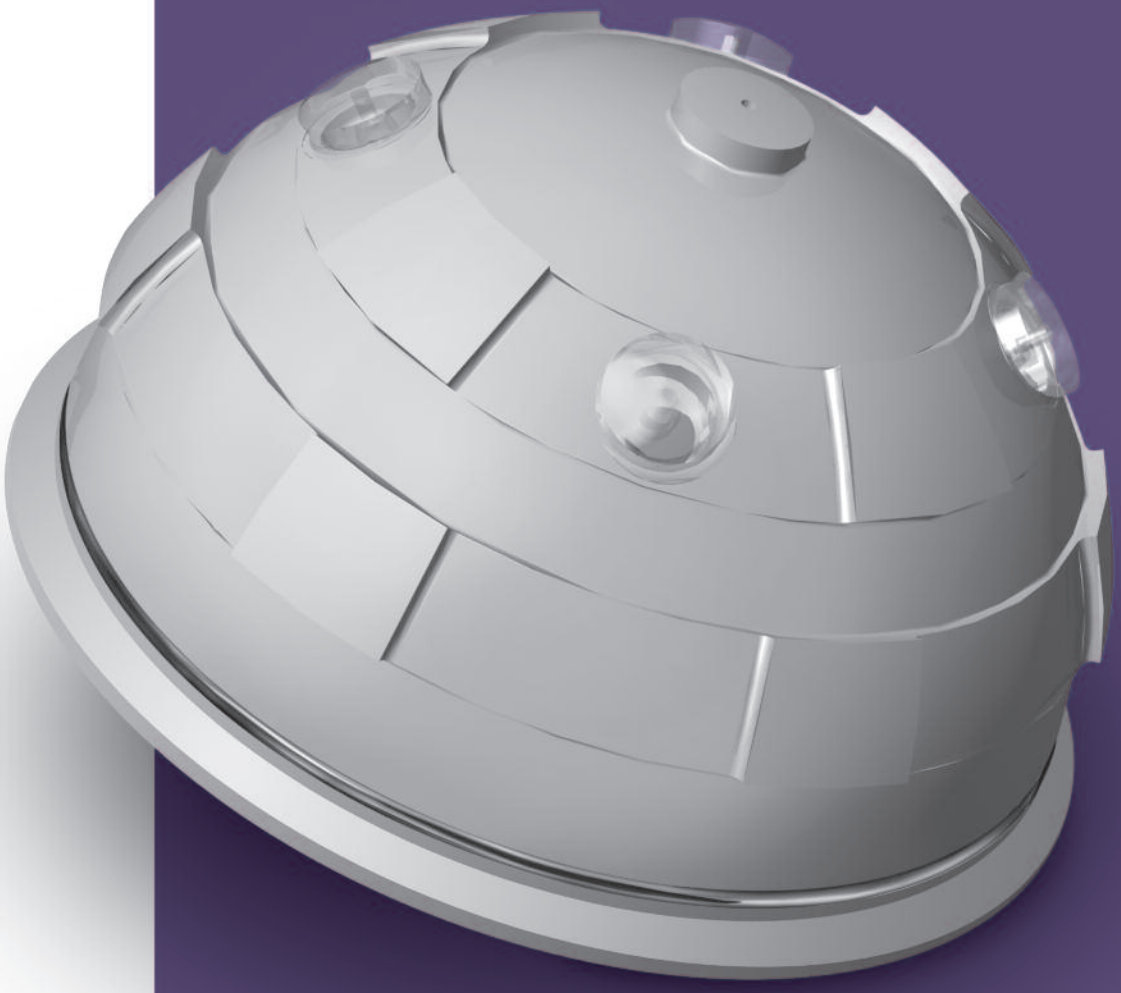
stryker

Orthopaedics

Trident®

All Poly Acetabular System

Surgical Technique



Trident All Poly Acetabular System

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Indications

The indications for use for total hip arthroplasty include:

- Painful, disabling joint disease of the hip resulting from: degenerative arthritis, rheumatoid arthritis, post traumatic arthritis or late stage avascular necrosis.
- Revision of previous unsuccessful femoral head replacement, cup arthroplasty or other procedure.
- Clinical management problems where arthrodesis or alternative reconstructive techniques are less likely to achieve satisfactory results.
- Where bone stock is of poor quality or inadequate for other reconstructive techniques, such as cementless fixation, as indicated by deficiencies of the acetabulum.

