TOTAL
JOINT
ORTHOPEDICS

PLATFORM® ACETABULAR SYSTEM

SURGICAL TECHNIQUE MANUAL

EFFICIENCY BY DESIGN®

TABLE OF CONTENTS

ACKNOWLEDGEMENTS

The Platform® Acetabular System was developed in conjunction with:

Michael P. Bolognesi, MD *Durham, North Carolina*
Thomas L. Bradbury, Jr., MD *Atlanta, Georgia*
George N. Guild, III, MD *Atlanta, Georgia*
Rhett K. Hallows, MD *Durham, North Carolina*
Keith G. Holley, MD *Meridian, Idaho*
Jason M. Hurst, MD *New Albany, Ohio*
Wesley G. Lackey, MD *Indianapolis, Indiana*
William J. Long, MD, FRCSC *New York City, New York*
Michael J. Morris, MD *New Albany, Ohio*
Orhun K. Muratoglu, PhD *Boston, Massachusetts*
Christopher E. Pelt, MD *Salt Lake City, Utah*
Timmothy R. Randell, MD *Alexandria, Louisiana*
Samuel S. Wellman, MD *Durham, North Carolina*

The Platform® Acetabular System

PLATFORM® ACETABULAR DESIGN

The Platform® Acetabular System comprises the best design features from the most successful acetabular constructs, and offers the potential for exceptional patient outcomes and survivorship.[1]

Designed for optimum congruency, the patent-pending Platform® Acetabular System addresses critical concerns about stability, wear, fixation, and maximum range of motion. The cup is thin-walled (3.5mm) with 0.5mm of press-fit, and features high-porosity Ti-Coat® for biological fixation and bony ingrowth.[2] Posteriorly positioned screw holes offer a 30° sweep to provide flexibility in screw placement.

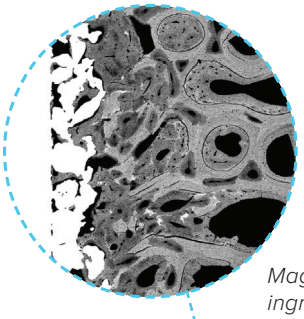
E-Link® Vitamin E Stabilized Acetabular Inserts are highly cross-linked to 10 MRads and accommodate a variety of head sizes to increase range of motion and decrease impingement. One insert for every cup simplifies surgical flow and ensures the center of rotation remains constant.

The Platform® Acetabular System is compatible with both the Klassic HD® and the Klassic® Blade Stems. See Surgical Technique Manuals for surgical preparation and implantation for these and other Klassic HD® Hip System implants (tjoinc.com).

EFFICIENCY BY DESIGN®

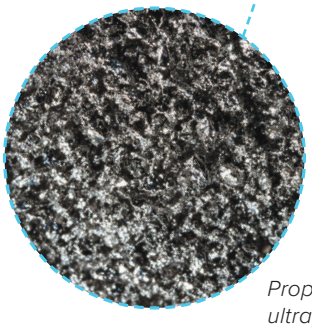
The Platform® Acetabular System is designed to significantly reduce the amount of inventory required to perform a total hip replacement without modifying the preferred surgical technique. The result is a streamlined system that offers surgeons both ease and flexibility of use while reducing costs for the hospital or surgery center. Our goal is to make state-of-the-art, efficient products that provide reliable, reproducible results in any surgical setting.

Designed from the ground up for efficiency, the Klassic HD® Hip System instruments are carefully designed for precise, intuitive surgical flow, and are manufactured from titanium, stainless steel, and high performance plastics for long-lasting performance



Magnification of bony ingrowth on Ti-Coat® [2]

Platform® Acetabular Cup



Proprietary Ti-coat® ultraporous coating

FLEXIBILITY OF USE

The Platform® Acetabular System allows the surgeon to begin with either femoral or acetabular preparation, from a posterior, direct lateral, or anterior approach. For a posterior or direct lateral approach, the surgeon may wish to begin with femoral preparation in order to better gauge combined anteversion. Femur-first preparation allows the surgeon to measure the stem version, which is fixed, and then manipulate the cup to provide the correct matching and combined anteversion. For an anterior approach, the procedure may be easier using a cup-first preparation. We recommend the surgeon use the order with which he/she/they is most comfortable.

