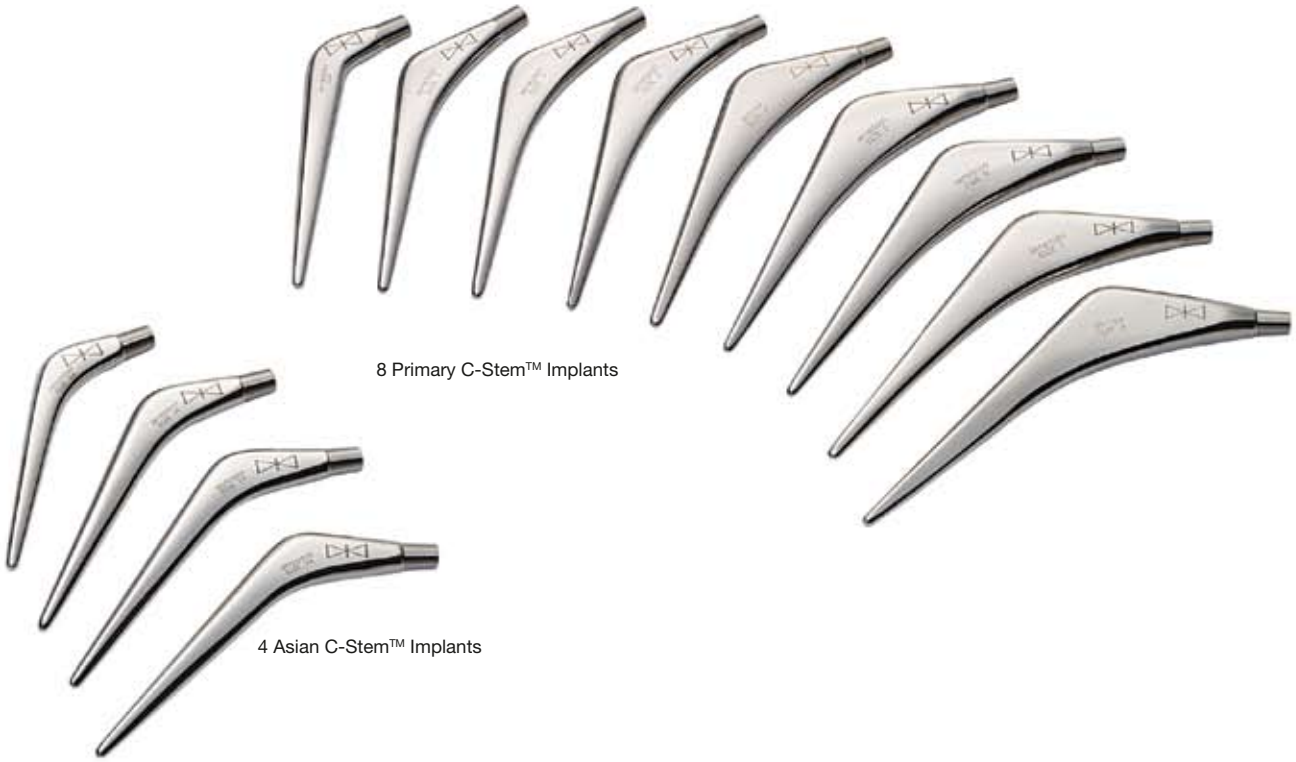
Surgical Technique

C-Stem™ AMT

Triple Tapered Stabilised Hip

DePuy
a Johnson & Johnson company



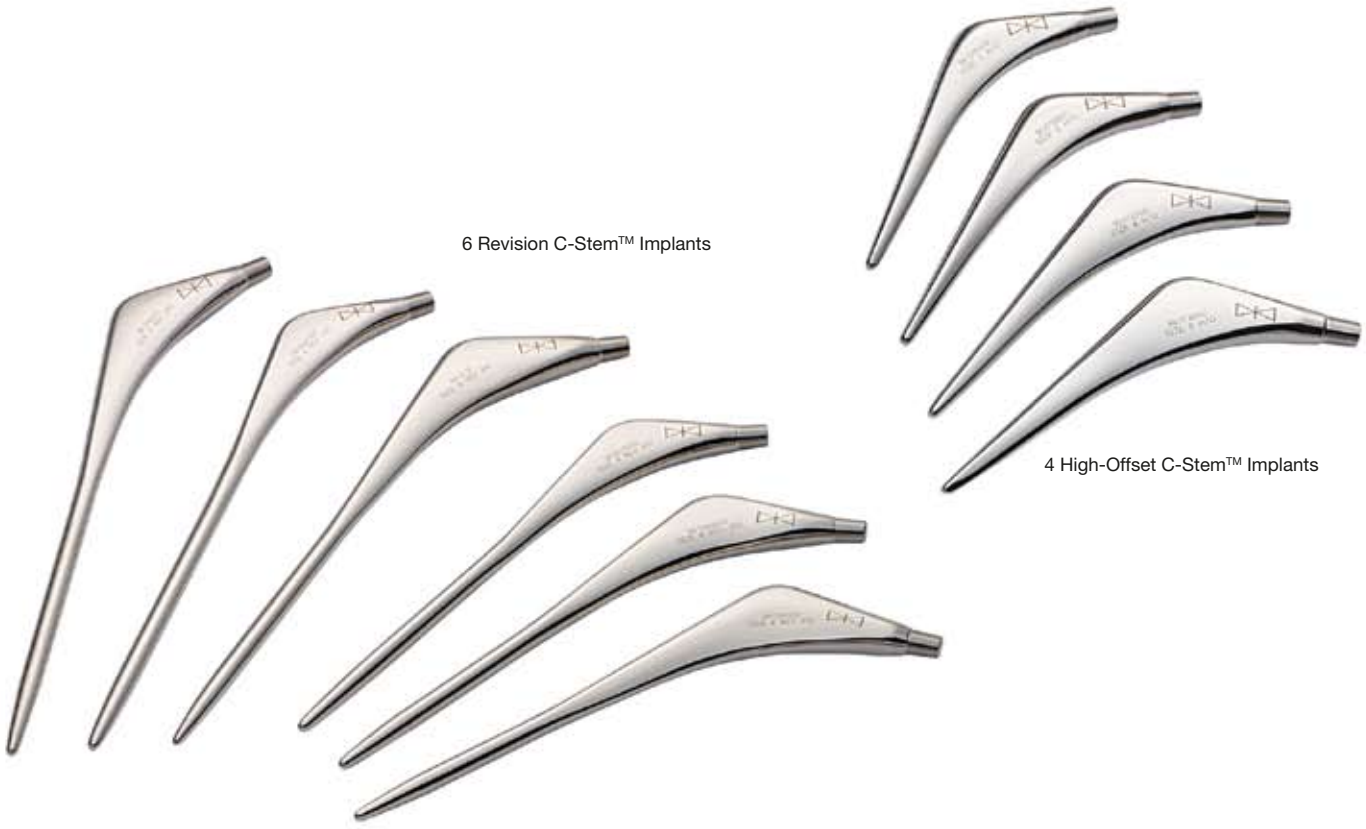
8 Primary C-Stem™ Implants

4 Asian C-Stem™ Implants

Introduction

The C-Stem™ Triple Taper Stabilised Hip represents a significant move forward in our understanding of the mechanisms that affect long-term performance of cemented stems. Results using this multiple tapered design have, for the first time, demonstrated a marked absence of the radiological signs which are generally considered the pre-cursor of implant loosening and failure.[1]

It is apparent however, that implant design alone is not sufficient to assure success. A surgical technique that leads to proper



6 Revision C-Stem™ Implants

4 High-Offset C-Stem™ Implants

8 Primary C-Stem™ AMT Implants

implant placement and alignment and a consistent, reliable cement mantle is also essential. The C-Stem™ Hip System can also be used to perform minimally invasive hip surgery using the DePuy MI System.

The following pages set out the steps which provide the surgeon with an established surgical technique for precise bone preparation, using correctly aligned instruments and appropriate use of fifth generation cementing techniques.

8 High Offset C-Stem™ AMT Implants

The C-Stem™ AMT Stem builds upon the clinical success of the original C-Stem™ Triple Taper Stabilised Hip and its unique triple tapered highly polished design. By preserving the functional internal geometry and enhancing the extra-medullary geometry, the C-Stem™ AMT Stem can more easily restore function to the majority of the patient population. Its highly polished surface finish and triple tapered geometry works optimally with the cement to provide the patient with a stem that has established long-term success. In addition, the 12/14 Articul/eze® taper provides the surgeon with tremendous versatility in optimising the biomechanical reconstruction of the hip.

The C-Stem™ AMT Stem, combined with a sound modern cementing technique and proven bone cement[2], is designed to restore function to today's patient population.

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Pre-operative Templating

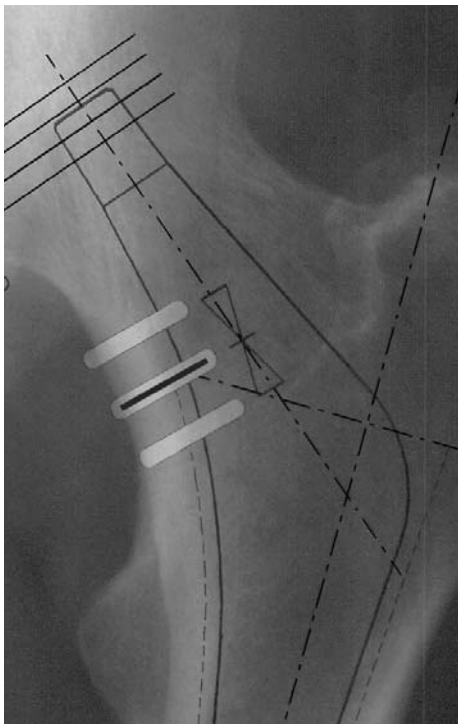


Figure 1 C-Stem™

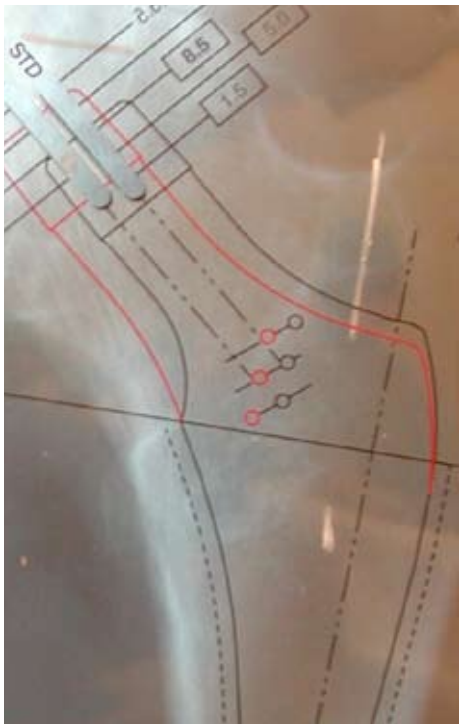


Figure 1a C-Stem™ AMT

Pre-operative Templating

Make a thorough radiographic examination of the contralateral side, taking into consideration any anatomical anomalies, dysplasia or previous osteotomy for example, using both A/P and M/L projections. The radiographs should be at 20% magnification, internally rotated to 15°, and clearly demonstrate the acetabular configuration and the endosteal and periosteal contours of the femoral head, neck and proximal femur.

Templating Femoral Implant Size

The C-Stem™ Implant System offers a complete range of femoral templates. When the approximate size template is selected, overlay the outline above an A/P radiograph of the femur with the implant's centre line in line with the long axis of the femur. Position the template so that either the centre of the "bow tie mark or the central hole" is level with the proposed neck resection and the cement mantle outline fills the proximal femoral canal. With the template positioned accurately, the centre of rotation of the head should overlay the centre of the femoral head (Figure 1/1a).