Contraindications

- Any active or suspected latent infection in or about the hip 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 cement mantle around the prosthesis.
- Skeletal immaturity.
- Obesity. An overweight or obese patient can produce loads on the prosthesis which can lead to failure of the fixation of the device or to failure of the device itself.

Warnings and Precautions

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

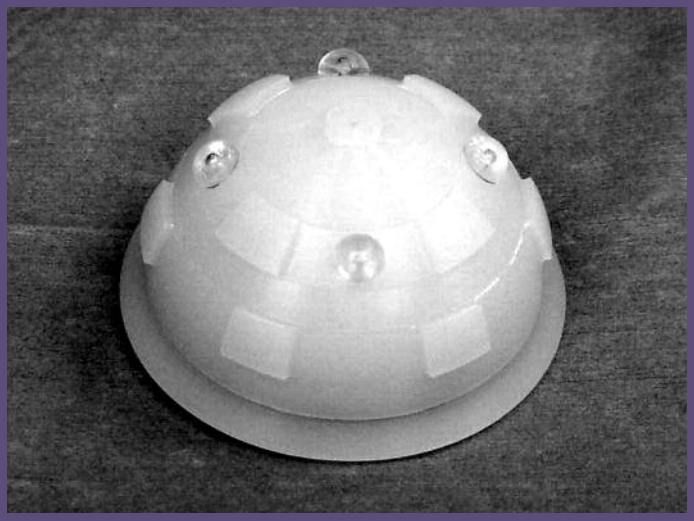
Before using instrumentation associated with the Trident Acetabular System, verify:

- Instruments have been properly disassembled prior to cleaning and sterilization;
- Instruments have been properly assembled post-sterilization;
- Instruments have maintained design integrity; and,
- Proper size configurations are available.

For Instructions for Cleaning, Sterilization, Inspection and Maintenance of Orthopaedic Medical Devices, refer to LSTPI_B.

Introduction

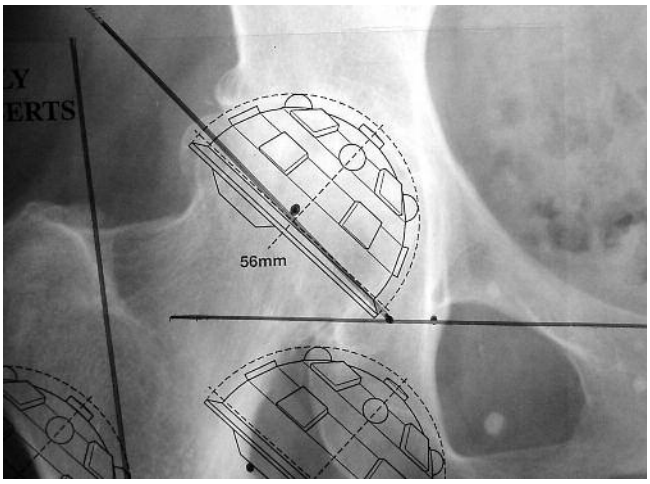
The Trident Acetabular System utilizes the CuttingEdge Total Hip Acetabular Instrumentation as well as one additional tray of specific Trident All-Poly Instruments. This surgical technique is a guide to preparing the acetabulum for the Trident All-Poly Acetabular System Implants utilizing the above acetabular instruments.



STEP 1

PRE-OPERATIVE PLANNING AND X-RAY EVALUATION

Pre-operative planning and X-ray evaluation aids in the selection of the appropriate implant style and size for the patient's anatomy and hip pathology. Selecting potential implant styles and sizes can facilitate operating room preparation and assure availability of an appropriate size selection. X-ray evaluation may also help detect anatomic anomalies that could prevent the intra-operative achievement of the established pre-operative goals.