FIXATION

The Platform® Acetabular Cup offers Ti-Coat®, an ultraporous, three-dimensional, commercially pure titanium porous coating with a mean porosity of 60% for biological fixation and demonstrated bony ingrowth.[2]

MATERIALS

E-Link® Poly is a Vitamin E stabilized highly cross-linked ultra high molecular weight polyethylene. Vitamin E is blended into the GUR 1020 UHMWPE in powder form, compression molded, and cross linked by Gamma radiation to 10 MRads. E-Link® utilizes Vitamin E to quench free radicals generated from the cross-linking process, yielding oxidative stability.[3]

All of TJO's polyethylene products are ethylene oxide (EtO) sterilized.

The Platform® Acetabular Cup is manufactured from Titanium-6Aluminum-4Vanadium alloy (Ti6Al4V) that offers a lower modulus, is highly biocompatible, and has excellent corrosion resistance when compared to more conventional stainless steels and cobalt-based alloys.[4,5] This titanium alloy has been used in orthopedic implants since the 1960's and has demonstrated a proven history of clinical success.

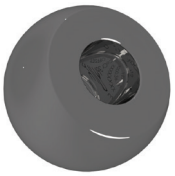
TJO's titanium implants are sterilized using gamma irradiation.

PLATFORM® ACETABULAR SYSTEM
PRODUCT OFFERINGS

Platform®
Acetabular Cup
Sizes: 44-64mm in
2mm increments

Platform® Neutral
Acetabular Insert
Sizes: 28mm head: 44, 46mm
32mm head: 46, 48, 50mm
36mm head: 50-64mm
in 2mm increments
Available in E-Link® Poly only

Platform® Hooded
Acetabular Insert
Sizes: 28mm head: 44, 46mm
32mm head: 46, 48, 50mm
36mm head: 50-64mm
in 2mm increments
Available in E-Link® Poly only



Klassic HD®
Femoral Head
Sizes: 32 & 36mm
-3.5, +0, +3.5, +7mm

BIOLOX®*delta*
Femoral Head
Sizes: 28mm:
-3.5, +0, +3.5;
32, 36mm: -3.5,
+0, +3.5, +7mm

BIOLOX CONTOURA®
Femoral Head
Sizes: 28mm:
-3.5, +0, +3.5mm;
32, 36mm: -3.5, +0,
+3.5, +7mm

BIOLOX®OPTION
Femoral Head
Sizes: 28, 32,
36mm

Klassic HD®
Femoral Stem
Sizes: 1-9 (Standard)
Sizes: 2-9 (Offset)

Klassic® Blade
Femoral Stem
Sizes: 1-12
(Standard and Offset)

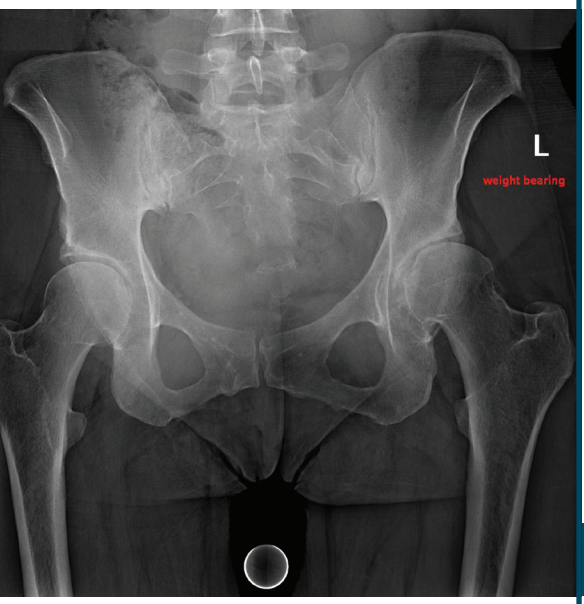
BIOLOX®OPTION
Adapter
Sizes: -3.5, +0,
+3.5, +7, +10.5mm

PREOPERATIVE PLANNING

Preoperative planning is performed using the product templates and a current radiograph of the pelvis, with the inferior edge of the symphysis lying in the center of the picture. The objective of planning is to determine the most favorable position of the implant and its approximate size, and to anticipate possible operative difficulties. A stable acetabular floor capable of bearing loads and a solid lateral bony cover are desirable. The prerequisite for the implantation of a well-fixed primary stable cup is contact by the entire bony circumference of the acetabulum. The primary objectives of preoperative planning are to:

