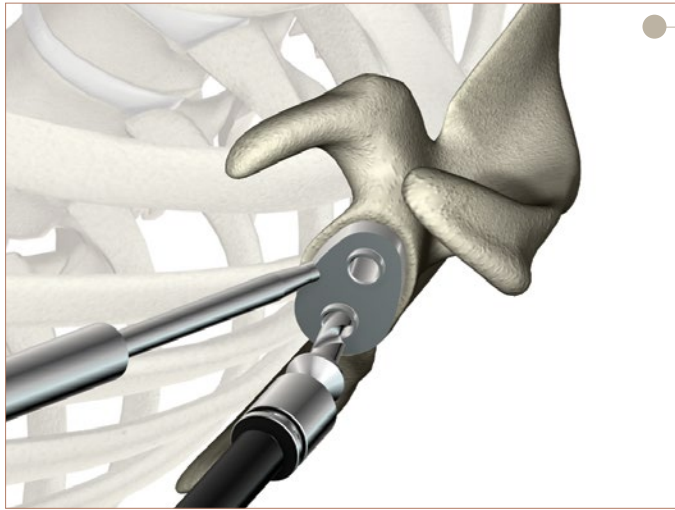


Figure 44

- ▶ Take the variable angle glenoid drill and drill the inferior hole until the drill bit is fully engaged and the drill bit's positive stop is in direct contact with the drill guide instrument.



Caution:

Prior to drilling, make sure the drill bit is fully seated within the drill guide as to prevent damage to the drill bit and/or drill guide.

Also make sure that the settings on power instruments are set for "DRILL" mode or be sure to utilize drill specific attachments for proper RPM and torque settings.

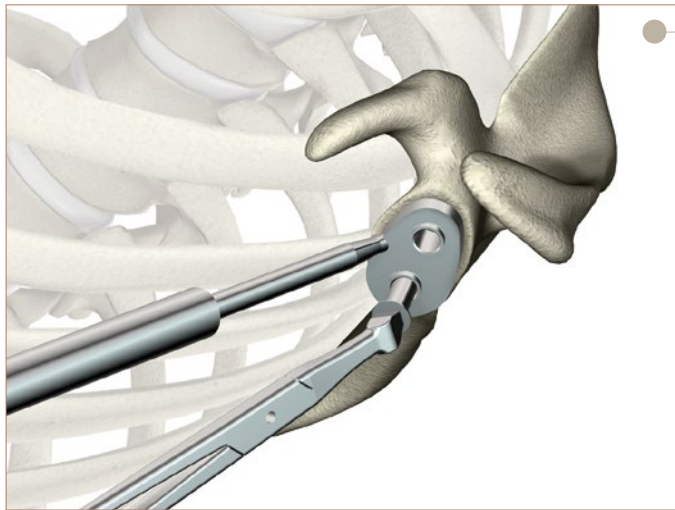


Figure 45

- ▶ Place a temporary peg locating pin into the newly drilled inferior hole to stabilize the drill guide's position while preparing the superior hole.

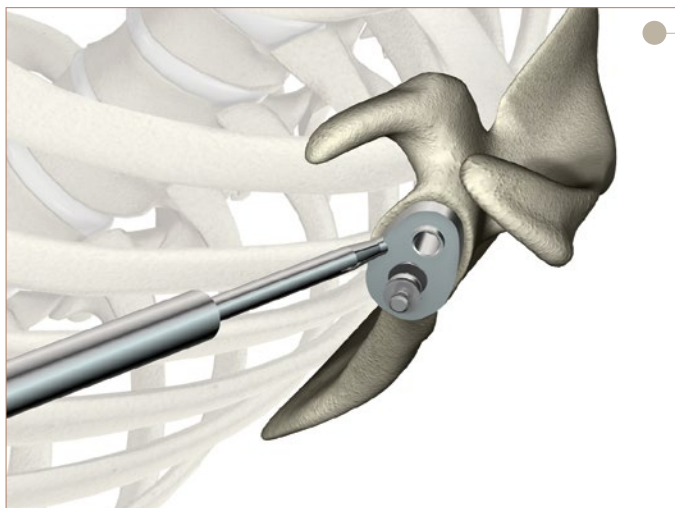


Figure 46

- ▶ The peg locating pin should be placed so that it is fully engaged within the drill guide, preventing any unnecessary movement of the drill guide itself.

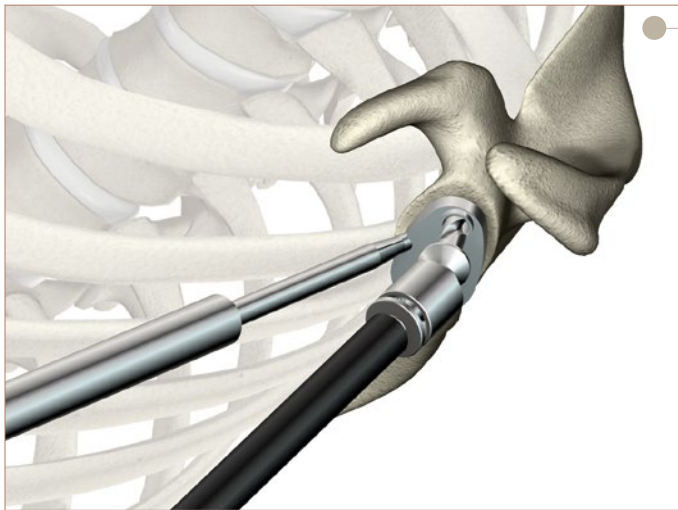


Figure 47

- ▶ Take the variable angle glenoid drill and drill the superior hole until the drill bit is completely engaged and the drill bit's positive stop is in direct contact with the drill guide instrument.

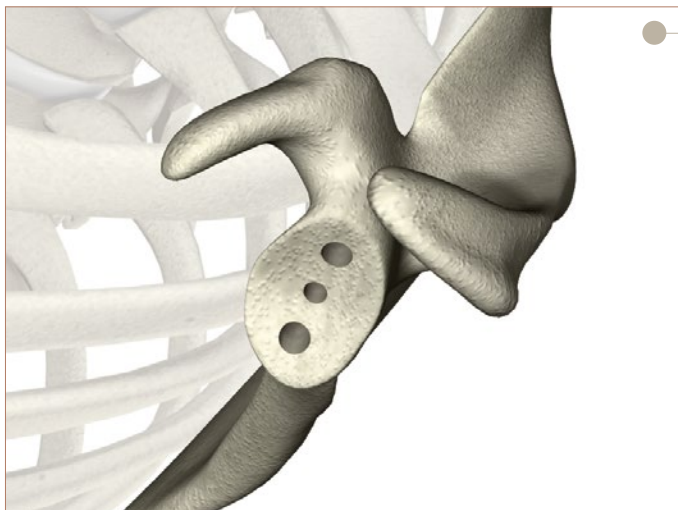


Figure 48

- ▶ Utilizing the peg locating pin forceps, remove the temporary peg locating pin and then remove the drill guide.