Confirming the Femoral Neck Resection Level

Mark the X-ray through the central slot or hole in the template. This confirms a "neutral" neck resection level which will maintain existing leg length. Draw a line across the femoral neck at this level. Also draw a parallel line that just touches the superomedial point of the femoral head. Measure the distance between the two lines along the femoral neck axis. Calculate the true length of this line from the known magnification of the X-ray, and set the resection calliper to this length (Figure 2).

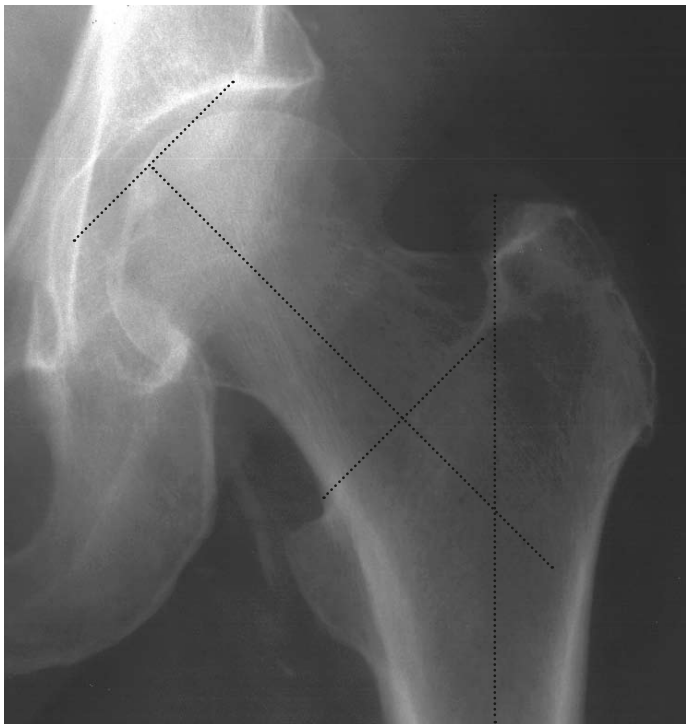


Figure 2

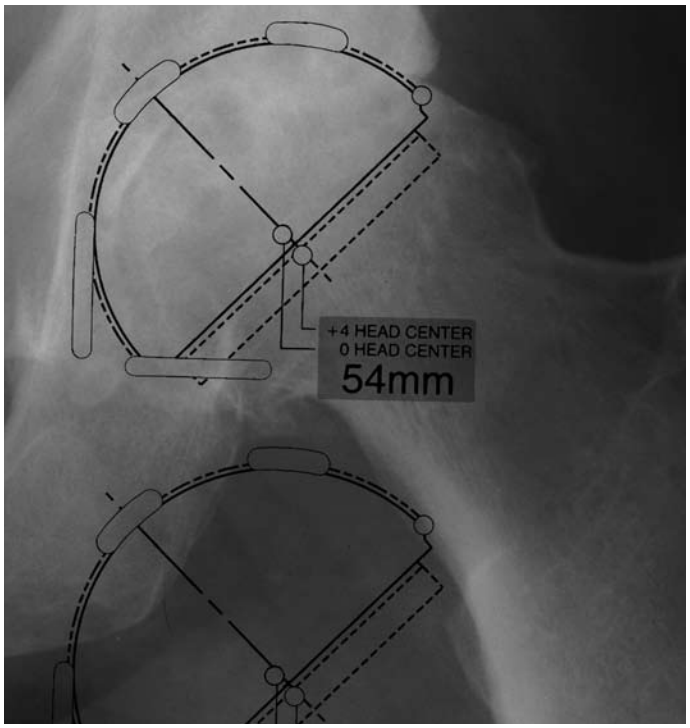


Figure 3

Limb Length Adjustment

Raise or lower the implant outline along the long axis of the femur to increase or decrease leg length, without adjusting the offset. Use the middle slot or hole in the template to mark the neck resection level.

High Femoral Neck Offset Option

If the patient has a higher than normal offset, consider the equivalent size high offset template. With C-Stem™, this will move femoral neck geometry 4 mm medially without increasing leg length, to restore joint stability and reduce the chance of impingement. With C-Stem™ AMT this distance is increased to either 6 mm or 8 mm depending on size. The high offset option can also be used during revision surgery to optimise abductor tension.

Sizing of the Cement Restrictor

Leave 20 mm space from the distal tip of the selected stem template to check for the approximate diameter of the cement restrictor.

Templating for Cemented Acetabular Implant Size

Select an appropriate sized acetabular template and align it with the superior, and then inferior border of the acetabulum. This will ensure that the template is medialised at the level of the teardrop. Once the correct template has been determined, note the centre of rotation and size of the acetabulum on the X-rays.

Templating for Cementless Pinnacle™ Cup Acetabular Implant Size

Using the A/P radiograph, position the Pinnacle™ Cup template at 35 - 45° to the inter-teardrop or interischial line so that the inferomedial aspect of the cup abuts the teardrop. Ensure that the superior-lateral aspect of the cup is not excessively uncovered (Figure 3).

For sizing the void centraliser see page 21.

Surgical Approaches - Anterolateral Approach

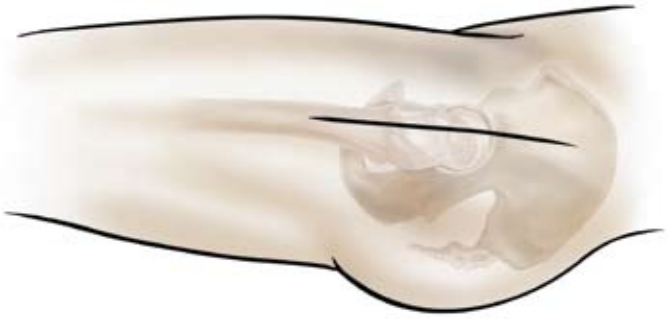


Figure 4
Skin Incision

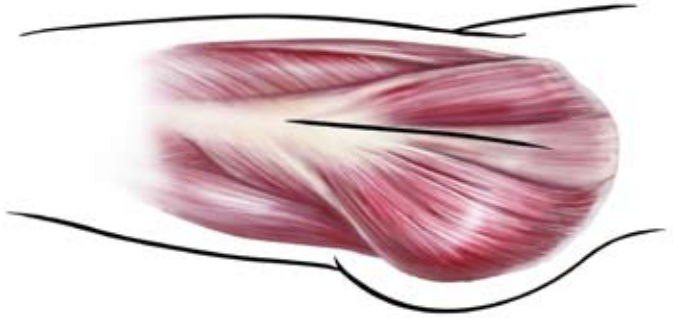


Figure 5
Fascial Incision

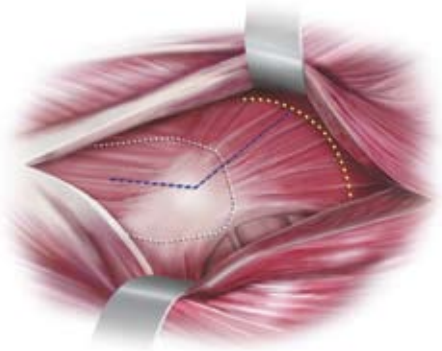


Figure 6
Gluteus Medius Split

Figure 7
Capsulotomy/Capsulectomy

Anterolateral Approach

Use the approach with which you are most familiar and achieve the best surgical result. The C-Stem™ Hip System Instrumentation was designed to accommodate all surgical approaches.

For the anterolateral approach, place the patient in the lateral decubitus position and execute a skin incision that extends from distal to proximal, centred over the anterior aspect of the femur, continuing over the greater trochanter tip (Figure 4).

The iliotibial band is split under the skin incision, extending proximally into the gluteus maximus or in between the maximus and the tensor fascia lata muscles (Figure 5).

Palpate the anterior and posterior borders of the gluteus medius. The gluteus medius is split from the trochanter, parallel to its fibres, releasing the anterior 1/2 to 1/3 of the muscle (Figure 6).

The gluteus medius should not be split more than 4 cm from the tip of the greater trochanter. Care must be taken to ensure the inferior branch of the superior gluteal nerve is not damaged. The gluteus minimus is exposed and released either with or separate from the gluteus medius (Figure 7).

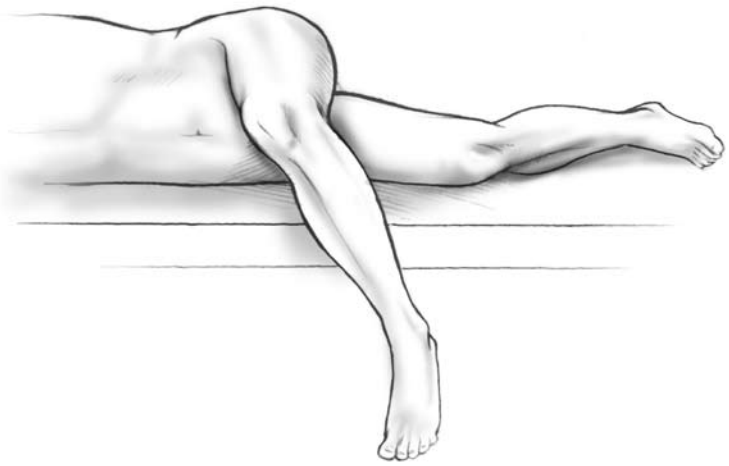


Figure 8
Hip Dislocation

Figure 9
Femoral Neck Exposure

Figure 10
Acetabular Exposure

Flexion and external rotation of the leg facilitates exposure of the hip capsule, which is incised or excised depending on surgeon preference. Dislocate the hip with gentle adduction, external rotation and flexion (Figure 8).

The patient's leg is now across the contralateral leg and the foot is placed in a sterile pouch. If dislocation is difficult, additional inferior capsule may be released.

The femoral neck should now be exposed. Exposure of the acetabulum is accomplished by placing the leg back on the table in slight flexion and external rotation. Use a self-retaining retractor to spread the medius and minimus anteriorly and the hip capsule posteriorly (Figure 9).

Carefully place another retractor over the anterior inferior wall of the acetabulum. The final retractor is placed in the acetabular notch beneath the transverse ligament and pulls the femur posteriorly (Figure 10).

Surgical Approaches - Posterolateral Approach

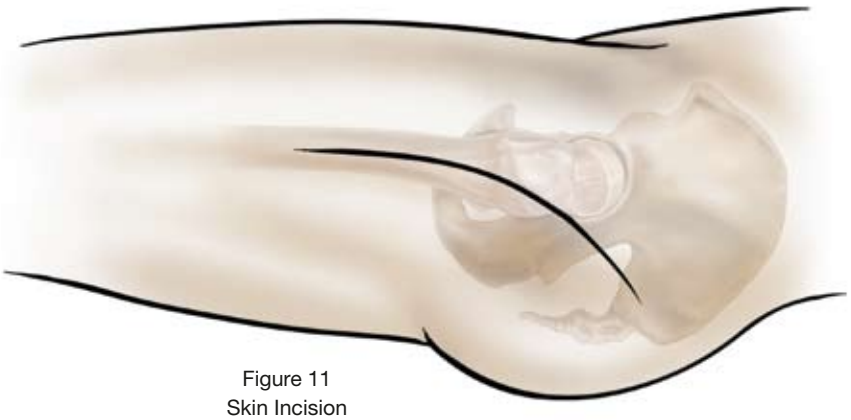


Figure 11
Skin Incision

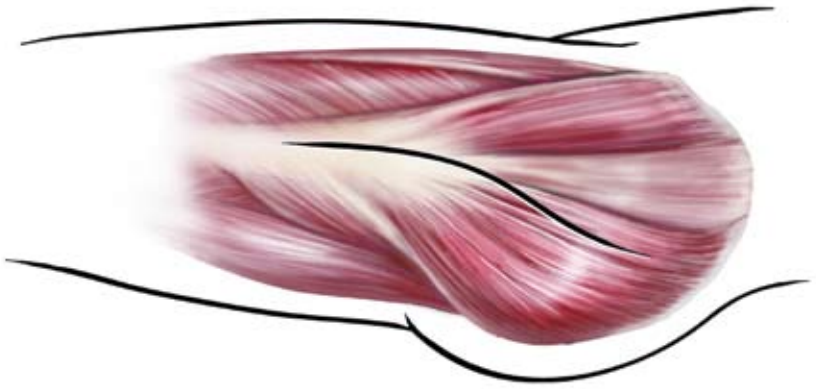


Figure 12
Fascial Incision

Posterolateral Approach

Use the approach with which you are most familiar and achieve the best surgical result. The C-Stem™ Hip System Instrumentation was designed to accommodate all surgical approaches.