1. Correct preoperative leg length discrepancy
2. Calculate acetabular component size and placement
3. Determine femoral component size, position, and fit
4. Assess the necessary femoral offset

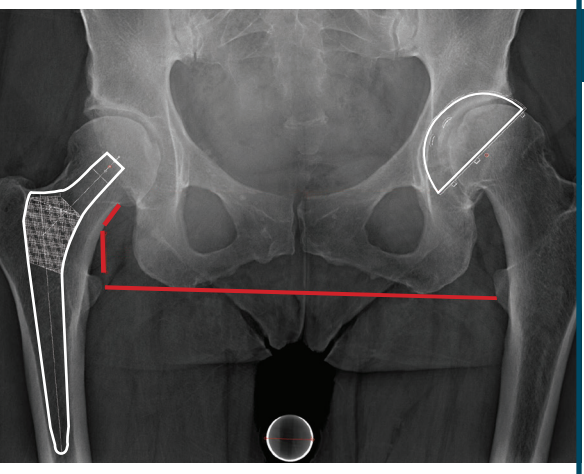
In addition, preoperative planning will assist in the identification of bone abnormalities and potential problems before surgery that may require special instrumentation. The axis of the artificial joint should approximate physiological conditions as closely as possible. The opening plane of the cup should form an angle of 40° to the horizontal line of the pelvis. Most surgeons choose an anteversion of 20° ± 5° intraoperatively, although the correct cup orientation will ultimately depend on the position of the femoral implant.



A/P radiograph of the pelvis

POSITIONING FOR RADIOGRAPHY

For the A/P radiograph of the pelvis, the femurs should be internally rotated 15° to show an accurate view of the femoral neck length, metaphysis, and diaphysis. A direct lateral radiograph may also be beneficial in determining implant sizing. For accuracy, a 25mm magnification marker is recommended. Platform® acetate templates incorporate an 18% magnification.



Templating the femur and the acetabulum

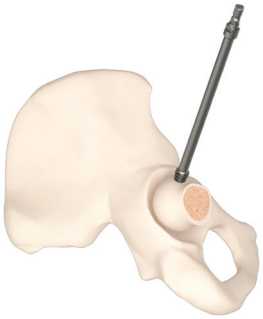
TEMPLATING THE ACETABULUM

Use the involved hip for templating the acetabulum. The actual size of the acetabular component may vary depending on the morphology of the acetabulum and the magnification of the radiograph (e.g., heavier patients may be overmagnified).

Align the hemisphere of the acetabular template with the mouth of the bony acetabulum, avoiding any osteophytes. The component should rest on the cortical floor of the cotyloid notch (the lateral portion of the teardrop). A horizontal line should intersect the distal teardrop and distal extent of the cup at 40° of the lateral opening. Aim for 40° instead of 45° as there is a 5° margin of error in achieving this intraoperatively.[6]

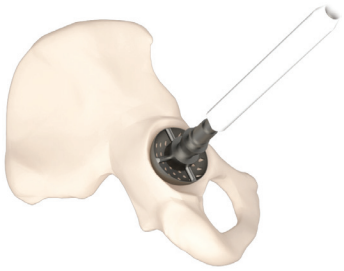
SURGICAL STEPS

1



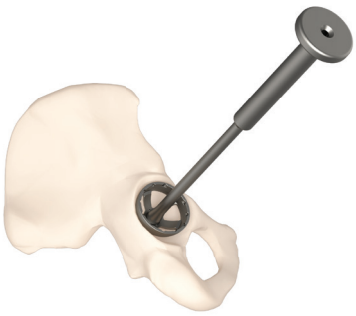
Osteotomize the femoral neck using surgeon's preferred method, and remove the femoral head.

2



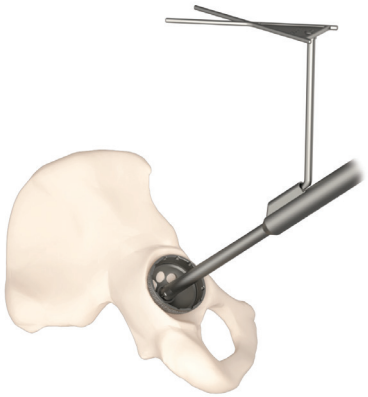
Progressively prepare the acetabulum using the Acetabular Reamers until achieving the desired depth.