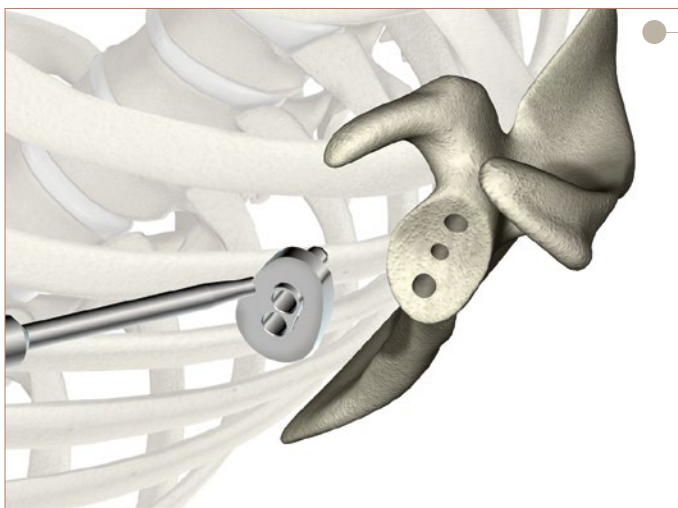


Figure 49

- ▶ The drill guide is inverted and the opposite end is now used to complete the drilling steps for keeled glenoid preparation.



Warning:

Once the pegs are inserted into the prepared superior and inferior holes, care should be taken not to use the long handle of the drill guide as leverage to alter the position of the scapula as it may compromise the hole preparation and/or fracture the glenoid.

ReUnion TSA

Glenoid Surgical Protocol

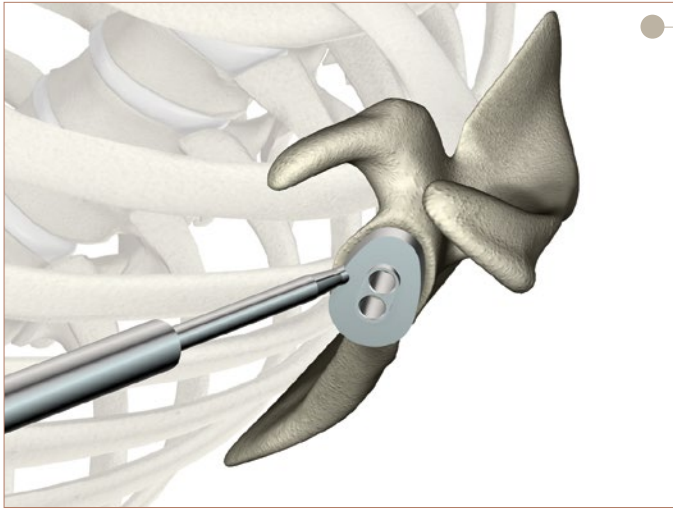


Figure 50

- ▶ Insert the two positive posts into the superior and inferior holes drilled in the previous step until the guide bottoms out on the glenoid and sits flush to the bone.

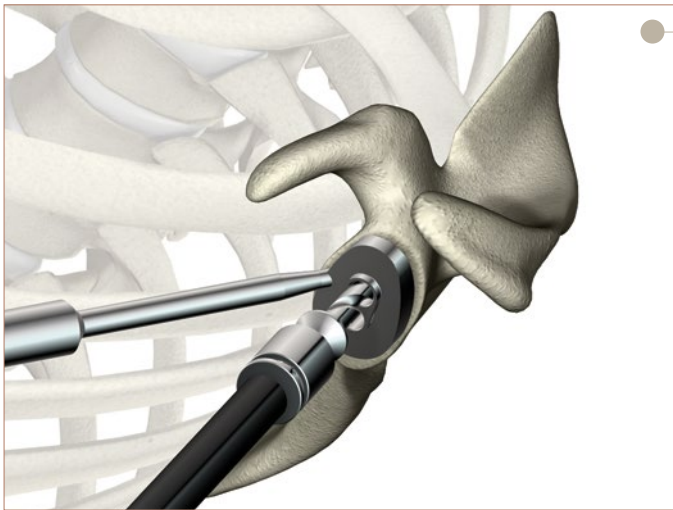


Figure 51

- ▶ Take the variable angle glenoid drill and drill the two central holes until the drill bit is completely engaged and the drill bit's positive stop is in direct contact with the drill guide instrument.
- ▶ The drill guide can now be removed.

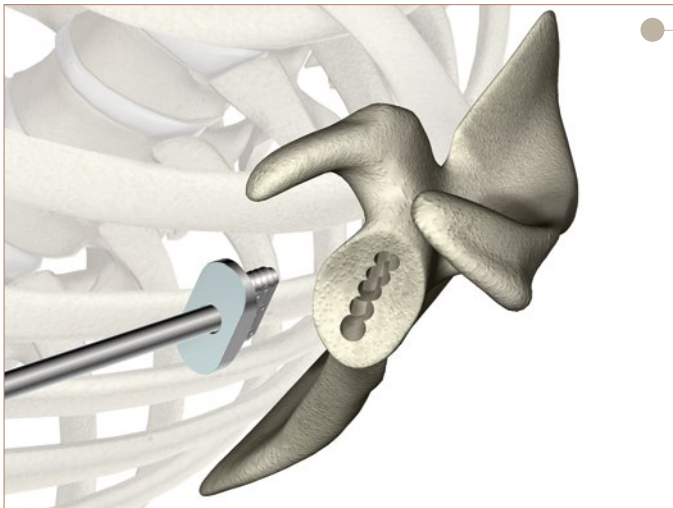


Figure 52

Keeled Glenoid Preparation

Final Bone Preparation

- ▶ The keeled glenoid punch is assembled to the 4-sided ratcheting handle and is introduced into the drill holes (Figure 48).



Figure 53

- ▶ The keel punch is impacted with a mallet until firmly seated (Figure 49). The body of the punch should bottom out flush to the glenoid bone with a tight fit.
- ▶ Seating the punch assures that the prepared void is deep enough to allow the implant to fully seat. A plastic trial glenoid implant is available to trial prior to cementing.



Warning:

Avoid excessive impaction as it may compromise the hole preparation and/or fracture the glenoid.

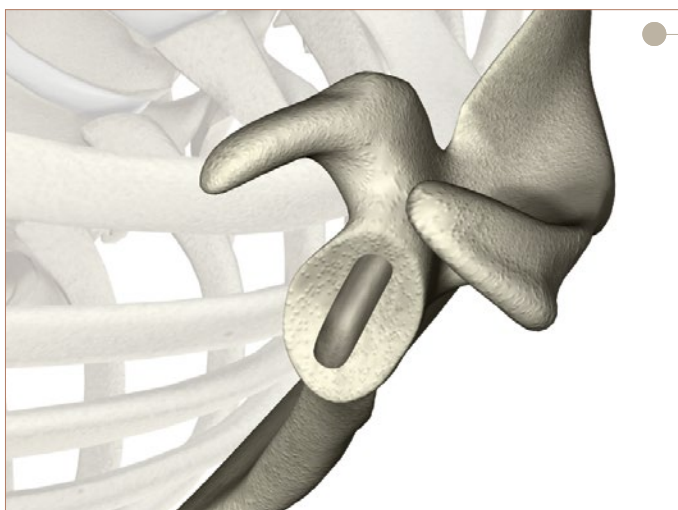


Figure 54

- ▶ Once the keel punch is removed, a precisely prepared bone void should be left behind.
- ▶ Full evaluation of the prepared keel void should be performed to make sure there are no perforations, which could potentially lead to cement extrusion.