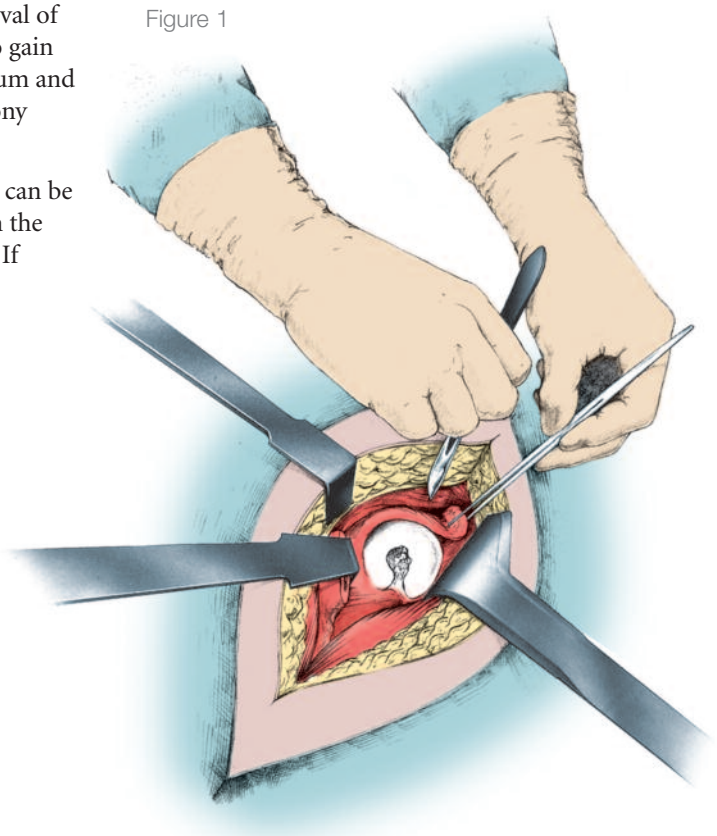
STEP 2

ACETABULAR EXPOSURE

The acetabulum is prepared by the release and removal of soft tissue using the surgeon's preferred technique to gain adequate exposure for reaming. Excision of the labrum and osteophytes allows for proper visualization of the bony anatomy and improves ease of reaming.

Stryker Orthopaedics' Femoral and Wing Retractors can be utilized to gain acetabular exposure (**Figure 1**). With the acetabulum exposed, bony defects can be identified. If necessary, bone grafting options may be considered.

Figure 1



STEP 3

SPHERICAL REAMING

To obtain optimal component positioning in the reaming process, a 45°/20° Abduction/Anteversion Alignment Guide can be attached to the CuttingEdge Reamer Handle (**Figure 2**).

The alignment guide, when perpendicular to the long axis of the patient, will orient the reamer handle at 45° of abduction, thereby placing the axis of the spherical reamer at 45° of inclination (**Figure 3**). The reamer handle may be positioned at 20° of anteversion by aligning the left/right anteversion rod on the alignment guide so that it is parallel to the long axis of the patient.

It is recommended that the initial reaming begin with a CuttingEdge Spherical Reamer that is 4mm smaller than the templated or gauged size. The reamer is attached to the reamer handle by pushing down on the reamer and applying a quarter-turn to lock in place. Reaming progresses in 1mm increments until final sizing is achieved. Surgical judgment is used to assess bone stock, amount of interference, adequacy of medialization and proper amount of reaming as desired.

CAUTION

Only the CuttingEdge Spherical Reamers should be used to prepare the acetabulum for the Trident All Poly Shell.

CAUTION

All external alignment guides depend on knowing that the patient is in a lateral decubitus position and that there is no pelvic tilt.

NOTE

Changes in pelvic tilt and pelvic flexion caused by patient positioning on the table, as well as disease in contralateral hip, spine and pelvis may impact a surgeon's ability to achieve component placement of 45°/20° abduction/anteversion.

TIP **William A. Leone, Jr., MD**

To assess pelvic motion and help achieve the recommended 45° abduction and 20° anteversion, an optional Pelvic Alignment Level (PAL) may be used. For recommended technique, refer to PAL Pelvic Alignment Level Surgical Protocol, LSP61.