3



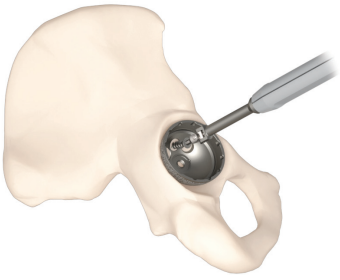
Size the acetabulum with the Cup Sizer and Impactor Handle. The cup size will match the last reamer size used.

4



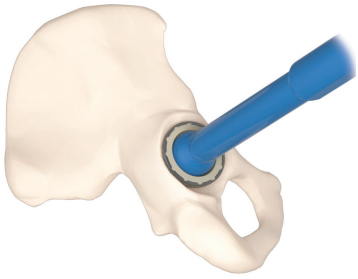
Implant the Platform® Acetabular Cup with the desired version and inclination.

5



[Optional] Use the Bone Awl to prepare the hole for the self-tapping Acetabular Screw. Insert Acetabular Screw(s), ensuring the head is completely sunk so as not to interfere with seating the insert.

6



Implant the Platform® Acetabular Insert using the Acetabular Insert Impactor.

Figure 1: Measuring the femoral neck cut from a posterior approach

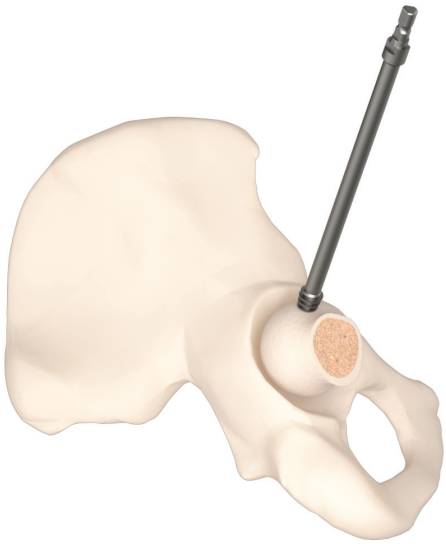


Figure 2: Using the Corkscrew to remove the femoral head

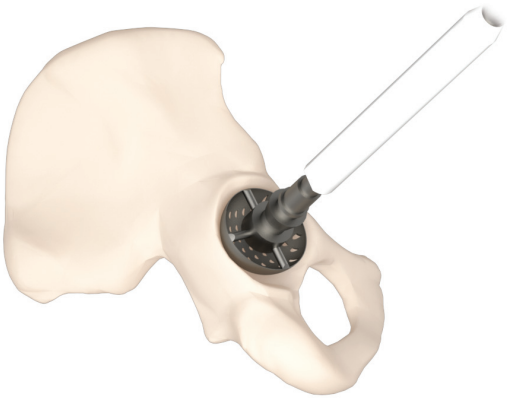


Figure 3: Reaming the acetabulum

1. EXPOSING THE ACETABULUM

After making the skin incision and dissecting the muscle, incise the capsule and the labrum and remove any fibrous, cartilaginous, or bony structures preventing dislocation of the femoral head. If using a posterior or direct lateral approach, dislocate the femoral head from the acetabulum now.

2. REMOVING THE FEMORAL HEAD

Measure the level of the osteotomy as templated using the Femoral Neck Osteotomy Ruler (Fig. 1) and osteotomize the femoral neck, at an angle parallel to the angle of the prosthesis to the neutral axis of the femur (approximately 45º), or parallel to the intertrochanteric line. Remove the femoral head and measure the diameter. This is an internal check of magnification. The final acetabular component should be roughly 5mm larger than the diameter of the femoral head.

For an anterior approach, use a napkin ring osteotomy due to the more difficult exposure. Start by making a proximal cut just below the femoral head. Make a second cut parallel to the first at the planned level of osteotomy and remove the napkin ring. Use the Corkscrew to remove the head (Fig. 2).

Surgical Pearl: For a posterior or direct lateral approach, preparing the femur first is recommended in order to establish femoral anteversion. A combined anteversion of 30-40º is suggested.