ReUnion TSA

Glenoid Surgical Protocol

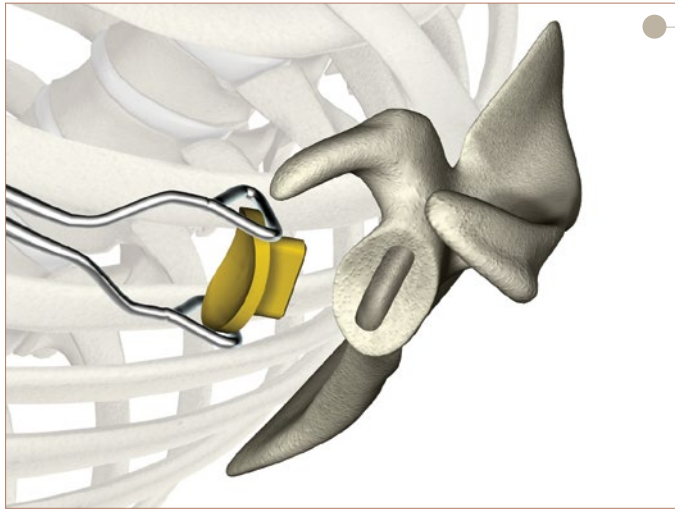


Figure 55

Keeled Glenoid Preparation

Keeled Glenoid Trial

- ▶ A color coded translucent plastic keeled glenoid trial should be inserted to check for depth and fit of the component relative to the prepared Bony void.

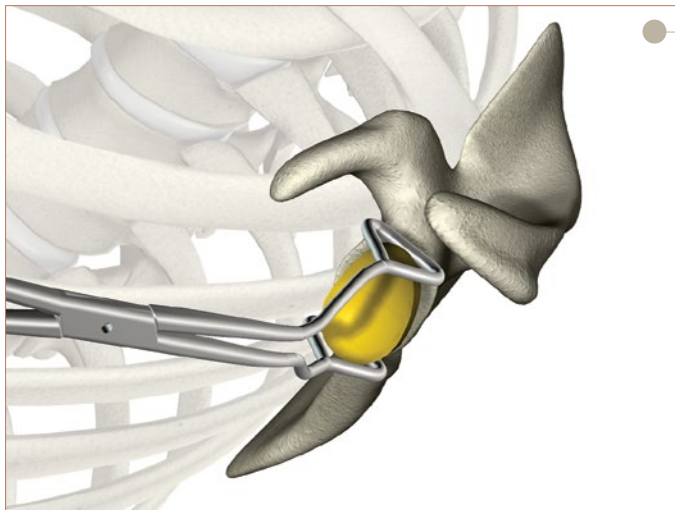


Figure 56

- ▶ If trialing the entire total shoulder construct prior to cementing is preferred, the desired size single radius head can be placed on the humeral broach within the canal, and the fit of the construct can be assessed.

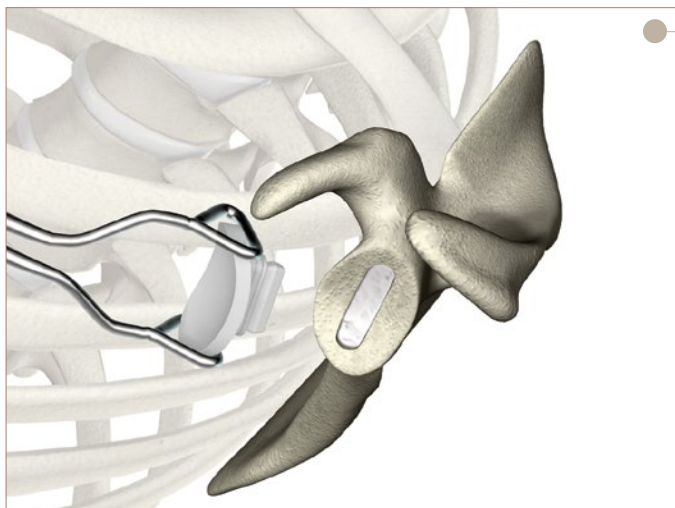


Figure 57

Keeled Glenoid Preparation

Cementing the Keeled Glenoid

- ▶ In preparation of bone cement, epinephrine-soaked pledget-sponges can be packed into the prepared Bony void for hemostasis. Alternatively, gelfoam or thrombin can be used as well. These are subsequently removed and the void is dried prior to insertion of cement.
- ▶ Cement is injected using a standard 10cc syringe. With the cement just slightly firmer than 'runny', it is easily injected into prepared void, filling the void just below 'full'. Introduce the cement to all prepared bone and cement the glenoid in standard fashion.