Figure 2

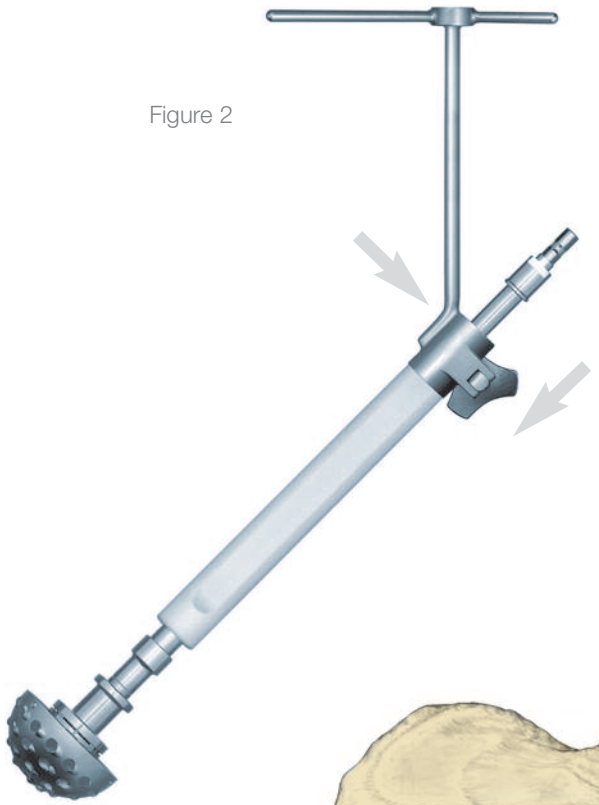
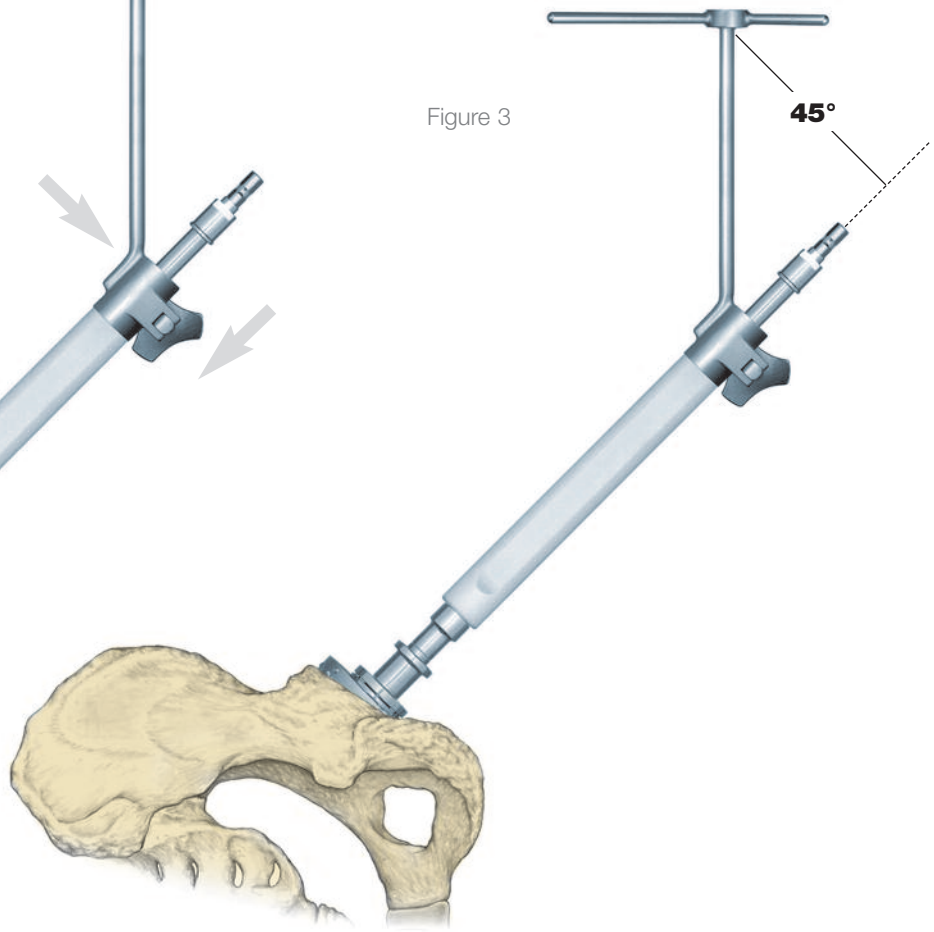