3. PREPARING THE ACETABULUM

Attach the Hemispherical Acetabular Reamer to either the Straight or Offset Acetabular Reamer Driver (Fig. 3). The desired objective is to create the geometrical and physiological requirements for the permanently stable implantation of a titanium cup. This is based upon the desired outcomes:

- To achieve anatomically formed implant support
- To preserve bone stock in order to assure a solid support for the implant
- To create certainty of anchoring the acetabular cup in good, vascularized bone

After circumferential exposure of the acetabulum, ream the central acetabular floor with the acetabular reamer that corresponds to the patient's femoral head diameter. Deepen according to the preoperative plan until the floor of the cotyloid notch is reached. When the necessary depth has been reached, move the reamer to an inclination of approximately 40º and ream to bleeding subchondral bone (Fig. 3). Use progressively larger

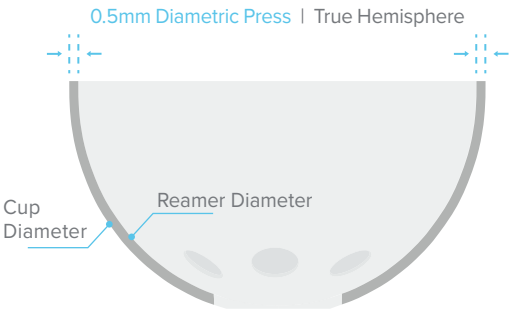


Figure 4: The Platform® Acetabular Cup offers .5mm of pressfit when reaming line-to-line. (See page 12 for more information.)

reamers to increase the diameter to roughly 5mm larger than the native femoral head. Maintain this cranial reamer direction until:

1. The necessary diameter has been attained
2. 50-60% of the acetabular roof has been reamed to bleeding bone
3. The acetabulum is reamed to the pre-planned implant size

Use extreme caution when reaming in order to prevent excessive bone removal and alteration of the morphology of the acetabulum.

Ti-Coat® offers a Velcro-like surface and the Platform® Acetabular Cup features .5mm of diametric pressfit. The preferred method is to ream line-to-line; for example, when using a 52mm cup, ream to 52mm and expect .5mm of pressfit (Fig. 4). The anterior and posterior acetabular roof must remain stable and solid. The reaming process has ended when these conditions have been achieved.

Surgical Pearl: Alternatively, anatomic landmarks may be used for acetabular anteversion. Palpate the sciatic notch and align the acetabular component to the notch. Or, if the transverse acetabular ligament is visible, transect it at a 90° angle. Use both of these checkpoints to determine the best acetabular placement for each individual patient's pelvic anatomy.

4. SIZING THE PREPARED ACETABULUM

Acetabular Cup Sizers test whether a cup of a given diameter is stable in the prepared acetabulum. After attaching the Cup Sizer to the Straight Shaft Cup Inserter or Curved Acetabular Cup Impactor, drive the Cup Sizer into the prepared acetabular floor at the desired abduction and anteversion (Fig. 5). It should have stable seating under pulling, rotating, and careful tilting loads. The contact between the acetabular floor and the Cup Sizer may be tested with any surgical clamp through the large windows of the Cup Sizer. The Cup Sizer is then removed by tipping out.

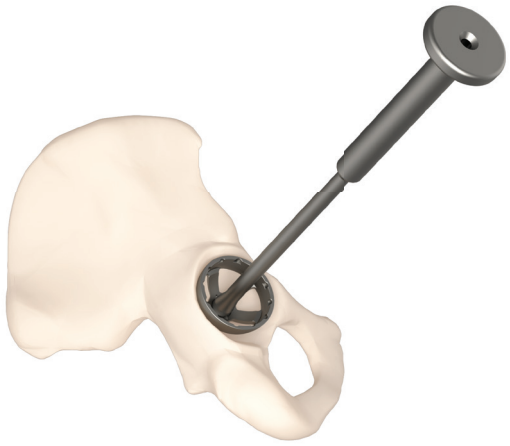


Figure 5: Using the Straight Shaft Cup Inserter to place the Acetabular Cup Sizer

The Cup Sizer also may be used for trialing in reduction. Leave the sizer in place and unthread the impactor. Place the Acetabular Insert Trial in the cup sizer to create the acetabular trial construct.