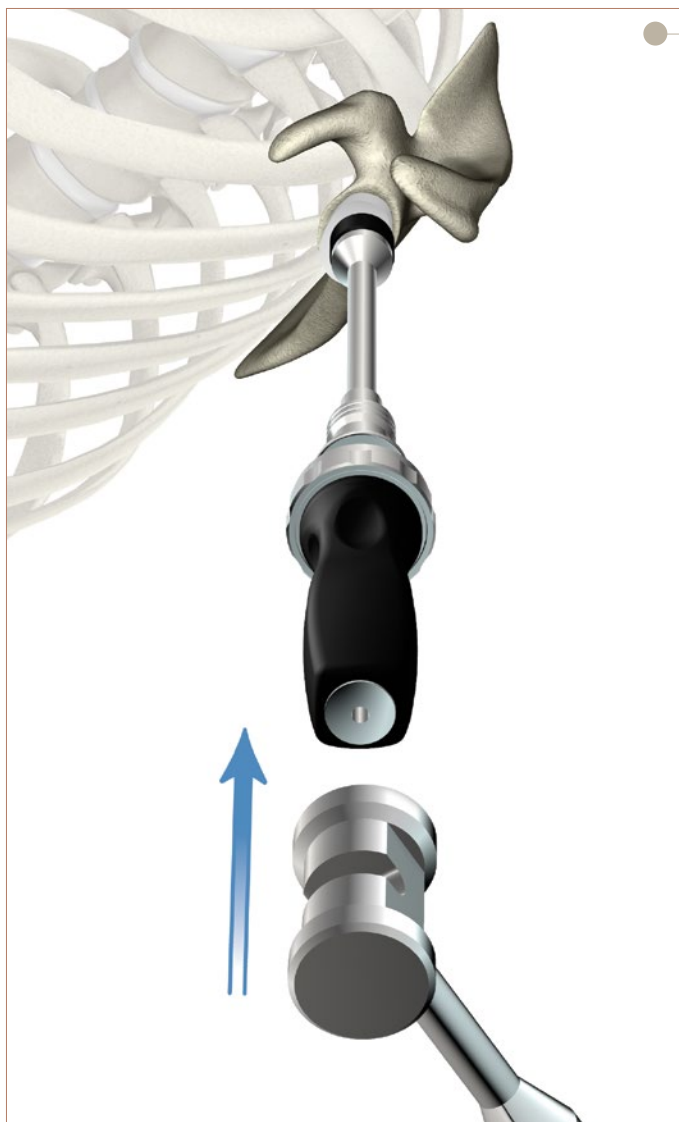


Figure 58

- ▶ The implant keel is centered over the prepared bone void. The leading tip of the keel easily enters into the void by 'feel'. The implant is started with thumb pressure.
- ▶ The implant is definitively seated and 'bottomed-out' with several blows of the mallet onto the 4 side modular handle attached to the glenoid impactor tool.
- ▶ If there is any peripheral cement that happens to extrude, it is cleared using a fine elevator.
- ▶ Pressure should be maintained on the prosthesis until the cement has fully hardened.

Color-Coded, Head/ Glenoid Trial Compatibility Table

Glenoid Size	Compatible Head Diameter (mm)	Humeral Head Thicknesses (mm)
40	40	14, 17, 20
	44	16, 19, 22
44	40	14, 17, 20
	44	16, 19, 22
	48	15, 18, 21, 24
48	44	16, 19, 22
	48	15, 18, 21, 24
	52	17, 20, 23, 26
52	48	15, 18, 21, 24
	52	17, 20, 23, 26
	56	19, 22, 25, 28
56	52	17, 20, 23, 26
	56	19, 22, 25, 28

Head/Glenoid Mismatch Example

Sizing Type	Glenoid Size	Humeral Head Size	Diametrical Mismatch (mm)
Standard	48	48	6
"One-up"	48	52	2
"One-down"	48	44	10

Humeral Head Sizes

Size (mm)	Thickness Options (mm)
40	14, 17, 20
44	16, 19, 22
48	15, 18, 21, 24
52	17, 20, 23, 26
56	19, 22, 25, 28

All humeral head sizes are available in both Concentric and Eccentric options.

ReUnion TSA

Glenoid Surgical Protocol

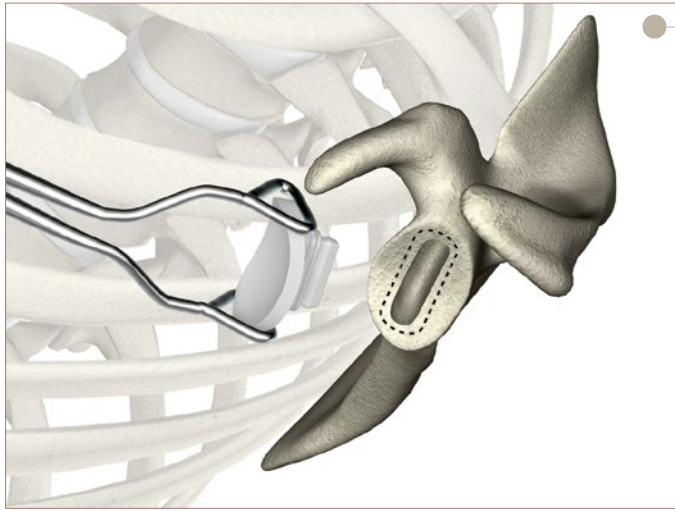


Figure 59

Keeled Glenoid Preparation

Fully Cemented SP Keel

- ▶ If presented with poor bone quality in the central region of the glenoid, the larger diameter area of the implant keel will not be properly supported.
- ▶ A burr can be used to remove approximately 1 mm of additional bone around the margins of the prepared void to cement the entire keeled construct, not utilizing the self-pressurizing features of the keel (Figure 55).

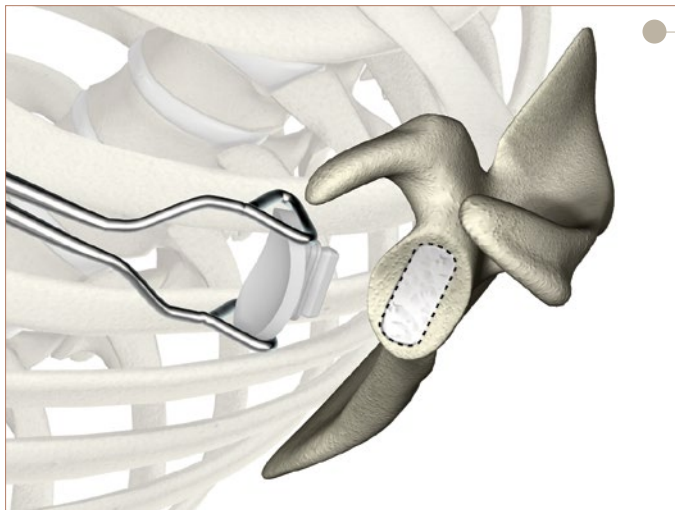


Figure 60

- ▶ Cement is injected using a standard 10cc syringe. With the cement just slightly firmer than 'runny', it is easily injected into prepared hole, filling the hole just below 'full'. Introduce the cement to all prepared bone and cement the glenoid in standard fashion.
- ▶ By not utilizing the self-pressurizing features of the glenoid, the surgeon must make sure to manually pressurize the cement in the Bony void prior to keeled glenoid insertion.



Tech Tip:

While the ReUnion SP Glenoid is designed to have cement injected into the prepared Bony void, cement can be finger packed into the void at the surgeon's discretion.

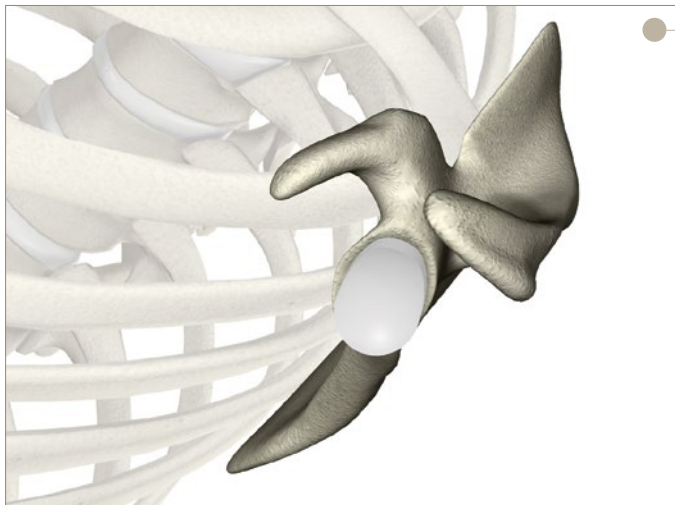


Figure 61

- ▶ Once the cement has been manually pressurized, the implant keel is centered over the prepared bone void. The leading tip of the keel is easily entered into the void by 'feel'.
- ▶ The implant is started with thumb pressure and should be held in place until the cement has fully hardened.