For the posterolateral approach, place the patient in the lateral decubitus position. Ensure that the operating table is parallel to the floor and that the patient is adequately secured to the table to improve accuracy of the external alignment guides. Centre the skin incision over the greater trochanter, carrying it distally over the femoral shaft for about 15 cm and proximally in a gently curving posterior arc of about 30° for about the same distance (Figure 11).

Fascial Incision

Incise the iliotibial tract distally following the skin incision. Develop the incision proximally by blunt dissection of the gluteus maximus along the direction of its fibres (Figure 12).

Initial Exposure

Place the leg in extension and internal rotation. Utilise self-retaining retractors to facilitate the exposure. Gently sweep loose tissue posteriorly, exposing the underlying short external rotators and quadratus femoris.

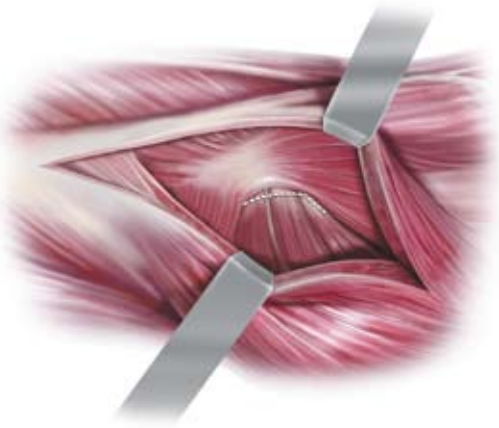


Figure 13
Short External Rotators

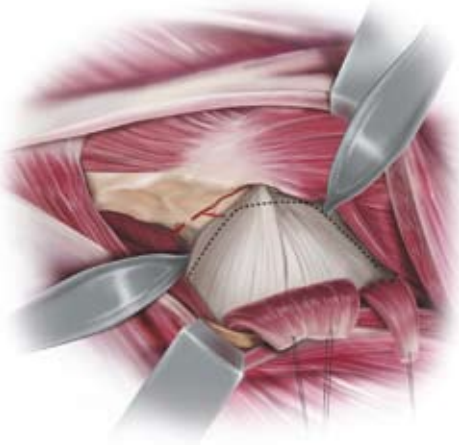


Figure 15
Posterior Capsulotomy

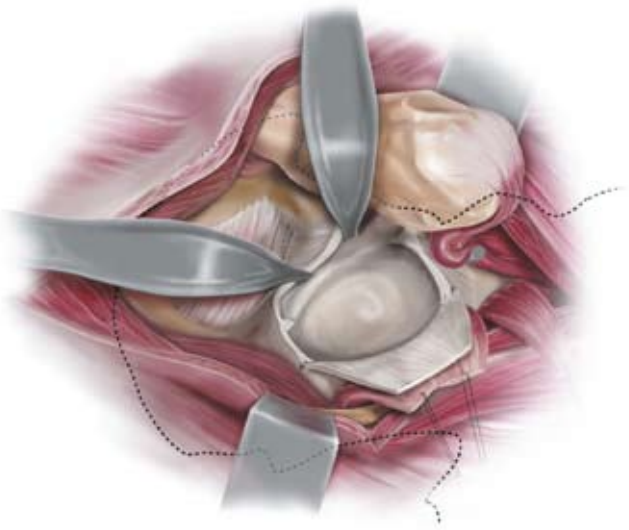


Figure 14
Posterior Capsulotomy

Identify the posterior margin of the gluteus medius muscle proximally and the tendon of the gluteus maximus distally (Figure 13). Use caution to protect the sciatic nerve.

Incise the quadratus femoris, leaving a cuff of tissue for later repair (Figure 14). This exposes the terminal branch of the medial circumflex artery, which lies deep to the proximal third of the quadratus femoris. Identify the piriformis tendon, the obturator internus tendon (conjoint with the gemelli tendons) and the tendon of the obturator externus, and free them from their insertions at the greater trochanter. The piriformis and the conjoint tendon may be tagged for subsequent reapproximation.

Posterior Capsulotomy

Retract the short rotator muscles posteromedially together with the gluteus maximus (with consideration to the proximity of the sciatic nerve), thus exposing the posterior capsule (refer to Figure 14). Place cobra retractors anteriorly and inferiorly (Figure 15).

Open the capsule posteriorly starting at the acetabular margin at about 12 o'clock and heading to the base of the neck, around the base of the neck inferiorly and back to the inferior acetabulum, creating a posteriorly based flap for subsequent repair. Excise additional anterior / superior capsule to enhance dislocation of the hip. Alternatively the capsule can be excised.

Femoral Preparation

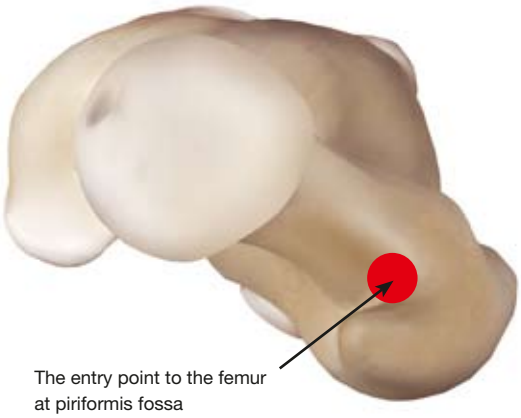


Figure 16

Figure 17

Figure 18

Femoral Canal Initiation

Attach the IM Initiator to the T-Handle. Centralise the initiator at piriformis fossa in line with the long axis of the femur in both the A/P and lateral projections and make an entry point into the proximal femur (Figures 16 & 17). Accurately positioning of the entry point will avoid instrument and implant mal-alignment later.

Femoral Alignment

Attach the Canal Probe to the T-Handle. Introduce the probe into the femoral canal, maintaining neutral orientation. If the entry hole has been positioned correctly, the probe should easily pass down the femur (Figure 18). If the probe impinges, enlarge the entry point using the IM initiator.

The C-Stem™ Hip System is designed as a broach-only system, to maximise the strength of the bone / cement interface. C-Stem™ Hip System reamers are available for surgeons who prefer to ream the intramedullary canal (see page 25).

Femoral Neck Resection
C-Stem™

Figure 19

Neck Resection

Centre the neck resection guide along the neutral axis of the femur and a mark the 45 degree resection line using diathermy (Figure 19). Perform the osteotomy using an oscillating saw, taking care to maintain the correct angle.

If the posterior approach is used, place two retractors around the femoral neck, cut the ligamentum teres and remove the femoral head.

Note: The approach through piriformis fossa leads to neutral A/P and lateral stem positioning with the stem centralised within an even cement mantle.

Femoral Neck Resection
C-Stem™ AMT

Figure 19b

Neck Resection

Once the femoral head is exposed, align the neck resection guide against the long axis of the femur. Determine the resection level by aligning the top of the guide with the tip of the greater trochanter or by referencing a measured resection level above the lesser trochanter, or from the superiomedial aspect of the femoral head along the axis of the femoral neck as determined above (Figure 19b). Confirm the resection level with the preoperatively templated plan. Mark the resection line using diathermy. Resect the femoral head. The collarless stem enables proximal and distal adjustment regardless of neck resection level; however, orientation of the cut should be perpendicular to the neck axis and not horizontal to the long axis of the femur in order to avoid impingement of the medial stem against the medial neck.

Correctly Aligned Stem

Entry point posterior and lateral at piriformis fossa

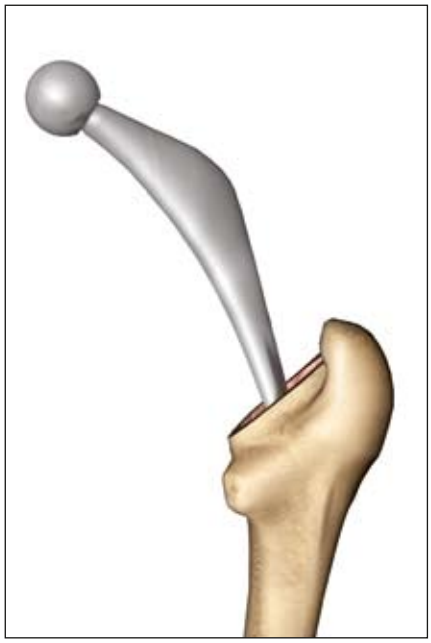
Posterior View
Stem aligned centrally in the canal

Lateral View
Stem aligned centrally in the canal

Medial View
Stem aligned centrally in the canal

Malaligned Stem

Entry point too anterior and medial



Posterior View
Stem in varus

Lateral View
Stem in retroversion and tip against posterior cortex

Medial View
Stem in retroversion and tip against posterior cortex

Acetabular Preparation for Cemented Cup Fixation

Figure 20

Figure 21

Acetabular Preparation for Cemented Cup Fixation

Clear the acetabular rim of soft tissues so that the rim is fully exposed. A retractor can be placed in the teardrop to improve access if required.

The goal of acetabular reaming is to restore the centre of the original acetabulum. Progressively ream the acetabulum with the reamers introduced centrally, in 45° of abduction and 15° of anteversion. Over ream the acetabulum by 6 mm to allow for fixation with cement. It is important to remember that if the posterior approach is employed the pelvis will be in approximately 20° of anteversion and this must be compensated for during both acetabular reaming and cup placement (Figure 20).

Ream the acetabulum to a hemispherical dome of healthy, bleeding subchondral, cortico-cancellous bone that will contain the cup and its surrounding mantle. A balanced approach is needed to create the right bony surface for a good cement interlock, while retaining sufficient subchondral bone to maintain the load bearing strength of the socket.

Clear away any remaining soft tissues and capsule. Remove any osteophytes or cysts from the acetabular bed and repair the defects using a cancellous bone block. Sclerotic bone should also be removed at this stage since this will prevent cement penetration.

Introduce multiple drill holes in the roof of the acetabulum superiorly and posteriorly in the safe quadrant. Use the collared acetabular preparation drill to encourage intrusion of cement into acetabular bone (taking care to avoid the medial wall of the acetabulum - the triangle of bone based on the transverse ligament) (Figure 21). Smooth the edges of the drill holes and remove debris using a small curette. A spoon may be used to feel for cysts that may not have been revealed by reaming or radiological examination.

Cup Sizing

Size the acetabulum using a phantom cup and trial flange attached to the cup introducer. Once the size is established, trim the rim of the trial flange so that it just fits within the rim of the acetabulum. Use the trial as a guide to trim the definitive cup (Figure 22).