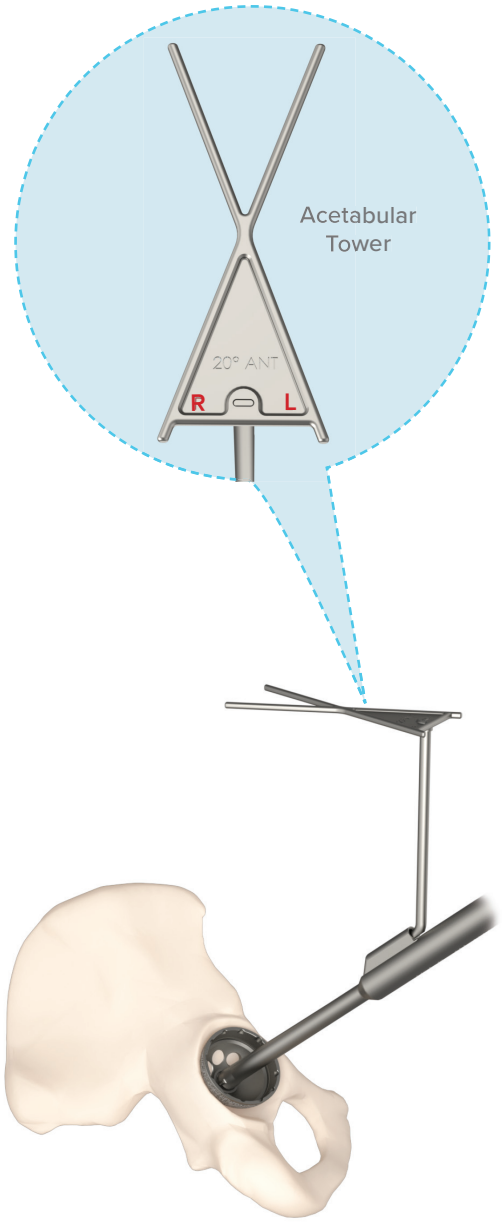


Figure 6: Using the Acetabular Cup Positioner and Acetabular Cup Positioner Tower (posterior approach only) to place the Platform® Acetabular Cup

5. IMPLANTING THE ACETABULAR CUP

Remove the Platform® Acetabular Cup from the sterile packaging and attach it to the assembled Acetabular Cup Positioner with the screw holes in the postero-superior position. For a posterior approach, attach the Acetabular Cup Positioner Tower to the Acetabular Cup Positioner, noting the right or left orientation (Fig. 6). The vertical portion of the Tower, when perpendicular to the table, references 40° of abduction. The correct Right or Left portion of the Tower, in line with the back of the shoulder, references 20° of anteversion.

When using the back of the shoulder as a reference, confirm the patient is positioned parallel with the OR table to ensure landmark accuracy.

Using a mallet, seat the Platform® Acetabular Cup with the abduction and anteversion defined by the Tower. Avoid any exposed anterior portion of the cup to help prevent soft tissue irritation.

The Acetabular Cup Positioner Tower is for use in a posterior approach only, and does not reference the correct landmarks for an anterior approach.

The system alternately offers the Curved Acetabular Cup Impactor. Attach the Platform® Acetabular Cup to the impactor using the Curved Acetabular Cup Impactor Ball Hex Driver. The vertical portion of the tower, when perpendicular to the table, references 40° of abduction. The Anteversion Rod, when fit into the appropriate RIGHT or LEFT hole at the top of the Tower and aligned with the back of the shoulder, references 20° of anteversion when using a posterior approach.

The Anteversion Rod should not be used for an anterior approach.

Using a mallet, seat the Platform® Acetabular Cup. Avoid any exposed anterior portion of the cup to help prevent soft tissue irritation.

Surgical Pearl: The anteversion of the cup should be adjusted according to the anteversion of the stem so that the combined anteversion is 30-40°; which may be lower in men and higher in women.