Note:

If there is any peripheral cement that happens to extrude, it is cleared using a fine elevator.



Figure 62

Humeral Head Trialing

Single Radius (SR) Heads

- ▶ The sizing of the modular head is important for success of this procedure. The previously resected head is compared with the modular trial head to determine both diameter and thickness and to help achieve the best soft tissue balance.
- ▶ When a glenoid is used, the joint line is lateralized so this additional space should be accounted for when selecting the humeral head implant's thickness (Figure 58).
- ▶ Consideration must also be given to head deformity and rotator cuff tensioning.

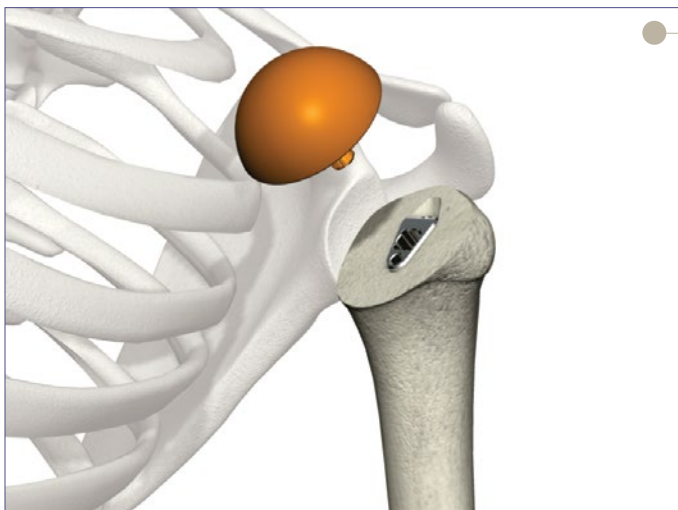


Figure 63

- ▶ With the proper modular head in place, it should be possible to achieve proper tensioning of the rotator cuff tendons, have a good match to anterior/posterior humeral width, and have the top of the modular head be equal to or slightly superior to the greater tuberosity.
- ▶ It should also enable 50% translation of the humeral head on the glenoid both anteriorly and posteriorly, enable internal rotation with the forearm across the abdomen, and also enable 30° – 40° external rotation.
- ▶ Place the selected humeral head trial into the mating feature of the broach or stem.
- ▶ The height of the modular head should be at or greater than that of the greater tuberosity.
- ▶ Additionally, inspect the glenoid to see if the degree of retroversion requires adjustment.

ReUnion TSA

Glenoid Surgical Protocol

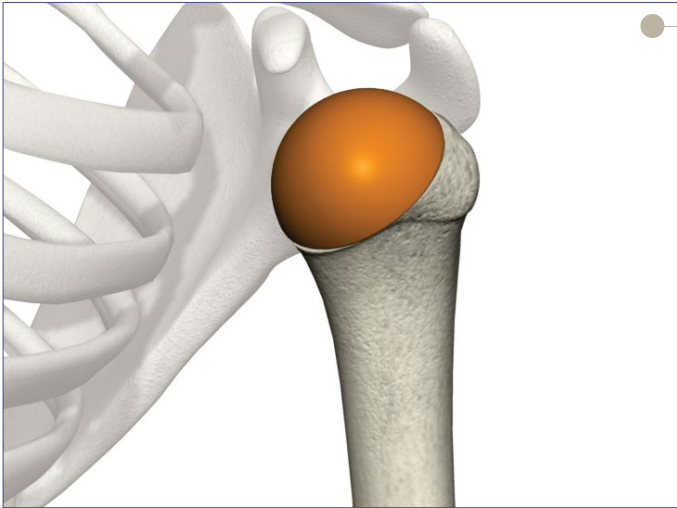


Figure 64

Head/Glenoid Mismatch Example

Sizing Type	Glenoid Size	Humeral Head Size	Diametrical Mismatch (mm)
Standard	48	48	6
“One-up”	48	52	2
“One-down”	48	44	10

Humeral Head Sizes

Size (mm)	Thickness Options (mm)
40	14, 17, 20
44	16, 19, 22
48	15, 18, 21, 24
52	17, 20, 23, 26
56	19, 22, 25, 28

All humeral head sizes are available in both Concentric and Eccentric options.

Color-Coded, Head/ Glenoid Trial Compatibility Table

Glenoid Size	Compatible Head Diameter (mm)	Humeral Head Thicknesses (mm)
40	40	14, 17, 20
	44	16, 19, 22
44	40	14, 17, 20
	44	16, 19, 22
	48	15, 18, 21, 24
48	44	16, 19, 22
	48	15, 18, 21, 24
	52	17, 20, 23, 26
52	48	15, 18, 21, 24
	52	17, 20, 23, 26
	56	19, 22, 25, 28
56	52	17, 20, 23, 26
	56	19, 22, 25, 28

Eccentric Single Radius (SR) Heads

- If a standard humeral head does not adequately cover the resected surface of the humerus, an eccentric head, with its 4mm offset, should allow the head to be rotated into the correct position to allow for maximum coverage.



Figure 65

Humeral Head Implantation

Single Radius (SR) Heads

- Thoroughly clean, dry and inspect the reverse Morse taper on the implanted ReUnion TSA stem.

Note:

It is critical to ensure that all tapers are clean, dry and clear of any debris or damage prior to assembling the humeral head to the stem.

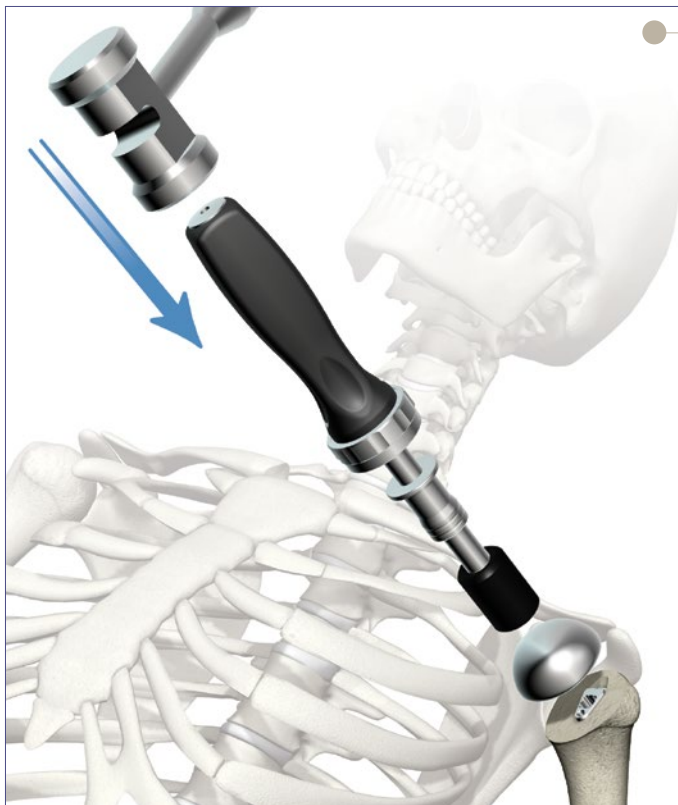


Figure 66

- ▶ Select the correct sized head as previously trialed and place the humeral head on the humeral stem.
- ▶ Several mallet blows are used to definitively seat the humeral head. Be sure that the angle of the ratcheting handle and impactor tool is in line with the axis of the tapers (90° to collar face).