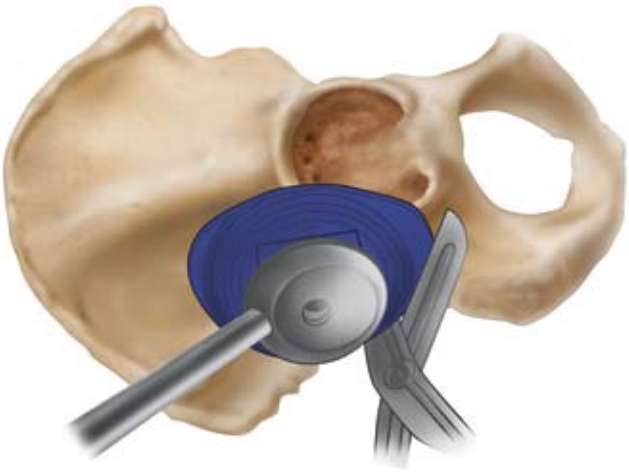


Figure 22

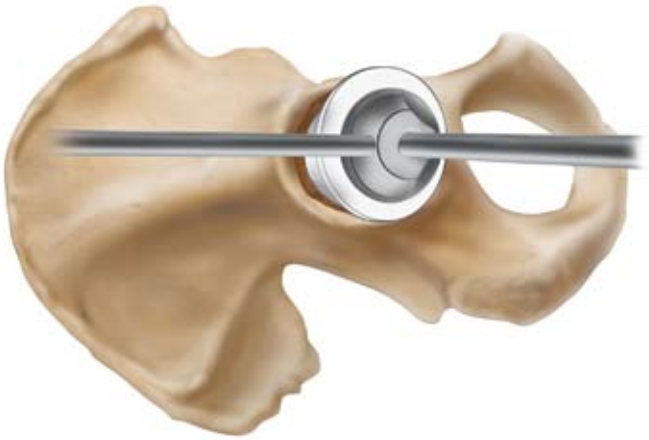


Figure 23

Bone Preparation

Use pulsatile or continuous lavage within the acetabulum to remove fat and debris from the cancellous bone interface. Use a brush to remove loose cancellous bone if necessary. Employ suction and dry swabs to clean and dry the bone surface.

When the acetabular surface is dry and the bone surface is open, pack the socket with hydrogen peroxide impregnated swabs. These will prevent blood clots adhering to the bone and leave the surface ready for cement introduction.

Cement Technique

The majority of surgeons introduce cement into the acetabulum by hand. Use clean gloves to avoid contaminating the cement. Take the bolus of mixed cement and knead to assess the viscosity in addition to visual evaluation. The cement is ready for insertion when it has taken on a dull, doughy appearance and does not adhere to the surgeon's glove. Remove the peroxide swab from the acetabulum and use a dry swab to remove excess peroxide. Introduce the cement in one piece, distribute it to follow the acetabular hemisphere and push cement deep into the fixation holes. This should only take a few seconds.

Cement Pressurisation

Using an appropriately sized acetabular pressuriser, completely seal the acetabulum and apply maximum pressure to encourage interdigitation of bone cement into the cancellous bed. Retain a small piece of cement to finger test to assess the viscosity of the cement. When the cement can be pressed together without sticking to itself, implant the cup.

Cup Implantation

Attach the cup to the cup introducer and align the introducer in 10 to 15° of anteversion (if the posterior approach is employed, the pelvis will be in approximately 20° of anteversion and this must be compensated for). The flange should occlude the acetabulum, with the flange rim sitting just within the border of the acetabulum, so that the cement is contained behind the flange. Place a finger on the flange prior to insertion, to avoid air being trapped behind the flange. The cement should be contained behind the rim of the cup, and the rim fully supported by the cement.

The cup pusher is then located on the back of the cup introducer and the cement is pressurised until polymerisation is complete (Figure 23).

Acetabular Preparation for Pinnacle™ Acetabular Cup

Figure 24

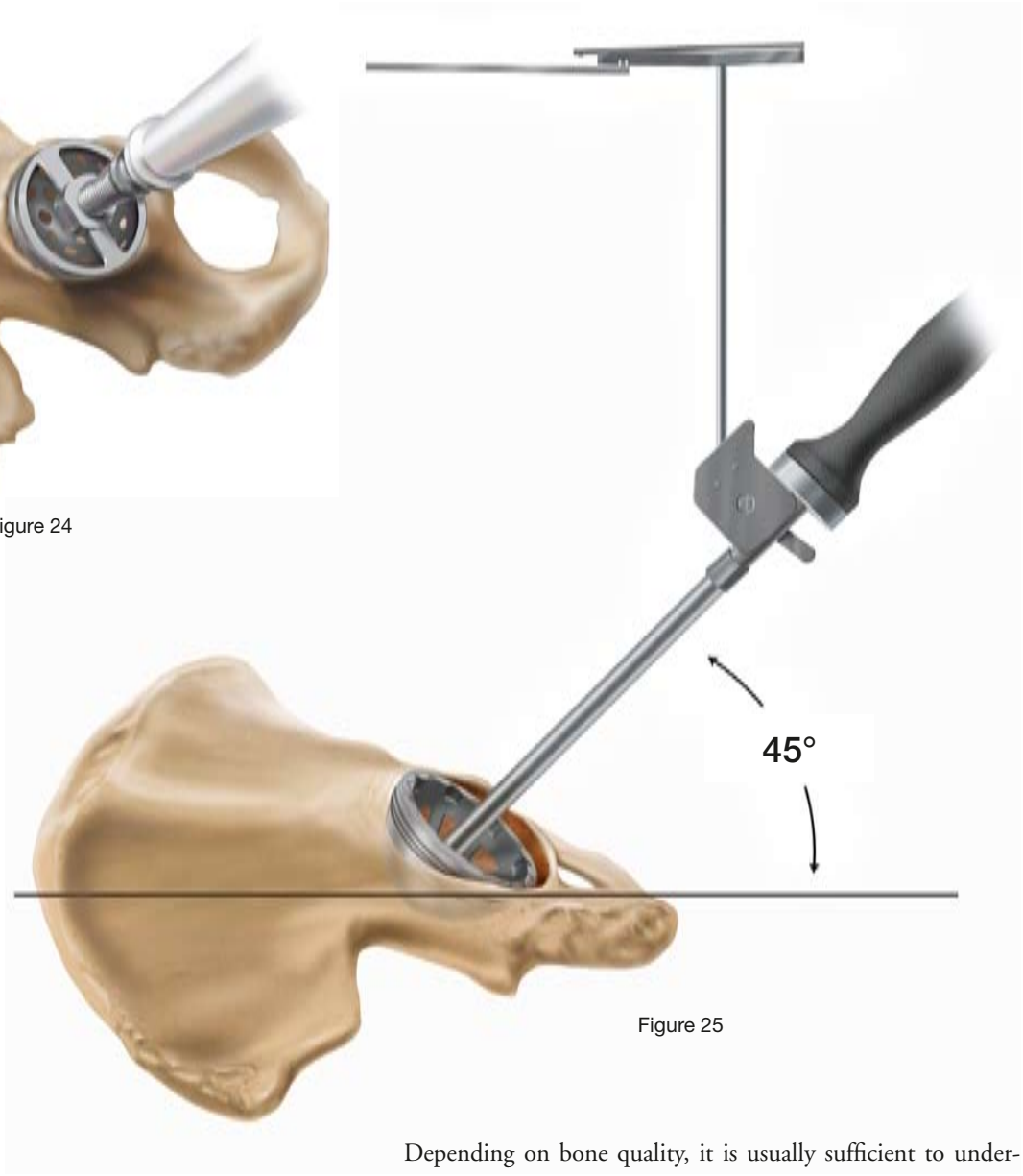


Figure 25

Acetabular Preparation

Acetabular preparation for the Pinnacle™ Acetabular Cup System is essentially the same as the cemented technique, with the following strategy in mind.

Begin with a reamer 6 - 8 mm smaller than the anticipated acetabular component diameter and deepen the acetabulum to the level determined by pre-operative templating.

Increase the reamer sizes in 1 - 2 mm increments (Pinnacle™ instruments are marked with true dimensions), centring the reamers to deepen the acetabulum until it becomes a true hemisphere (Figure 24).

Depending on bone quality, it is usually sufficient to under-ream 1 mm in smaller sockets, while a larger socket may require 1 - 2 mm under-ream. Soft bone will more readily accommodate a greater press-fit of the acetabular component than sclerotic bone. Use a curette to free all cysts of fibrous tissue. Pack any defects densely with cancellous bone.

Acetabular Cup Trialing and Positioning

Pre-operative templating, using the A/P projection will help determine the ideal abduction angle.

The lateral ilium is a useful intra-operative landmark. In a normal acetabulum with good lateral coverage, the abduction angle will be correct if socket lies flush with a normal lateral pillar (Figure 25).

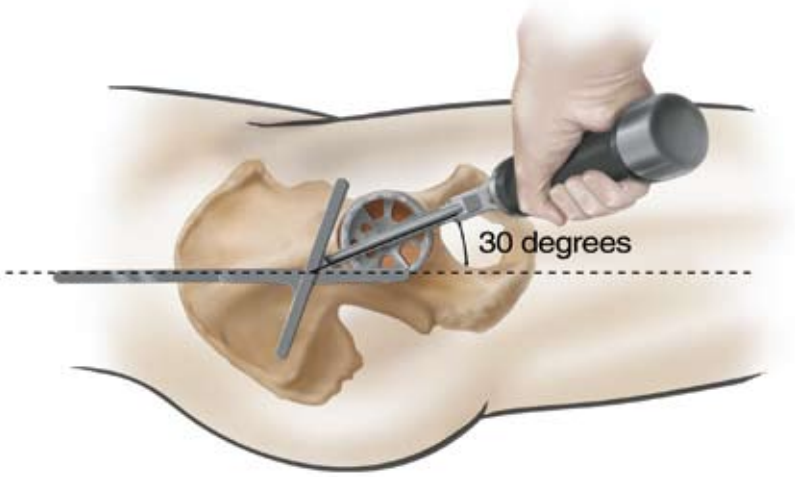


Figure 26

Figure 27

The implanted cup should be slightly more anteverted than the pubis / ischial plane. This relationship should remain constant regardless of the depth of reaming (Figure 26).

Select a cup trial that is equal to or 1 mm larger in diameter than the final reamer. Screw the cup introducer into the threaded apex hole and introduce the cup trial in an anatomic orientation, with an abduction of 35 - 45° to the transverse plane. Confirm that the cup trial is fully seated by sighting through the holes and cut-outs in the acetabular cup trial. Appropriate trial cup orientation can also be verified with external alignment guides.

Definitive Cup Implantation

At this point in the procedure a decision can finally be made whether to use adjunctive screw fixation. This should be carried out with due consideration to bone quality, ensuring the appropriate length of screws are located within the safe quadrant (Figure 27).

Once the correct cup size is confirmed, extract the trial, attach the appropriate definitive cup to the introducer and repeat the orientation process. Once its position and alignment has been checked, impact the cup into place. Insert the apex hole eliminator using a standard hex head screwdriver.

Final Insert Introduction

Prior to inserting the final acetabular insert, thoroughly irrigate and clean the cup. It is important to check that the cup / insert locking groove is free from debris.

A full description of this technique and the range of cup and insert options is available in the Pinnacle™ Cup Surgical Technique Cat No: 9068-080-050.

Metaphyseal Preparation
C-Stem™

Figure 28

Figure 29

Clearing the Anatomical Calcar

In order to achieve an optimal cement mantle, clear the anatomical calcar (the cortical condensation overlying the endosteal entry into the lesser trochanter) using an osteotome or curette. Avoid excavating the lesser trochanter (Figures 28 & 29).

Femoral Broaching

Attach a broach - smaller than the size determined during pre-operative templating - to the broach handle. Carefully impact the broach down the long axis of the canal in neutral orientation. **C-Stem™ System diamond tooth broaches should not be introduced aggressively**. When using the posterolateral approach, incorporate 5 - 15° of anteversion (Figure 30).

Ensure that any remaining superior lateral femoral neck is cleared to avoid varus stem placement. If required, release a small portion of the gluteus medius to facilitate exposure and trim any overhanging trochanter. Progressively increase the size of the broach until the final broach is fully seated in the femur with the broach's marker point in the neutral position, level with the neck resection level, or at the level determined during pre-operative templating (Figure 31). The marker point corresponds to the centre of the bow tie mark on the implant.