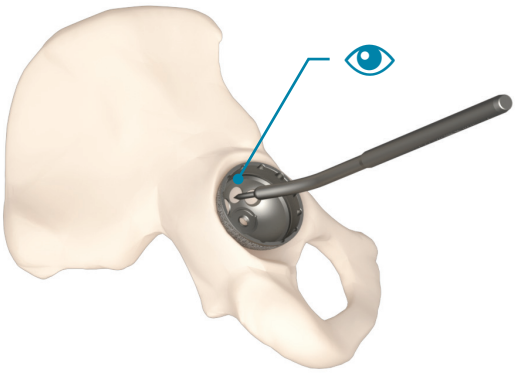


Figure 7: Starting the screw hole with the Bone Awl

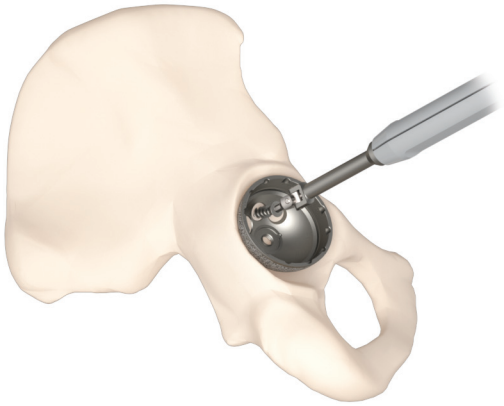


Figure 8: Using a Cancellous Bone Screw for additional fixation

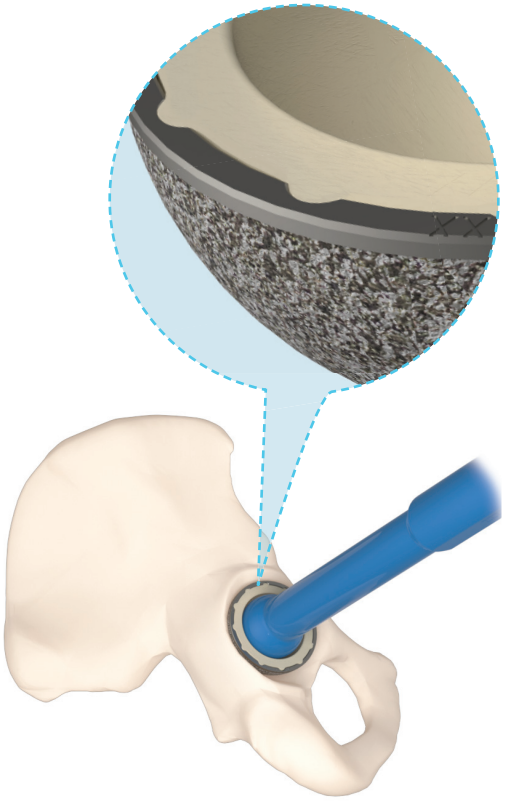


Figure 9: Locking the Insert into the Cup

6. INSERTING THE CANCELLOUS BONE SCREW(S)

The Klassic HD® Cancellous Bone Screws feature a 6.5mm thread diameter and are available in 5mm increments (15-45mm). Platform® Acetabular Cups offer two holes in sizes 44-48mm, and three holes in sizes 50-64mm.

To simplify the initial insertion of the screws, use the Bone Awl to make a starter hole through the subchondral bone (Fig. 7). Use of the awl helps prevent penetration of the inner pelvic cortex to reduce the risk of vessel injury. No pre-drilling is necessary, however, a Drill Guide and Depth Gage are available.

Posteriorly positioned screw holes offer a 30° sweep to provide flexibility in screw placement.

Use the Acetabular U-Joint Screwdriver to insert the screw(s) (Fig. 8). Ensure screws are completely seated.

Bone Screws are intended for one-time use only, and cannot be reused once inserted.

Ensure all screws are completely seated before impacting the insert to allow the locking mechanism on the insert to engage.

7. IMPLANTING THE ACETABULAR INSERT

Interposed tissues in the Platform® Acetabular Cup or at the cup edge must be avoided as they prevent the insert from fully seating. Remove all surrounding osteophytes before placing the insert in the cup, aligning the anti-rotation features on the insert rim with the anti-rotation cutouts on the inside rim of the cup.

Ensure the insert is fully seated and straight, and use the appropriate Acetabular Insert Impactor and a mallet to impact the insert and engage the locking mechanism. The insert is fully seated when it is flush with the cup (Fig. 9).

Note: Use the appropriate Acetabular Insert for the acetabular insert size and head diameter.

Reduce the hip. Close per surgeon preference.

INSTRUCTIONS FOR USE

Please refer to the Total Joint Orthopedics Klassic HD® Hip System Instructions For Use at tjoinc.com/ifu for warnings, precautions, adverse effects, and other essential product information.

REFERENCES

[1] Law, J., Hofmann, A.A., Myers, A., & Grant, A. *Minimum 5-year follow up of porous coated cementless total hip arthroplasty.* J Orthop Muscular Syst Res. 2019;2:09. DOI: 10.29011/JOMSR-09.100009.