Tech Tip:

- Internal rotation of the arm with the elbow flexed 90° to the abdomen without undue tension on the posterior capsule.
- External rotation to 40°–45° while being able to bring the anterior capsular structures back to their original site of release.
- External rotation to 90° without dislocation of the humeral head on the glenoid.
- 50% translation of the humeral head on the glenoid both anteriorly and posteriorly with a slight inferior translation.
- The height of the modular head should be at or greater than that of the greater tuberosity.
- Additionally, inspect the glenoid to see if the degree of retroversion requires adjustment.

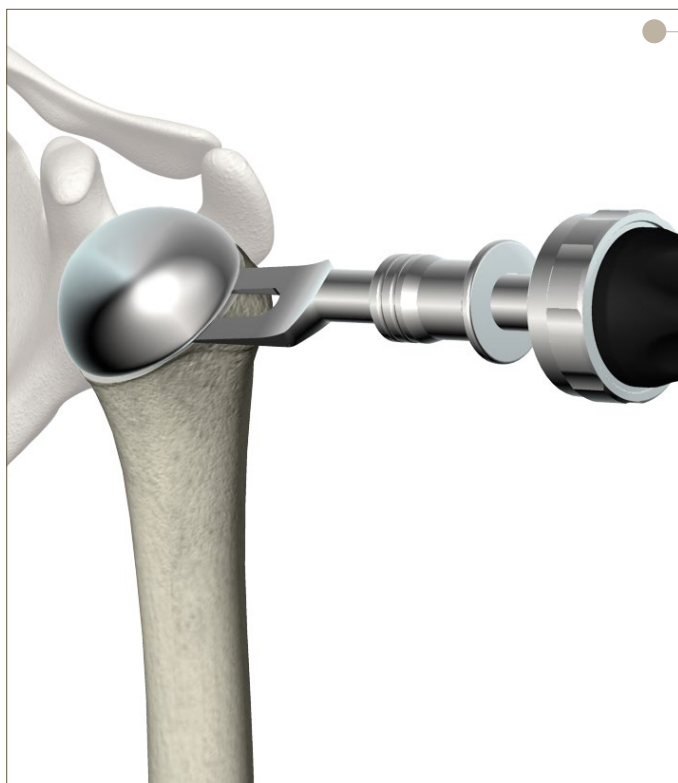


Figure 67

Component Removal

Humeral Head Removal

- ▶ Attach the forked removal tool to the 4-sided ratcheting handle and slide the forked humeral head removal tool under the humeral head.
- ▶ Align the forked removal tool to the neck of the head and lightly tap the forked tool in with a mallet to mechanically disassociate the humeral head from the humeral stem.
- ▶ If the head is in direct contact with the bone, the surgeon may need to create a small window along the edge of the resection to obtain access for insertion of the fork.



Warning:

Be careful not to pry or lever off the cortical rim to remove head as this may cause a fracture.

Excessive impaction of the forked removal tool should be avoided as this may damage the cortical rim of the humerus.



Caution:

The ReUnion TSA forked removal tool should only be used with the ReUnion TSA Universal Neck Adapter or ReUnion SR heads.

ReUnion TSA

Glenoid Surgical Protocol



Figure 68

Humeral Head Trialing

Dual Radius (DR) Humeral Heads

- ▶ The sizing of the modular head is important for success of this procedure. The previously resected head is compared with the modular trial head to determine both diameter and thickness.
- ▶ When a glenoid is used, this lateralizes the joint line so the humeral head thickness will be 4mm less than the resected head.
- ▶ With the proper modular head in place, it should be possible to achieve proper tensioning of the rotator cuff tendons, have a good match to anterior/posterior humeral width, and have the top of the modular head be equal to or slightly superior to the great tuberosity.

It should also enable 50% translation of the humeral head on the glenoid both anteriorly and posteriorly, enable internal rotation with the forearm across the abdomen, and also enable 30° – 40° external rotation.

- ▶ Additionally, inspect glenoid to see if you need to alter degree of retroversion.



Figure 69

- ▶ Thoroughly clean and inspect the broach taper, making sure it is clear of any debris. Select a Modular Neck Trial and insert the smaller taper into the negative taper of the broach.
- ▶ Now select a Dual Radius Head Trial and place it onto the larger exposed taper.
- ▶ Reduce the joint and evaluate range of motion and stability to confirm component sizes.
- ▶ Remove Head Trial and Modular Neck Trial using the Forked Removal Tool.



Figure 70

Back-table Humeral Head Assembly

Dual Radius (DR) Humeral Heads

- ▶ After completion of humeral head trialing. Select a Modular Neck Adapter implant and appropriate DR head for implantation.
- ▶ Place the selected DR humeral head into the head/neck assembly block and then place the modular neck adapter implant into the humeral head.



Figure 71

- ▶ Attach the universal impactor tool to the ratcheting 4-sided handle and definitively impact the neck adapter into the DR head with several blows.

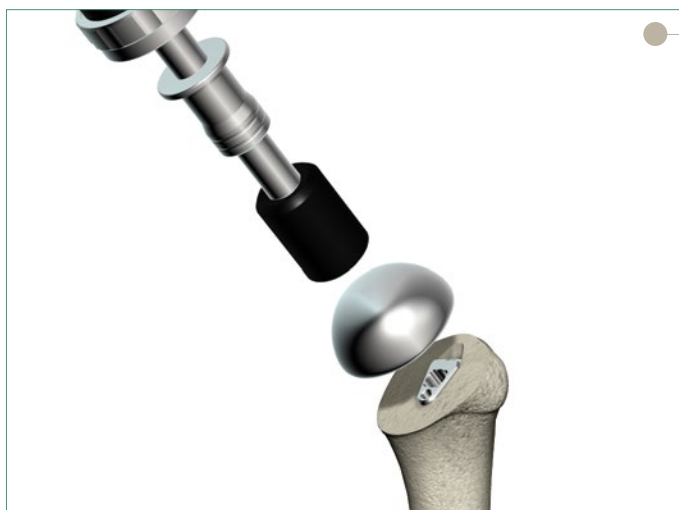


Figure 72

- ▶ Place the constructed DR Head/Modular Neck assembly into humeral stem.
- ▶ Several mallet blows are used to definitely seat the humeral head/neck construct. Be sure that the angle of the ratcheting handle and impactor tool is in line with the axis of the tapers (90° to collar face).

ReUnion TSA

Glenoid Surgical Protocol



Figure 73

Disassembly of Spherical Glenoid Reamers

- The recommended method to disassemble the Spherical Glenoid Reamers from the Straight Reamer Driver is by utilizing the Glenoid Holder instrument to grasp around the circumference of the reamer.