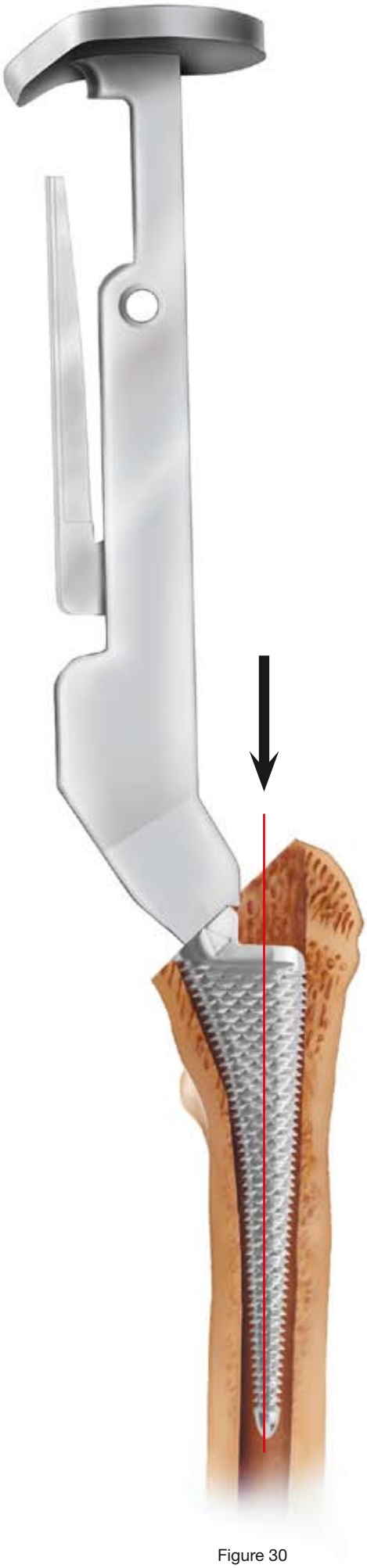
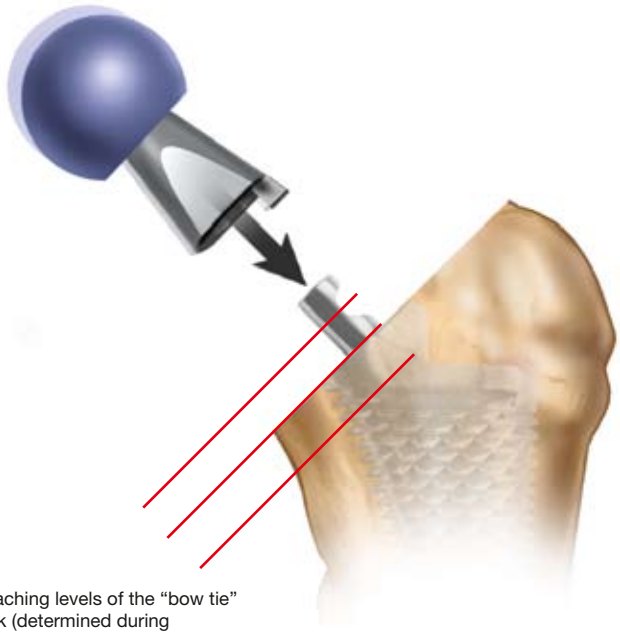


Figure 30



Broaching levels of the “bow tie” mark (determined during pre-operative templating)

Figure 31

The final broach should confirm the size templated pre-operatively and determine the final implant size. The C-Stem™ broach system was designed to incorporate a circumferential 2 mm cement mantle. The 2 mm cement mantle does not include the additional cement mantle created by cement interdigitation into the cancellous bone structure.

Femoral Neck Trial Assembly

Attach the appropriate neck segment to the broach. Multiple trial heads are available to allow for proper restoration of hip biomechanics (28 mm heads: -3 mm, +0 mm, +3 mm and +6 mm neck lengths). The C-Stem™ System offers dual offsets (sizes 2, 3, 4, 5) which allow implant lateralisation by using either a standard or high offset neck segment. If the femoral neck resection level is correct for proper leg length restoration, but there is still inadequate soft tissue abductor muscle tension, consider a high offset neck segment. This will increase the offset and the soft tissue tension without affecting leg length If the high offset neck segment is used, the offset will be increased by 4 mm.

Metaphyseal Preparation
C-Stem™ AMT

Figure 32

Figure 33

Clearing the Anatomical Calcar

In order to achieve an optimal cement mantle, clear the anatomical calcar (the cortical condensation overlying the endosteal entry into the lesser trochanter) using an osteotome or curette. Avoid excavating the lesser trochanter (Figures 32 & 33).

Femoral Broaching

Attach a broach - smaller than the size determined during pre-operative templating - to the broach handle. Carefully impact the broach down the long axis of the canal in neutral orientation. **C-Stem™ System diamond tooth broaches should not be introduced aggressively**. When using the posterolateral approach, incorporate 5 - 15° of anteversion (Figure 34).

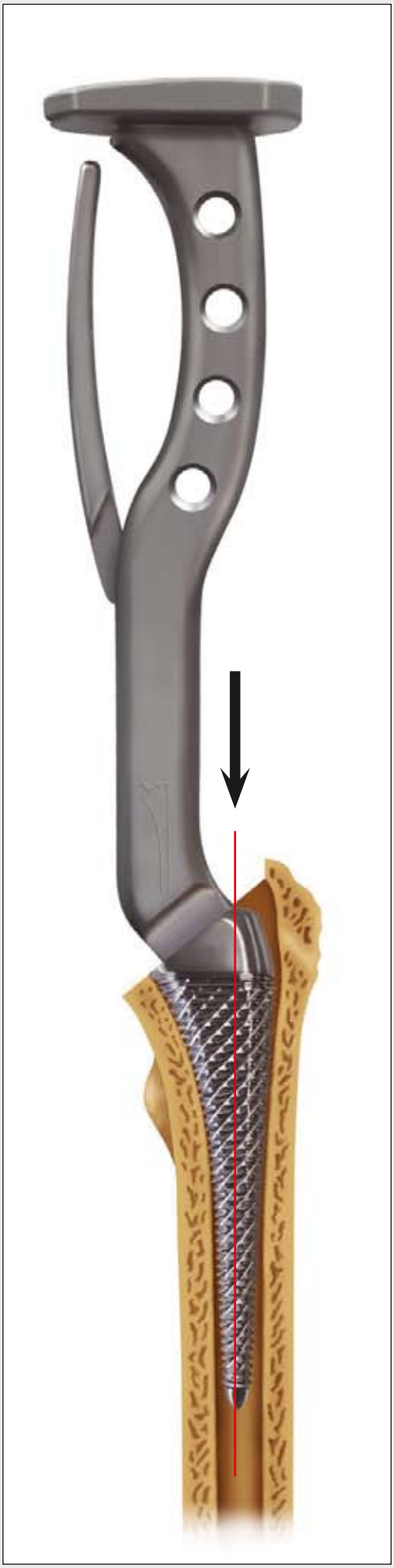


Figure 34

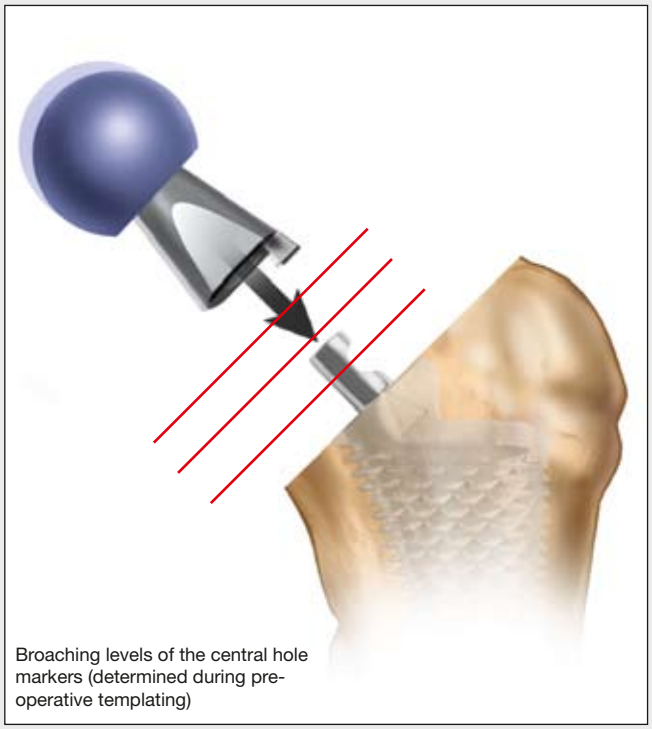


Figure 35

Ensure that any remaining superior lateral femoral neck is cleared to avoid varus stem placement. If required, release a small portion of the gluteus medius to facilitate exposure and trim any overhanging trochanter. Progressively increase the size of the broach until the final broach is fully seated in the femur with the broach's marker point in the neutral position, level with the neck resection level, or at the level determined during pre-operative templating (Figure 35). The marker point corresponds to the central hole mark on the implant.

The final broach should confirm the size templated pre-operatively and determine the final implant size. The C-Stem™ broach system was designed to incorporate a circumferential 2 mm cement mantle. The 2 mm cement mantle does not include the additional cement mantle created by cement interdigitation into the cancellous bone structure.

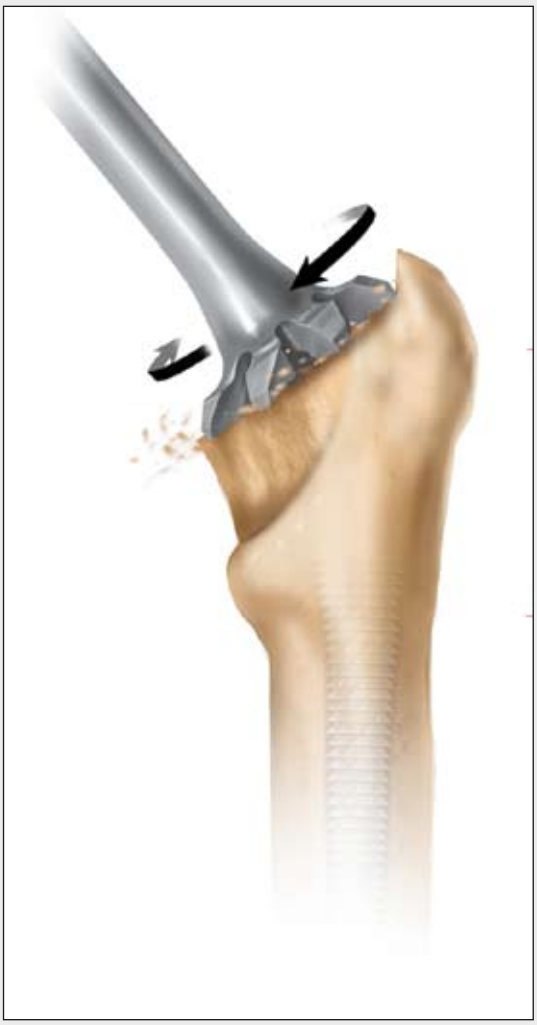


Figure 36

Calcar Planing

Since the C-Stem™ AMT Stem is a collarless stem, it can be positioned proximally or distally to the neck cut. Therefore, calcar planing is not mandatory; however, it is advisable in order to facilitate seating the actual prosthesis to the same level as the broach. Position the centre hole of the planer over the broach trunnion and plane the bone until it is level with the proximal surface of the broach (Figure 8).

Femoral Neck Trial Assembly

Attach the appropriate neck segment to the broach. Multiple trial heads are available to allow for proper restoration of hip biomechanics (22.225 mm, 26 mm, 28 mm, 32 mm, 36 mm heads). The C-Stem™ AMT Stem offers dual offsets in all 8 sizes.