Figure 3



STEP 3

SPHERICAL REAMING *CONTINUED*

NOTE

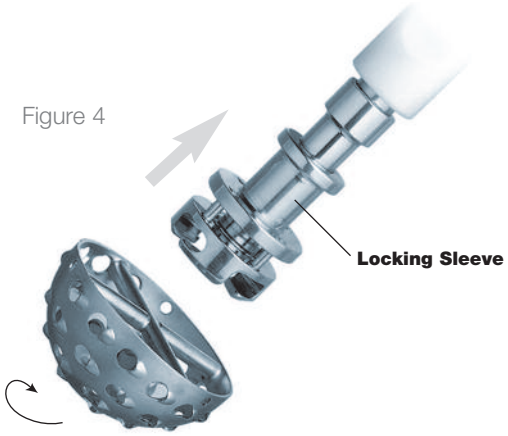
The CuttingEdge Spherical Reamers are very aggressive and perform best when sharp. Care should be taken to protect the reamer from unnecessary handling, as dull or damaged cutting teeth may cause improper reaming. Dull cutting teeth will deflect to cut softer bone and resist hard bone. This situation may result in an irregularly shaped or enlarged acetabulum preparation.

The full profile of the CuttingEdge Spherical Reamer necessitates reaming to the full depth. The reamer head should be driven to the point where the rim/cross bar contacts the acetabular wall at the peripheral lunate region. Removal of the reamer from the handle is performed by pulling back on the locking sleeve and rotating the reamer head a quarter turn in a clockwise direction (**Figure 4**).

Care should be taken so as not to enlarge or distort the acetabulum by eccentric reaming. Final acetabular reaming ideally shows the hemispherical acetabulum denuded of cartilage, with the subchondral plate preferably intact, and the acetabular walls preserved.

Reaming should be done to the desired cup size. The Trident All Poly cups are to nominal size (i.e. if you ream to 52mm you would use a 52mm trial and 52mm implant.)

Figure 4



STEP 4

CEMENT FIXATION HOLES

After completion of reaming, fixation holes should be made in the subchondral plate. These can be made with a flexible drill and drill guide provided in the instrument set, a curette, or a power bur (**Figure 5**). A single primary fixation hole should be created in each of three areas: the acetabular dome, ischial ramus, and pubic ramus. Additional holes can be created at the surgeon's discretion. The window trials corresponding to the last reamer used is inserted into the acetabulum (**Figure 6**). The acetabular window trials are the same size as the actual implant plus the cement and should fit well into the acetabulum. This will allow estimation of the depth that cemented socket should reach while maintaining an adequate cement mantle. Implant cup trials (1030-XXXX) should also be used to assess the fit and estimate final orientation of the cup prior to implantation.

Figure 5

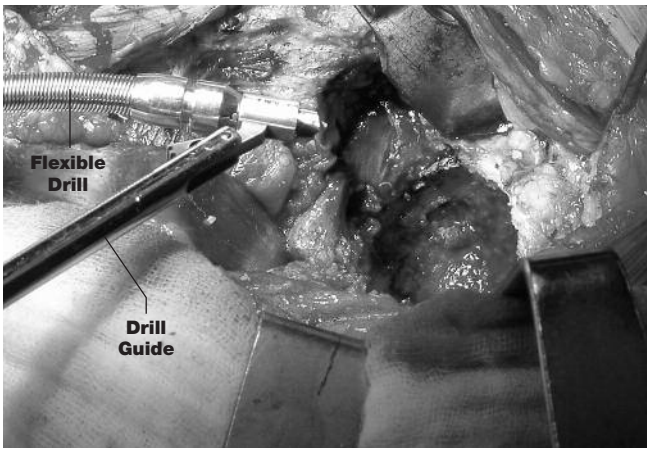
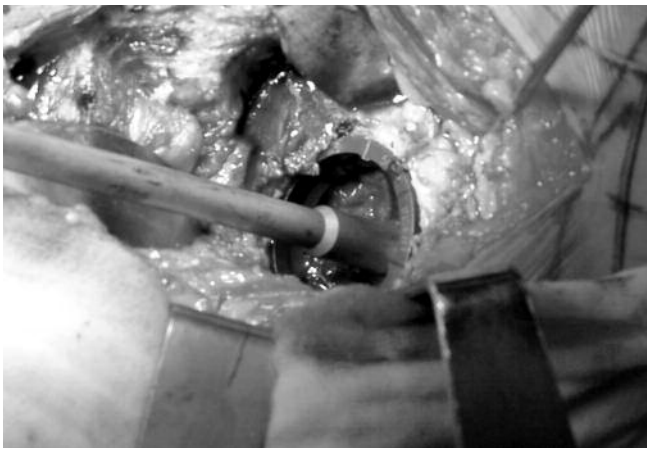