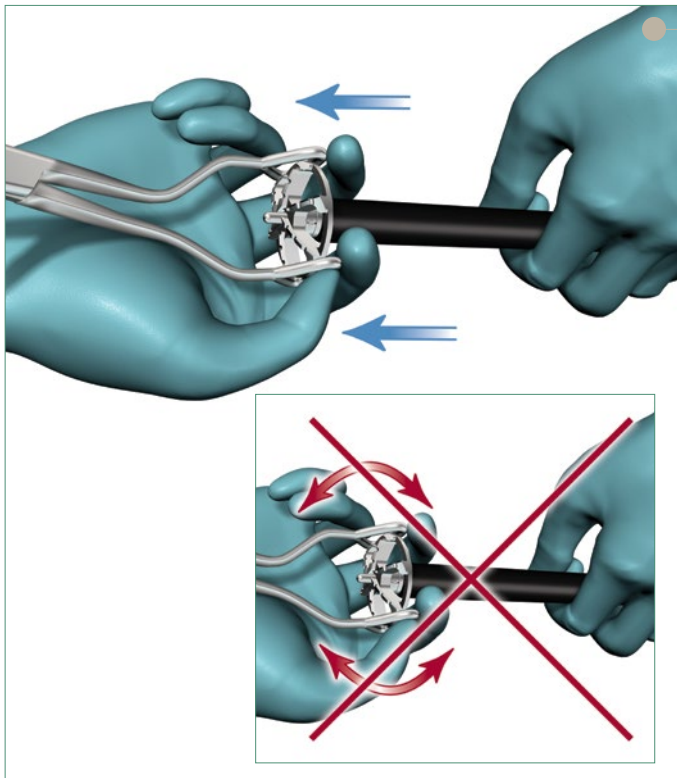


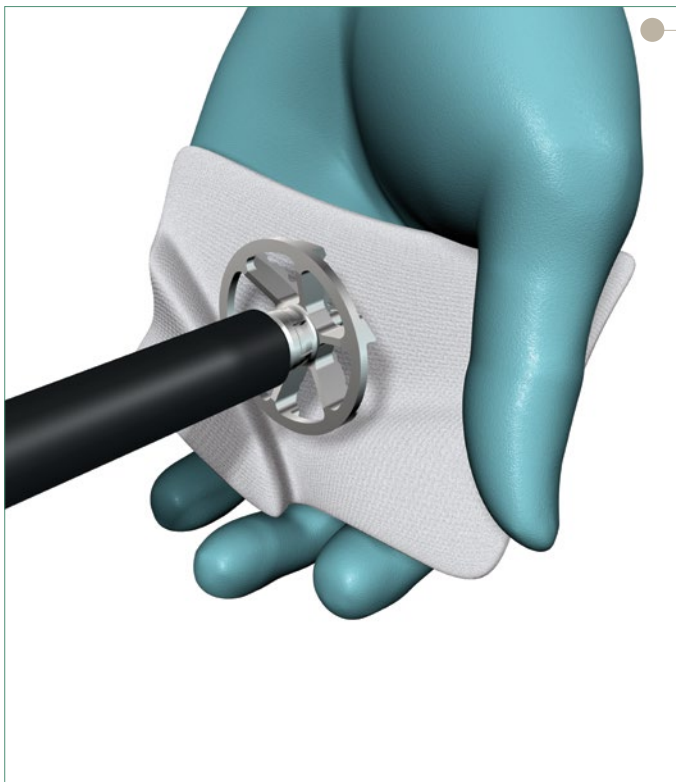
Figure 74

- By holding the reamer face as shown (Figure 70) with the Glenoid Holder, pull the reamer face away from Straight Reamer Driver in an axial direction to disengage the quick connect feature.



Warning:

Be careful not to toggle the reamer during disassembly as this has the potential to compromise the quick connect mechanism.



- If attempting to remove the Spherical Glenoid Reamer without use of the Glenoid Holder instrument, it is recommended the user utilize gauze or another material to protect their hands from blades of the reamer.

Figure 75

ReUnion TSA

Glenoid Surgical Protocol

Catalog #	Description	Size	Quantity
ReUnion TSA - Humeral Case 1 [5901-1200]			
5900-0040	Slotted Mallet		1
5901-1102	6mm Starter Awl		1
5901-1103	Version Rod		1
5901-1104	Intramedullary (IM) Resection Guide Assembly		1
5901-1105	IM Resection Block		1
5901-1107	Clamp Tower		1
5901-1111	Extramedullary (EM) Resection Guide Assembly		1
5901-1121	Modular Ratcheting T-handle		1
5901-1174	Humeral Head Retractor		1
5901-2007	Fluted Cylindrical Reamer	7mm	1
5901-2008	Fluted Cylindrical Reamer	8mm	1
5901-2009	Fluted Cylindrical Reamer	9mm	1
5901-2010	Fluted Cylindrical Reamer	10mm	1
5901-2011	Fluted Cylindrical Reamer	11mm	1
5901-2012	Fluted Cylindrical Reamer	12mm	1
5901-2013	Fluted Cylindrical Reamer	13mm	1
5901-2014	Fluted Cylindrical Reamer	14mm	1
5901-2015	Fluted Cylindrical Reamer	15mm	1
5901-2016	Fluted Cylindrical Reamer	16mm	1
5901-2017	Fluted Cylindrical Reamer	17mm	1
6541-4-003A	Fluted Headless Pins	Length = 3"	4
6633-7-605	Headless Pin Puller		1
7551-0000	Blade Runner		1
7650-1035	Headless Pin Driver		1

Catalog #	Description	Size	Quantity
ReUnion TSA - Humeral Case 2 [5901-1202]			
5901-1007	Humeral Broach	7mm	1
5901-1008	Humeral Broach	8mm	1
5901-1009	Humeral Broach	9mm	1
5901-1010	Humeral Broach	10mm	1
5901-1011	Humeral Broach	11mm	1
5901-1012	Humeral Broach	12mm	1
5901-1013	Humeral Broach	13mm	1
5901-1014	Humeral Broach	14mm	1
5901-1015	Humeral Broach	15mm	1
5901-1016	Humeral Broach	16mm	1
5901-1017	Humeral Broach	17mm	1
5901-1130	Broach Handle/Stem Inserter		1
5901-1131	Fixed Height Adapter		1
5901-1141	Humeral Protector Plate	Small	1
5901-1143	Humeral Protector Plate	Large	1
5901-1180	Calcar Planer	Small	1
5901-1182	Calcar Planer	Large	1