If the femoral neck resection level is correct for proper leg length restoration, but there is still inadequate soft tissue abductor muscle tension, consider a high offset neck segment. This will increase the offset and the soft tissue tension without affecting leg length If the high offset neck segment is used, the offset will be increased by 6 - 8 mm depending on stem size:

Sizes 1 - 3 HO = 6 mm offset

Sizes 4 - 8 HO = 8 mm offset

Trial Reduction

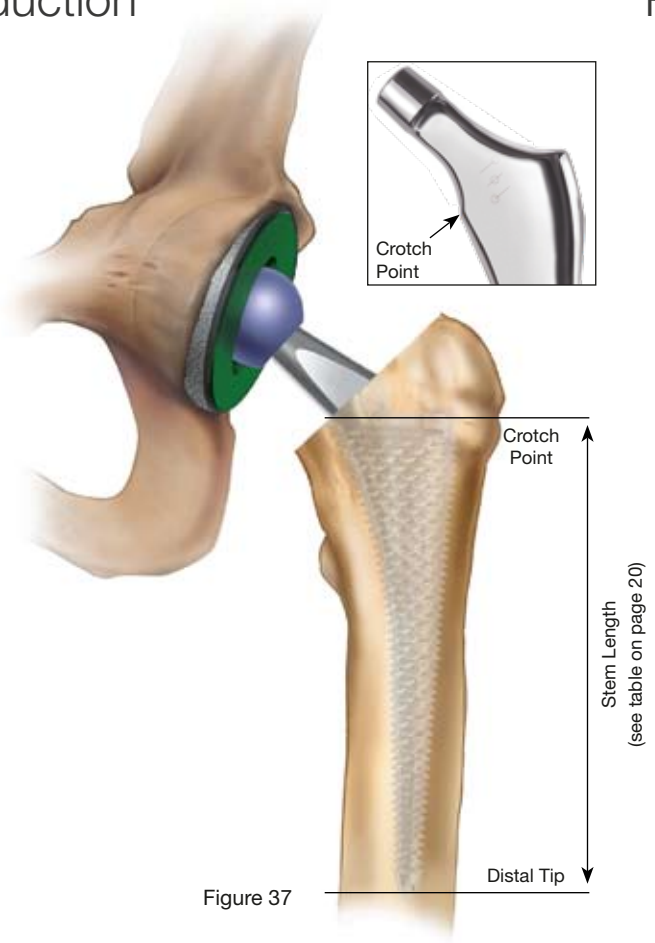


Figure 37

Trial Reduction

Use a combination of neck segment and trial head sizes to restore joint stability with an adequate range of motion. To assess stability for each combination, check external rotation in extension to rule out anterior dislocation. Also perform a posterior dislocation test, bringing the hip up to 90° of flexion with internal rotation. Once adequate stability is achieved, note the neck segment (standard or high) and the trial head chosen (Figure 37).

If the Pinnacle™ Cementless Cup System is to be implanted, a comprehensive range of trial inserts is available which offers a further dimension for adjustment at this stage (see Pinnacle™ Cup Surgical Technique Cat No: 9068-080-050).

Broach Removal

Remove the broach using the broach handle or broach extractor. Clean the canal to remove loose cancellous bone using a curette.

Cement Restriction

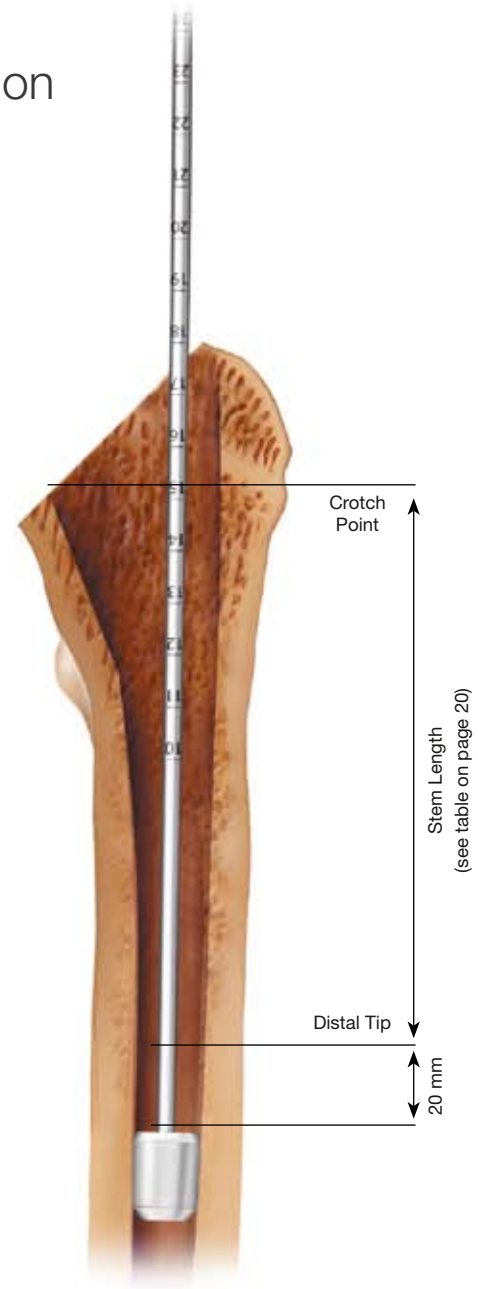


Figure 38

Inserting the Cement Restrictor

Use pulsatile lavage to clear the femoral canal of debris and open the interstices of the bone.

Based on the size predetermined whilst templating, attach the size of trial cement restrictor to the cement restrictor inserter and insert the trial to the planned depth. (See table on page 20). Check that it is firmly seated in the canal. Remove the trial and replace it with the corresponding restrictor implant. Insert the PE cement restrictor implant at the same level as the restrictor trial (Figures 38 & 39).

Figure 39

Figure 40

Insertion Depth Table

Size	Stem Length - Crotch Point to Distal Tip	Restrictor Depth
CDH (C- Stem™ only)	103 mm	123 mm
1	106 mm	126 mm
2	110.5 mm	130 mm
3	115 mm	135 mm
4	19.7 mm	140 mm
5	124 mm	144 mm
6	128.5 mm	149 mm
7	133 mm	153 mm
8	137.5 mm	158 mm

Irrigate the canal using pulsatile lavage with saline solution, ensuring that all debris is removed (Figure 35).

Pass a swab down the femoral canal to help dry and remove any remaining debris. The swab may also be pre-soaked in an epinephrine or hydrogen peroxide solution.

Distal Centraliser Selection

Figure 41

Select the void centraliser size that corresponds to the femoral canal diameter (determined either by the size of the last reamer used or by using the Canal Sizers):

Reamer Size	Void Centraliser Size
10 mm, 11 mm	Size 10
12 mm, 13 mm	Size 12
14 mm, 15 mm	Size 14
16 mm, 17 mm	Size 16
18 mm, 19 mm	Size 18
20 mm	Size 20

Select the centraliser size that corresponds to the size of the PE cement restrictor:

Code	Description Centraliser	Void Centraliser Size
546010000	PE cement restrictor size 1	Use End Cap Only
546012000	PE cement restrictor size 2	10
546014000	PE cement restrictor size 3	12
546016000	PE cement restrictor size 4	14
546018000	PE cement restrictor size 5	16
546020000	PE cement restrictor size 6	18
546022000	PE cement restrictor size 7	20

Attaching the Void Centraliser

Select the C-Stem™ void centraliser that corresponds to the diameter of the femoral canal (C-Stem™ Void Centralisers increase in 2 mm increments from 10 - 20 mm). After selecting the right size of centraliser, slide it over the distal tip of the stem and push the end over the tip of the stem.

Ensure that one of the fins is aligned with the lateral edge of the stem.

Refer to the diameters of the final reamer and cement restrictor since this will provide a useful guide. Alternatively use the Canal Sizers. Ensure the Centraliser is placed with the fins distal as shown. Push the end cap firmly over the stem's tip (Figure 41).

Note: The void centraliser should not be used if the smallest diameter of the femoral canal is less than 10 mm at the level of the stem tip. An end cap on its own should be used.

Cementing Technique

Figure 42

Figure 43

Cement Technique

Mix CMW® bone cement using the Cemvac® Vacuum Mixing System. Attach the syringe to the Cemvac® cement injection gun. Assess the viscosity of the cement. The cement is ready for insertion when it has taken on a dull, doughy appearance and does not adhere to the surgeon's glove. Start at the distal part of the femoral canal and inject the cement in a retrograde fashion, allowing the cement to push the nozzle gently back, until the canal is completely filled and the distal tip of the nozzle is clear of the canal (Figure 42).

Cut the nozzle and place a DePuy femoral pressuriser over the end. The CMW® cement should be pressurised to allow good interdigitation of the cement into the trabecular bone. Continually inject cement during the period of pressurisation (Figure 43). Use the Femoral Prep Kit curettes to remove excess bone cement. Implant insertion can begin when the cement can be pressed together without sticking to itself.

For full description, please see the CMW® Cementing Surgical Technique, Cat No: 4010-030-000.

Femoral Stem Implantation

Figure 44

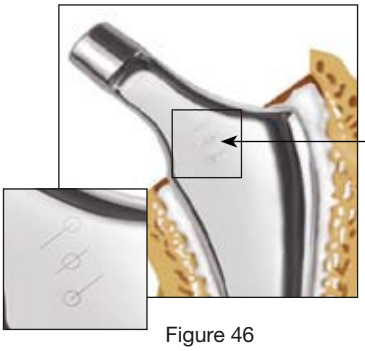


Figure 46

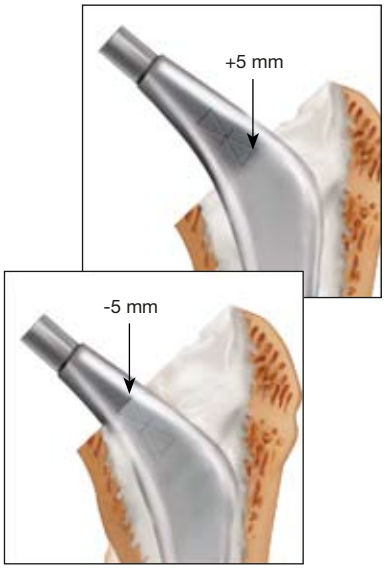


Figure 45

Inserting the C-Stem™ Implant

An identical technique is used for C-Stem™ & C-Stem™AMT implants.

Place the stem inserter in the oval location hole with the "M" pointing to the medial direction. Angle the inserter tip slightly to help push the stem into a neutral position (Figure 44).

Introduce the implant in line with the long axis of the femur. Its entry point should be lateral, close to the greater trochanter. During stem insertion maintain thumb pressure on the cement at the medial femoral neck ensuring stem is in the middle of the prepared cavity.

The stem is correctly seated when the middle marking on the stem is level with the neck resection (Figure 45*). The additional lines allow the implant to be raised to increase or decrease leg length, without adjusting the offset. It should be noted that raising or lowering the stem with respect to the neck resection will increase or decrease the proximo-medial cement mantle thickness respectively. Remove excess cement with a curette. Maintain pressure until the cement is completely polymerised.

***Note: The resection guide lines differ on the C-Stem™ AMT Stem as indicated in Figure 46.**

Femoral Head Impaction

Figure 47

Figure 48

Impacting the Femoral Head

Place the trial head on the implant and perform a final trial reduction (Figure 47). Remove the trial head and irrigate and thoroughly clean the prosthesis to ensure the taper is free of debris.

Place the appropriate metal head onto the taper and lightly tap the head into place using the head impactor. Reduce the hip to carry out a final assessment of joint mechanics and stability (Figure 48).

Note: Twist ceramic heads on the cleaned stem taper and lightly impact.