Figure 6

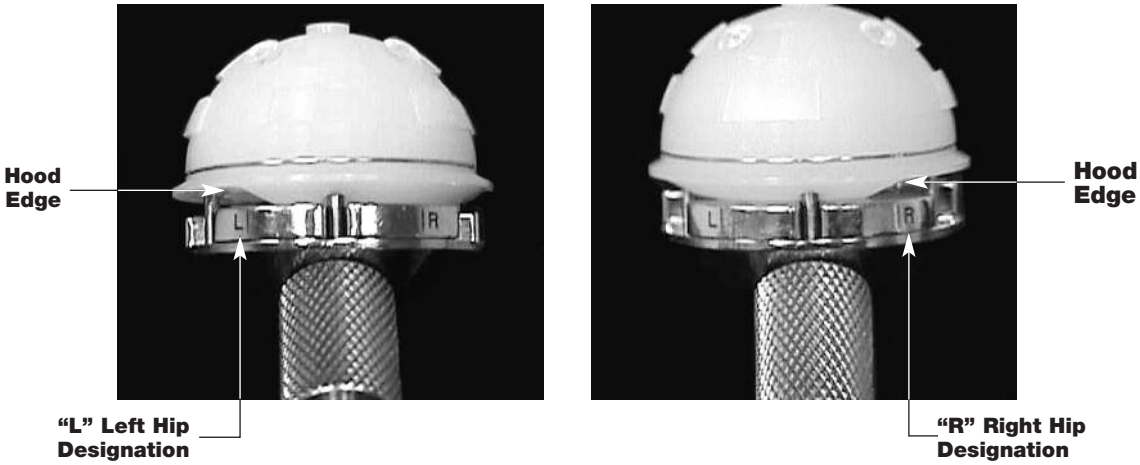


STEP 5

CUP IMPLANTATION

Mount the selected cup on the cup introducer, be sure to place the hood as indicated in (**Figure 7**) for left and right hip designation. Place the anteversion rod in the correct hole of the cup introducer as indicated in (**Figure 8, see below**), for left and right hip designations. The cement is mixed and is inserted into the acetabulum in bolus form. Once it has achieved a doughy state, the cement is pressurized with a large bulb syringe, with the bulb held against the cement bolus.

Figure 7



The surgeon places his thumb over the air hole in the T-Handle of the cement pressurizer handle (1030-1700) for 30-60 seconds (**Figure 9**). He releases the hole and allows the bulb to deflate thereby pressurizing the outer cement area. Care should be exercised to prevent migration of cement under the transverse acetabular ligament. The cup, mounted on the cup introducer, is then pressed gently into the socket and driven deeply into the acetabular bed of cement. The angle guide allows assessment of proper cup position, which is 40° to 45° of abduction or lateral opening and 10° to 20° of anteversion. In cases where there is extreme femoral anteversion, it may then be desirable to have the cup in a more neutral position with regard to anteversion/ retroversion.