[2] Epperson, R.T., Mangiapani, D., Bloebaum, R.D., & Hofmann, A.A. *Bone ingrowth comparison of irregular titanium and cobalt-chromium coatings in a translational cancellous bone model.* J Biomed Mater Res B Appl Biomater. 2019.

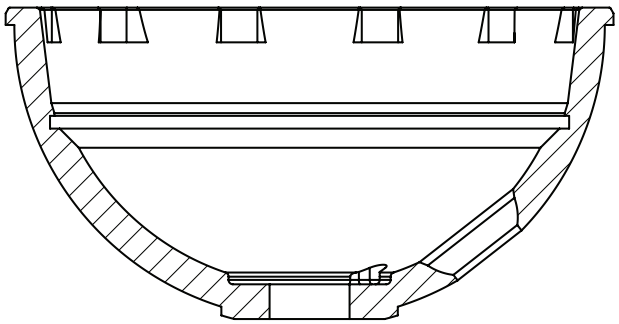
[3] Crowninshield, R.D., Muratoglu, O.K. *How have new sterilization techniques and new forms of polyethylene influenced wear in total joint replacement?* J Am Acad Orthop Surg. 2008;16:S80-S85.

[4] Long, M., Rack, H.J. *Titanium alloys in total joint replacement – a materials science perspective*. Biomaterials 1998;19:1621-1639.

[5] Kienapfel, H., Sprey, C., Wilke, A., & Griss, P. *Implant fixation by bone ingrowth.* J Arthroplasty. 1999;14:3.

[6] Dorr, L.D., Malik, A., Wan, Z., Long, W.T., & Harris, M. *Precision and bias of imageless computer navigation and surgeon estimates for acetabular component position.* Clin Orthop Relat Res. 2007 Dec;465:92-9.

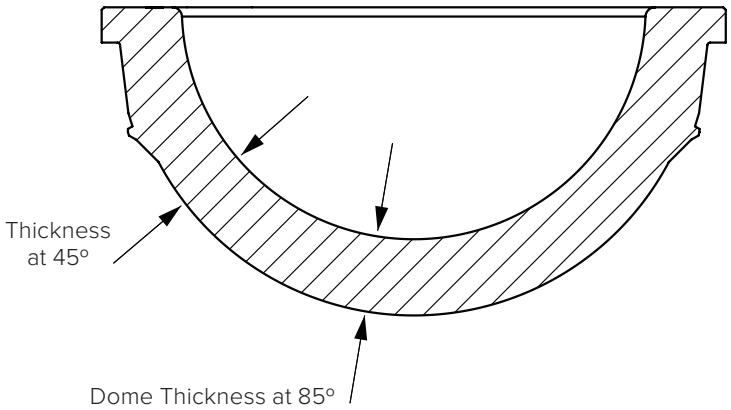
PLATFORM® ACETABULAR CUP



PLATFORM® ACETABULAR CUP DIMENSIONS

Size (mm)	Cup Height (mm)	Cup Diameter at Rim (mm)	Screw Holes
44	23.0	44.5	2
46	24.0	46.5	2
48	24.9	48.5	2
50	26.0	50.5	3
52	26.9	52.5	3
54	27.9	54.5	3
56	28.9	56.5	3
58	29.9	58.5	3
60	30.9	60.5	3
62	31.9	62.5	3
64	32.9	64.5	3

PLATFORM® ACETABULAR INSERTS



PLATFORM® ACETABULAR INSERT | NEUTRAL & HOODED DIMENSIONS

Size (mm)	Head (mm)	Thickness at 45°	Dome Thickness (mm)
44	28	5.5	6.0
46	28	6.5	7.0
46	32	4.5	5.0
48	32	5.5	6.0
50	32	6.5	7.0
50	36	4.5	5.0
52	36	5.5	5.9
54	36	6.5	6.9
56	36	7.4	7.9
58	36	8.4	8.8
60	36	9.4	9.8
62	36	10.3	10.8
64	36	11.3	11.7

Total Joint Orthopedics, Inc.
1567 East Stratford Ave.
Salt Lake City, Utah 84106

888.890.0102 tjoinc.com

LB-91088 Rev. A/092122
Made in the USA

For reference only. Please visit tjoinc.com for the most up-to-date product information.