Closure

Closure is based on the surgeon's preference and the individual case. The repair should be tested throughout the hip range of motion.

Appendix 1 - Optional Reaming

Figure 1

Figure 2

The C-Stem™ Hip System is designed as a broach-only system, to maximise the strength of the bone / cement interface. C-Stem™ Hip System reamers are available for surgeons who prefer to ream the intramedullary canal; however, aggressive reaming is not recommended. **Perform any reaming by hand and not by power, which prevents burnishing of the endosteal surface and compromising the cement's ability to interdigitate into the stable cancellous bone.**

Attach the smallest distal reamer to a T-Handle and progressively increase the reamer diameter until adequate femoral canal clearing is achieved. Clear the canal without disturbing quality cancellous bone, which is needed for bone cement interdigitation (Figure 1).

The depth marks along the reamer shaft correspond to stem size, and reaming should stop when the appropriate depth mark is level with the femoral head, which generally corresponds to the tip of the trochanter. Leave the final distal reamer in place. If the reamer is not centred in the pilot hole, the pilot hole is not correctly positioned and should be enlarged. Note the reamer size used since this information will help determine the appropriate restrictor and distal centraliser.

Note: The surgeon may resect the head before canal reaming using the neck resection template.

Alternative Femoral Neck Resection

Figure 3

Neck Resection

Set the calliper to the distance measured during pre-operative templating between the superomedial point of the femoral head and the level of resection. Place one leg of the calliper on the superomedial point of the femoral head. Mark the level of resection where the point of the other leg touches the medial cortex (Figure 2).

Introduce the neck resection guide over the canal probe or distal reamer. Ensure the guide touches the femoral head and the anterior cortex of the greater trochanter.

Align the appropriate saw guide with the resection mark. There are two saw guide slots, one for Standard and the other for CDH stems (Figure 3). Both are clearly marked on the template. Perform an osteotomy on the femoral neck using an oscillating saw. Remove the resection guide and the distal reamer once a sufficiently deep cut has been made. Complete the neck resection and remove the femoral head.

Appendix 2 - Using the C-Stem™ to C-Stem™ AMT Conversion Kit

Figure 4

Neck Resection Angle

The intramedullary stem geometry of both C-Stem™ Hip System variants is identical, so either a C-Stem™ broach or a C-Stem™ AMT broach can be used to create the cavity for the C-Stem™ AMT implant. The neck resection angle on an implant is typically mirrored by the resection angle on the corresponding broach. However, the resection angles vary by 5° between the original C-Stem™ and the C-Stem™ AMT implants (Figure 4).

Therefore when using the original C-Stem™ broaches to create a cavity for the C-Stem™ AMT implant, there is the potential that the small variation will be detected, depending upon the accuracy of the initial osteotmy.

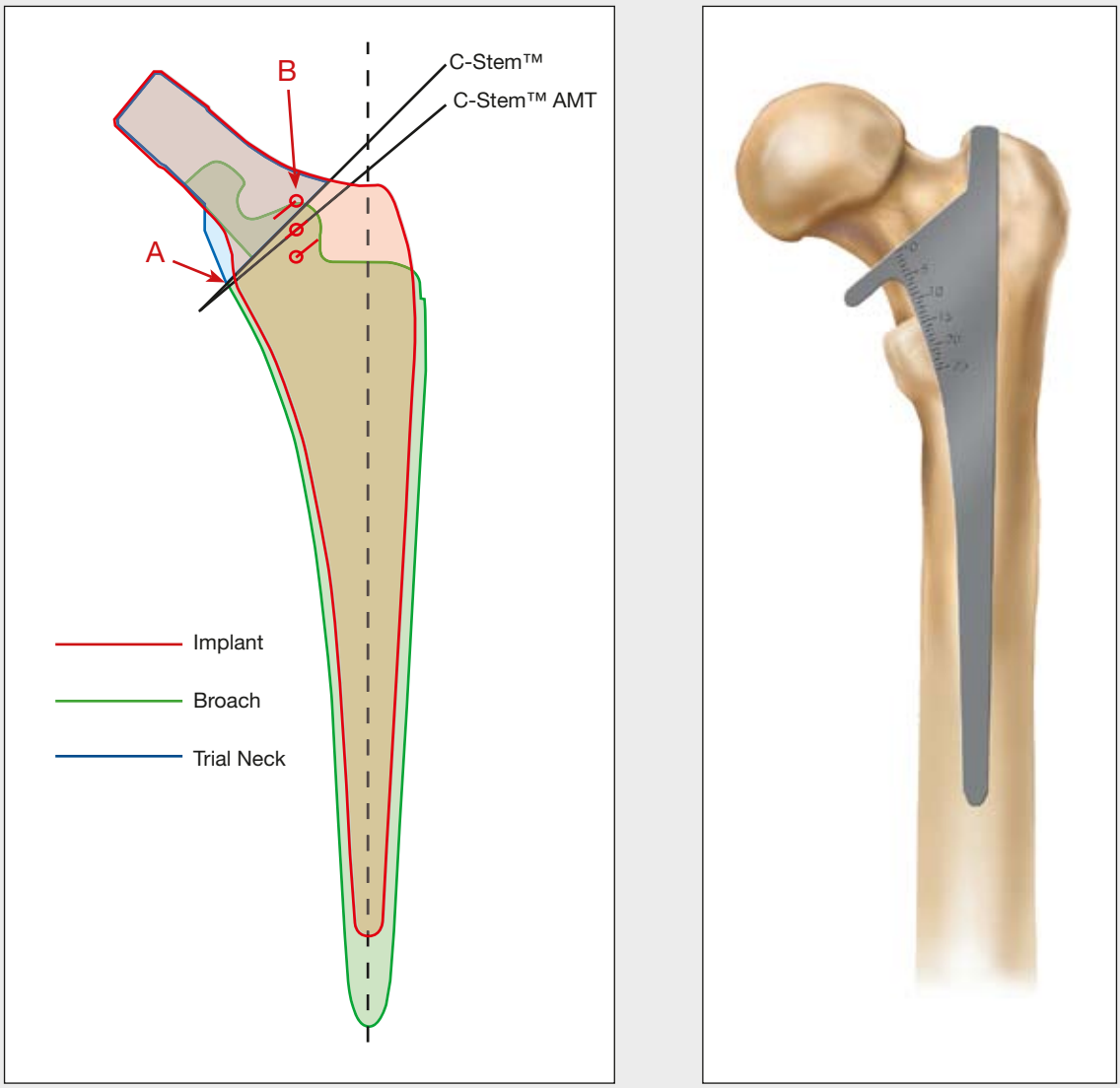


Figure 5

Overlay

The resection angle on the C-Stem™ AMT broach and C-Stem™ AMT implant are the same (Figure 5). There is no difference between C-Stem™ broach and AMT implant at the medial point (A) (Figure 5). There is the potential for a difference of 1.5 mm between C-Stem™ broach and AMT implant to be seen level with marking (B). This difference is only apparent if the neck resection is made at 50° or higher.

Note: There is no increased potential for leg length discrepancies. Should the discrepancy be detected intraoperatively, line up the medial point of the implant (A) with the medial point neck resection.

Ordering Information - C-Stem™

C-Stem™ Core Instrument Kit

2001-65-000 Excel™ Femoral Head Impactor

2522-00-502 Stem Introducer

856696 C-Stem™ Diamond Broach Handle

855949 C-Stem™ Diamond Broach Remover

9611-91-500 C-Stem™ Diamond Broach Size 1
9611-92-500 C-Stem™ Diamond Broach Size 2
9611-93-500 C-Stem™ Diamond Broach Size 3
9611-94-500 C-Stem™ Diamond Broach Size 4
9611-95-500 C-Stem™ Diamond Broach Size 5
9611-96-500 C-Stem™ Diamond Broach Size 6

9612-19-500 C-Stem™ Diamond Broach Instrument Case

9612-20-501 C-Stem™ Diamond Broach Trial Neck Size CDH
9612-01-501 C-Stem™ Diamond Broach Trial Neck Size 1
9612-02-501 C-Stem™ Diamond Broach Trial Neck Size 2
9612-03-501 C-Stem™ Diamond Broach Trial Neck Size 3
9612-04-501 C-Stem™ Diamond Broach Trial Neck Size 4
9612-05-501 C-Stem™ Diamond Broach Trial Neck Size 5
9612-06-501 C-Stem™ Diamond Broach Trial Neck Size 6

9612-12-501 C-Stem™ Diamond Broach Trial Neck Size 2 High Offset
9612-13-501 C-Stem™ Diamond Broach Trial Neck Size 3 High Offset
9612-14-501 C-Stem™ Diamond Broach Trial Neck Size 4 High Offset
9612-15-501 C-Stem™ Diamond Broach Trial Neck Size 5 High Offset

Individual Instruments

2001-42-000 Excel™ T-Handle

2001-43-000 Excel™ Intra Medullary Initiator

2354-10-000 Muller Awl Reamer With Hudson End

2002-25-000 Anteversion Osteotome Medium

9611-90-500 C-Stem™ Diamond Broach Size CDH

9613-13-000 Primary C-Stem™ X-Ray Templates
9613-14-000 Revision C-Stem™ X-Ray Templates
9613-13-500 C-Stem™ Asian Templates

Diamond Broach & Neck Trial Kit Size 7 & 8

9611-97-500 C-Stem™ Diamond Broach Size 7
9611-98-500 C-Stem™ Diamond Broach Size 8

9612-07-501 C-Stem™ Diamond Broach Trial Neck Size 7
9612-08-501 C-Stem™ Diamond Broach Trial Neck Size 8

C-Stem™ Neck Resection Kit

9612-09-000 Neck Resection Guide
9751-90-000 Neck Resection Calliper
9614-16-000 Neck Resection Osteotomy Template

Ordering Information - C-Stem™

C-Stem™ Canal Reamer Kit

9611-75-000	Canal Reamer 8 mm
9611-76-000	Canal Reamer 9 mm
9611-77-000	Canal Reamer 10 mm
2105-14-000	Canal Reamer 11 mm
9611-79-000	Canal Reamer 12 mm
9611-80-000	Canal Reamer 13 mm
9611-81-000	Canal Reamer 14 mm
9611-82-000	Canal Reamer 15 mm
9611-83-000	Canal Reamer 16 mm
9611-84-000	Canal Reamer 17 mm
9611-85-000	Canal Reamer 18 mm
9611-86-000	Canal Reamer 19 mm
9611-87-000	Canal Reamer 20 mm
2611-30-000	C-Stem™ Femoral Reamer Case

Trial Heads 22.225 mm

2522-22-001	Trial Head 22.225 - 3
2522-22-002	Trial Head 22.225 +0
2522-22-003	Trial Head 22.225 +3
2522-22-004	Trial Head 22.225 +6

Trial Heads 26 mm

2522-26-001	Trial Head 26 - 3
2522-26-002	Trial Head 26 +0
2522-26-003	Trial Head 26 +3

Trial Heads 28 mm

2522-28-001	Trial Head 28 - 3
2522-28-002	Trial Head 28 +0
2522-28-003	Trial Head 28 +3
2522-28-004	Trial Head 28 +6

28 mm 9/10 Alternative Bearing (AB) Head Trial

9611-56-000	Alternative Bearing Head Trial Neck Length - 3
9611-57-000	Alternative Bearing Head Trial Neck Length +0
9611-58-000	Alternative Bearing Head Trial Neck Length +3
9611-59-000	Alternative Bearing Head Trial Neck Length +6

36 mm 9/10 Alternative Bearing (AB) Head Trial

9608-08-001	36 mm 9/10 Alternative Bearing Head Trial Neck Length - 3
9608-09-001	36 mm 9/10 Alternative Bearing Head Trial Neck Length +0
9608-10-001	36 mm 9/10 Alternative Bearing Head Trial Neck Length +3
9608-11-001	36 mm 9/10 Alternative Bearing Head Trial Neck Length +6