Figure 8

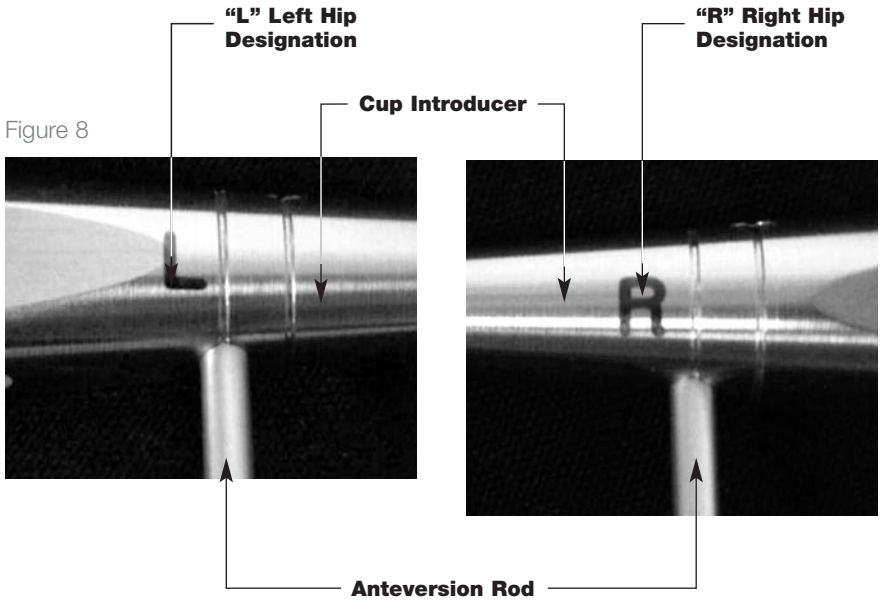


Figure 9

STEP 5

CUP IMPLANTATION *CONTINUED*

TIP **William A. Leone, Jr., MD**

To assess pelvic motion and help achieve the recommended 45° abduction and 20° anteversion, an optional Pelvic Alignment Level (PAL) may be used. For recommended technique, refer to PAL Pelvic Alignment Level Surgical Protocol, LSP61.

TIP **Chitranjan Ranawat, MD**

While the alignment guides are of some assistance, it is important to critically evaluate anatomic landmarks before placement of the acetabular component. These anatomic landmarks include the anterior and posterior walls of the acetabulum, the sciatic notch, the floor and/or acetabular fossa of the acetabulum.

The recommended cup abduction angle of 45° is determined by positioning the long handle of the cup introducer perpendicular to the long axis of the patient (**Figure 10**).

Moving the cup so that the left/right anteversion rod on the cup introducer is parallel to the long axis of the patient (**Figure 11**) sets the cup anteversion at 20°.

The cup is inserted into the acetabulum and aligned as stated above. The cup introducer should not be removed from the cup until the cement is completely cured. It is essential that the cup be compressed into the acetabulum and the introducer held as still as possible until the cement has hardened. To maintain constant pressure, use the All Poly Cup Pusher (1030-1600) applied to the base dimpled area of the cup introducer.