ReUnion TSA

Glenoid Surgical Protocol

Catalog #	Description	Size	Quantity
ReUnion TSA - Humeral Case 3 [5901-1203]			
5901-1120	4-Sided Modular Ratcheting Handle		1
5901-1130	Broach Handle/Stem Inserter		1
5901-1170	Universal Impactor Adapter		1
5901-1171	Universal Impactor Tip		1
5901-1172	Modular Neck Adapter Trial		2
5901-1173	Humeral Head/Neck Assembly Block		1
5901-1186	Forked Removal Tool		1
5901-1187	Humeral Stem Extractor		1
5901-E-40X	Size 40, Eccentric SR Humeral Head Trial	X = 14, 17, and 20	1 each size
5901-E-44X	Size 44, Eccentric SR Humeral Head Trial	X = 16, 19, and 22	1 each size
5901-E-48X	Size 48, Eccentric SR Humeral Head Trial	X = 15, 18, 21, and 24	1 each size
5901-E-52X	Size 52, Eccentric SR Humeral Head Trial	X = 17, 20, 23, and 26	1 each size
5901-E-56X	Size 56, Eccentric SR Humeral Head Trial	X = 19, 22, 25, and 28	1 each size
5901-S-40X	Size 40, Standard SR Humeral Head Trial	X = 14, 17, and 20	1 each size
5901-S-44X	Size 44, Standard SR Humeral Head Trial	X = 16, 19, and 22	1 each size
5901-S-48X	Size 48, Standard SR Humeral Head Trial	X = 15, 18, 21, and 24	1 each size
5901-S-52X	Size 52, Standard SR Humeral Head Trial	X = 17, 20, 23, and 26	1 each size
5901-S-56X	Size 56, Standard SR Humeral Head Trial	X = 19, 22, 25, and 28	1 each size

Catalog #	Description	Size	Quantity
ReUnion TSA - Glenoid Case 1 [5901-1208]			
5901-0020	Straight Reamer Driver		1
5901-0021	Angled Reamer Driver		1
5901-0024	Centering Drill Guide		1
5901-0025	Centering Drill		1
5901-0028	Peg/Keel Drill		2
5901-0029	Peg Locating Pin		2
5901-0030	Peg Locating Pin Holder		1
5901-0032	Glenoid Impactor Tip		1
5901-00X	Spherical Glenoid Reamer	X = 40, 44, 48, 52, and 56	1 each size
5901-0060	Glenoid Holder		1
5901-1026L	Pegged Drill Guide (LEFT)		1
5901-1026R	Pegged Drill Guide (RIGHT)		1
5901-1038	Peg Alignment Sound		1
5901-10X	Pegged Glenoid Surface Trial(s)	X = 40, 44, 48, 52, and 56	1 each size
5901-12X	Pegged Glenoid Trial(s)	X = 40, 44, 48, 52, and 56	1 each size
5901-2026L	Keeled Drill Guide (LEFT)		1
5901-2026R	Keeled Drill Guide (RIGHT)		1
5901-2038	Glenoid Impactor Shaft		1
5901-20X	Keeled Glenoid Surface Trial(s)	X = 40, 44, 48, 52, and 56	1 each size
5901-22X	Keeled Glenoid Trial(s)	X = 40, 44, 48, 52, and 56	1 each size
5901-2340	Keeled Glenoid Punch		1

ReUnion TSA

Glenoid Surgical Protocol

Catalog #	Description	Diameter (Distal)	Length
ReUnion TSA HA Coated Press-fit & Smooth/Uncoated Stems			
5569-0022	Modular Humeral Neck Adapter		
5569-P-2007	HA Coated Press-fit Humeral Stem	7mm	113mm
5569-P-2008	HA Coated Press-fit Humeral Stem	8mm	118mm
5569-P-2009	HA Coated Press-fit Humeral Stem	9mm	118mm
5569-P-2010	HA Coated Press-fit Humeral Stem	10mm	123mm
5569-P-2011	HA Coated Press-fit Humeral Stem	11mm	123mm
5569-P-2012	HA Coated Press-fit Humeral Stem	12mm	128mm
5569-P-2013	HA Coated Press-fit Humeral Stem	13mm	128mm
5569-P-2014	HA Coated Press-fit Humeral Stem	14mm	133mm
5569-P-2015	HA Coated Press-fit Humeral Stem	15mm	133mm
5569-P-2016	HA Coated Press-fit Humeral Stem	16mm	140mm
5569-P-2017	HA Coated Press-fit Humeral Stem	17mm	140mm
5569-C-2006	Smooth/Uncoated Humeral Stem	6mm	113mm
5569-C-2006L	Smooth/Uncoated Humeral Stem, Long	6mm	152mm
5569-C-2007	Smooth/Uncoated Humeral Stem	7mm	113mm
5569-C-2008	Smooth/Uncoated Humeral Stem	8mm	118mm
5569-C-2008L	Smooth/Uncoated Humeral Stem, Long	8mm	200mm
5569-C-2009	Smooth/Uncoated Humeral Stem	9mm	118mm
5569-C-2010	Smooth/Uncoated Humeral Stem	10mm	123mm
5569-C-2010L	Smooth/Uncoated Humeral Stem, Long	10mm	200mm
5569-C-2011	Smooth/Uncoated Humeral Stem	11mm	123mm
5569-C-2012	Smooth/Uncoated Humeral Stem	12mm	128mm
5569-C-2012L	Smooth/Uncoated Humeral Stem, Long	12mm	200mm
5569-C-2013	Smooth/Uncoated Humeral Stem	13mm	128mm
5569-C-2014	Smooth/Uncoated Humeral Stem	14mm	133mm
5569-C-2015	Smooth/Uncoated Humeral Stem	15mm	133mm

Catalog #	Description	Size
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ReUnion TSA Self-Pressurizing (SP) Glenoid & Single Radius (SR) Humeral Head Implants

5542-P-00X	X3 Pegged SP Glenoid(s)	X = 40, 44, 48,52, and 56
5542-K-00X	X3 Keeled SP Glenoid(s)	X = 40, 44, 48,52, and 56
5552-E-40X	Size 40, Eccentric SR Humeral Head(s)	X = 14, 17, and 20
5552-E-44X	Size 44, Eccentric SR Humeral Head(s)	X = 16, 19, and 22
5552-E-48X	Size 48, Eccentric SR Humeral Head(s)	X = 15, 18, 21, and 24
5552-E-52X	Size 52, Eccentric SR Humeral Head(s)	X = 17, 20, 23, and 26
5552-E-56X	Size 56, Eccentric SR Humeral Head(s)	X = 19, 22, 25, and 28
5552-S-40X	Size 40, Standard SR Humeral Head(s)	X = 14, 17, and 20
5552-S-44X	Size 44, Standard SR Humeral Head(s)	X = 16, 19, and 22
5552-S-48X	Size 48, Standard SR Humeral Head(s)	X = 15, 18, 21, and 24
5552-S-52X	Size 52, Standard SR Humeral Head(s)	X = 17, 20, 23, and 26
5552-S-56X	Size 56, Standard SR Humeral Head(s)	X = 19, 22, 25, and 28

ReUnion TSA

Glenoid Surgical Protocol

Notes



Reconstructive

Hips
Knees
Trauma & Extremities
Foot & Ankle
Joint Preservation
Orthobiologics & Biosurgery

MedSurg

Power Tools & Surgical Accessories
Computer Assisted Surgery
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325 Corporate Drive
Mahwah, NJ 07430
t: 201 831 5000

www.stryker.com

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