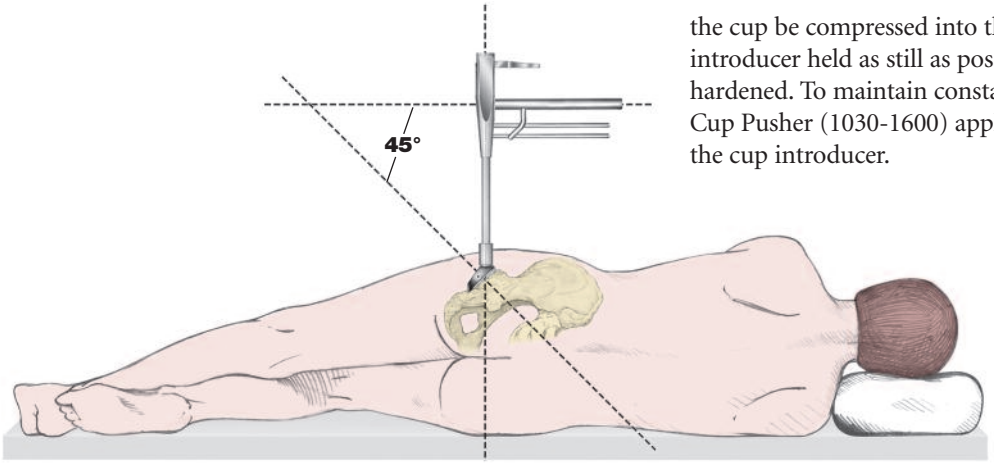


Figure 10 A/P View

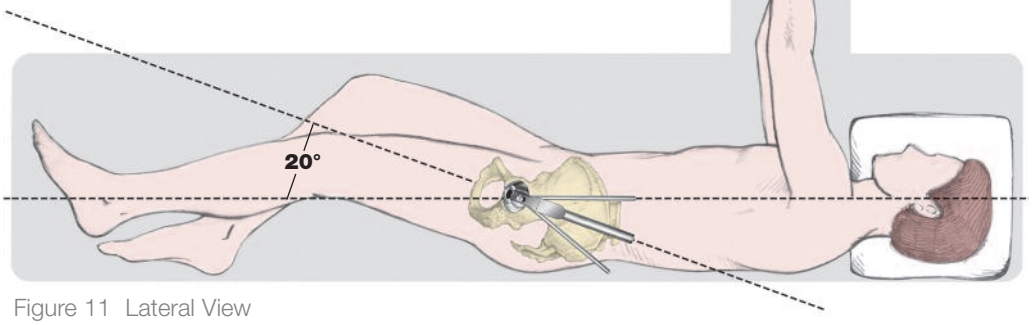


Figure 11 Lateral View

NOTE

The left anteversion rod shown is used for a left hip. Only the applicable rod (left/right) needs to be installed on the introducer which corresponds to the hip procedure being performed (left/right).

After the cement is cured, the cup introducer is then carefully released by depressing the spring loaded trigger. All excess bone cement should be removed from the edges of the cup by utilizing curettes and osteotomes (**Figure 12**).

Figure 12

Trident All Poly Acetabular System Crossfire Implants

Catalog Number	Description	Min. Poly Thickness (mm)	Trials
65C-2240	22 x 40	6.4	1030-2240
65C-2242	22 x 42	7.4	1030-2242
65C-2244	22 x 44	7.9	1030-2244
65C-2642	26 x 42	5.5	1030-2642
65C-2644	26 x 44	6.5	1030-2644
65C-2646	26 x 46	7.5	1030-2646
65C-2648	26 x 48	8.0	1030-2648
65C-2844	28 x 44	5.5	1030-2844
65C-2846	28 x 46	6.5	1030-2846
65C-2848	28 x 48	7.5	1030-2848
65C-2850	28 x 50	8.0	1030-2850
65C-2852	28 x 52	8.5	1030-2852
65C-2854	28 x 54	9.5	1030-2854
65C-2856	28 x 56	10.5	1030-2856
65C-2858	28 x 58	11.5	1030-2858
65C-2860	28 x 60	12.5	1030-2860
65C-2863	28 x 63	14.0	1030-2863
65C-2866	28 x 66	15.5	1030-2866
65C-3248	32 x 48	5.5	1030-3248
65C-3250	32 x 50	6.5	1030-3250
65C-3252	32 x 52	7.5	1030-3252
65C-3254	32 x 54	8.0	1030-3254
65C-3256	32 x 56	8.5	1030-3256
65C-3258	32 x 58	9.5	1030-3258
65C-3260	32 x 60	10.5	1030-3260
65C-3263	32 x 63	12.0	1030-3263
65C-3266	32 x 66	13.5	1030-3266

Trident All-Poly Cup Acetabular Instrumentation

Catalog Number	Description
2102-04xx	CuttingEdge Acetabular Spherical Reamers
2102-0410	Cutting Edge Acetabular Reamer Handle
1030-15xx	Trident All Poly Cup Introducer (22, 26, 28 & 32)
1030-1700	Cement Pressurizer Handle
2101-0200	Window Trial Handle
1030-1600	Trident All Poly Cup Pusher
2208-10xxA	CuttingEdge Spherical Cup Window Trials
1030-xxxx	Trident All Poly Cup Trials (ID, OD)
1030-1201	Trident All Poly Acetabular Drill
1030-1200	Trident All Poly Flexible Drill Shaft
1030-1250	Trident All Poly Drill Guide
1030-4000	Trident All Poly Cup Tray

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KAM186 11/13

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