Individual Codes Trial Heads 32 mm

2522-32-001	Elite™ Implant Trial Head 32 mm - 3
2522-32-002	Elite™ Implant Trial Head 32 mm +0
2522-32-003	Elite™ Implant Trial Head 32 mm +3

C-Stem™ Femoral Implants

9611-60-000	C-Stem™ CDH

9611-61-000	C-Stem™ Size 1 Primary
9611-62-000	C-Stem™ Size 2 Primary
9611-63-000	C-Stem™ Size 3 Primary
9611-64-000	C-Stem™ Size 4 Primary
9611-65-000	C-Stem™ Size 5 Primary
9611-66-000	C-Stem™ Size 6 Primary
9611-67-000	C-Stem™ Size 7 Primary
9611-68-000	C-Stem™ Size 8 Primary

9613-15-000	C-Stem™ High Offset Size 2
9611-70-000	C-Stem™ High Offset Size 3
9611-72-000	C-Stem™ High Offset Size 4
9611-74-000	C-Stem™ High Offset Size 5

9613-07-000	C-Stem™ Size 4 Revision 200
9613-08-000	C-Stem™ Size 4 Revision 240
9613-09-000	C-Stem™ Size 6 Revision 200
9613-10-000	C-Stem™ Size 6 Revision 240
9613-11-000	C-Stem™ Size 8 Revision 200
9613-12-000	C-Stem™ Size 8 Revision 240

9611-00-000	C-Stem™ Size 0A
9611-00-500	C-Stem™ Size 1A
9611-01-500	C-Stem™ Size 2A
9611-02-500	C-Stem™ Size 3A

Cement Restrictors (Polyethylene)

5460-10-000	Cement Restrictor Size 1
5460-12-000	Cement Restrictor Size 2
5460-14-000	Cement Restrictor Size 3
5460-16-000	Cement Restrictor Size 4
5460-18-000	Cement Restrictor Size 5
5460-20-000	Cement Restrictor Size 6
5460-22-000	Cement Restrictor Size 7

Ordering Information - C-Stem™

C-Stem™ Femoral Trials Core Sizes

9611-88-000	Peg For C-Stem™ Trial Stem
9614-02-000	C-Stem™ Trial Femoral CDH
9614-03-000	C-Stem™ Trial Femoral Size 1
9614-04-000	C-Stem™ Trial Femoral Size 2
9614-05-000	C-Stem™ Trial Femoral Size 3
9614-06-000	C-Stem™ Trial Femoral Size 4
9614-07-000	C-Stem™ Trial Femoral Size 5
9614-08-000	C-Stem™ Trial Femoral Size 6
9613-16-000	C-Stem™ Trial Femoral Size 2 High Offset
9614-11-000	C-Stem™ Trial Femoral Size 3 High Offset
9614-12-000	C-Stem™ Trial Femoral Size 4 High Offset
9614-13-000	C-Stem™ Trial Femoral Size 5 High Offset

Individual Codes

9614-09-000	C-Stem™ Trial Femoral Size 7
9614-10-000	C-Stem™ Trial Femoral Size 8

C-Stem™ Revision Femoral Trials

9612-34-000	C-Stem™ Revision Trial Femoral Size 4 200
9612-35-000	C-Stem™ Revision Trial Femoral Size 4 240
9612-36-000	C-Stem™ Revision Trial Femoral Size 6 200
9612-37-000	C-Stem™ Revision Trial Femoral Size 6 240
9612-38-000	C-Stem™ Revision Trial Femoral Size 8 200
9612-39-000	C-Stem™ Revision Trial Femoral Size 8 240
9612-18-000	C-Stem™ Instrument Tray 2 - Trial Stems

C-Stem™ Asian Sizes Kit

9614-03-500	C-Stem™ Trial Stem Size 0A
9614-00-500	C-Stem™ Trial Stem Size 1A
9614-01-500	C-Stem™ Trial Stem Size 2A
9614-02-500	C-Stem™ Trial Stem Size 3A
9610-79-500	C-Stem™ Asian Trial Neck Size 0
9611-99-500	C-Stem™ Asian Trial Neck Size 1
9612-99-500	C-Stem™ Asian Trial Neck Size 2
9613-99-500	C-Stem™ Asian Trial Neck Size 3

9611-83-500	C-Stem™ Broach Size 0A
9611-80-500	C-Stem™ Broach Size 1A
9611-81-500	C-Stem™ Broach Size 2A
9611-82-500	C-Stem™ Broach Size 3A

Elite™ Modular Heads 9/10 Taper

9627-30-000	22.225 mm Elite™ Modular Head - 3
9625-67-000	22.225 mm Elite™ Modular Head +0
9627-31-000	22.225 mm Elite™ Modular Head +3
9625-29-000	22.225 mm Elite™ Modular Head +6

9625-69-000	26 mm Elite™ Modular Head - 3
9625-70-000	26 mm Elite™ Modular Head +0
9627-32-000	26 mm Elite™ Modular Head +3

9625-72-000	28 mm Elite™ Modular Head - 3
9625-73-000	28 mm Elite™ Modular Head +0
9627-34-000	28 mm Elite™ Modular Head +3
9627-47-000	28 mm Elite™ Modular Head +6

9625-74-000	32 mm Elite™ Modular Head - 3
9625-75-000	32 mm Elite™ Modular Head +0
9627-35-000	32 mm Elite™ Modular Head +3

9621-73-000	28 mm Elite™ Alumina Ceramic Head - 3
9621-74-000	28 mm Elite™ Alumina Ceramic Head +0

22.225 mm 9/10 Ceramax™ Head

1365-22-110	22.225 mm 9/10 Ceramax™ Head Neck Length - 3
1365-22-120	22.225 mm 9/10 Ceramax™ Head Neck Length +0*

(*) Note: Must not be used with CoCr Tapers

28 mm 9/10 Ceramax™ Head

1365-28-110	28 mm 9/10 Ceramax™ Head Neck Length - 3
1365-28-120	28 mm 9/10 Ceramax™ Head Neck Length +0
1365-28-130	28 mm 9/10 Ceramax™ Head Neck Length +3

32 mm 9/10 Ceramax™ Head

1365-32-110	32 mm 9/10 Ceramax™ Head Neck Length - 3
1365-32-120	32 mm 9/10 Ceramax™ Head Neck Length +0
1365-32-130	32 mm 9/10 Ceramax™ Head Neck Length +3

36 mm 9/10 Ceramax™ Head

1365-36-110	36 mm 9/10 Ceramax™ Head Neck Length - 3
1365-36-120	36 mm 9/10 Ceramax™ Head Neck Length +0
1365-36-130	36 mm 9/10 Ceramax™ Head Neck Length +3

Ordering Information - C-Stem™

28 mm 9/10 Ultamet™ Head

9627-00-100	28 mm 9/10 Ultamet™ Head Neck Length - 3
9627-01-100	28 mm 9/10 Ultamet™ Head Neck Length +0
9627-02-100	28 mm 9/10 Ultamet™ Head Neck Length +3
9627-03-100	28 mm 9/10 Ultamet™ Head Neck Length +6

36 mm 9/10 Ultamet™ Head

9627-10-000	36 mm 9/10 Ultamet™ Head Neck Length - 3
9627-11-000	36 mm 9/10 Ultamet™ Head Neck Length +0
9627-12-000	36 mm 9/10 Ultamet™ Head Neck Length +3
9627-13-000	36 mm 9/10 Ultamet™ Head Neck Length +6

For Complete Code Listings for Pinnacle™ please use 9080-10-000 Pinnacle™ Reference Guide

C-Stem™ Cement Restrictor Kit

5460-02-000	Cement Restrictor Inserter

5460-30-000	Cement Restrictor Trial 1
5460-32-000	Cement Restrictor Trial 2
5460-34-000	Cement Restrictor Trial 3
5460-36-000	Cement Restrictor Trial 4
5460-38-000	Cement Restrictor Trial 5
5460-40-000	Cement Restrictor Trial 6
5460-42-000	Cement Restrictor Trial 7

End Caps & Centralisers

9612-21-000	C-Stem™ End Cap (Resorbable)
9612-26-000	C-Stem™ End Cap (PMMA)

Void Centralisers

9612-10-500	C-Stem™ Void Centraliser Size 10
9612-12-500	C-Stem™ Void Centraliser Size 12
9612-14-500	C-Stem™ Void Centraliser Size 14
9612-16-500	C-Stem™ Void Centraliser Size 16
9612-18-500	C-Stem™ Void Centraliser Size 18
9612-20-500	C-Stem™ Void Centraliser Size 20

Cemvac® Vacuum Mixing System

Hardware

831401	DePuy Multi-Pressure Vacuum Pump
3210031	International Air Hose
831202	Syringe Holder
831205	Cemvac® 1 Piece Gun
3210016	Nozzle Cutter

Disposables

831215	Single Syringe Set (Box 20 x 1 single sterile pack)
831220	Double Syringe Set (Box 10 x 2 double sterile pack)
831230	Revision Nozzle (8.5 mm x 5)
831231	Revision Nozzle (6.5 mm x 5)
831234	Nozzle Adaptor 90 Degree (x 5)
831235	Tibial Bone Applicator (x 5)

CMW® Bone Cements

3102040	SmartSet® MV Medium Viscosity Bone Cement 40g
3092040	SmartSet® HV High Viscosity Bone Cement 40g

CMW® Gentamicin Antibiotic Bone Cements

3105040	SmartSet® GMV Medium Viscosity Gentamicin Bone Cement 40g
3095040	SmartSet® GHV High Viscosity Gentamicin Bone Cement 40g

Ordering Information - C-Stem™ AMT

C-stem™ AMT Core Instrument Kit

2580-00-010	C-Stem™ AMT Broach Size 1
2580-00-011	C-stem™ AMT Broach Size 2
2580-00-012	C-stem™ AMT Broach Size 3
2580-00-013	C-stem™ AMT Broach Size 4
2580-00-014	C-stem™ AMT Broach Size 5
2580-00-015	C-stem™ AMT Broach Size 6
2580-00-016	C-stem™ AMT Broach Size 7
2580-00-017	C-stem™ AMT Broach Size 8
2580-00-060	C-stem™ AMT Tray-femoral Prep
2580-00-061	C-stem™ AMT Tray-broaches
2580-00-056	C-stem™ AMT X-ray Templates
2570-01-600	Summit™ Univ Neck Res Guide

2522-00-502	Stem Introducer
2570-00-000	Summit™ Universal Broach Handle
2570-00-002	Summit™ Broach Extractor
2570-00-005	Summit™ Lateraliser

2001-65-000	Excel™ Femoral Head Impactor
853927	P.F.C.® Femoral Rasp
854673	Box Osteotome

2002-25-000	Anteversion Osteotome Medium
853928	P.F.C.® Broach Hand Align Rod

2354-10-000	Muller Awl Reamer W/Hudson End
2570-20-000	Canal Sizers Size 8-9
2570-21-000	Canal Sizers Size 10 -11
2570-22-000	Canal Sizers Size 12-13
2570-23-000	Canal Sizers Size 14-15
2570-24-000	Canal Sizers Size 16-17
2001-80-501	IM Initiator Sized

2570-03-000	Summit™ Size 0/1 Standard Neck Segment
2570-03-050	Summit™ Size 0/1 Hi Neck Segment
2570-03-100	Summit™ Size 2/3 Standard Neck Segment
2570-03-150	Summit™ Size 2/3 Hi Neck Segment
2570-03-200	Summit™ Size 4/5 Standard Neck Segment
2570-03-250	Summit™ Size 4/5 Hi Neck Segment
2570-03-300	Summit™ Size 6/7 Standard Neck Segment
2570-03-350	Summit™ Size 6/7 Hi Neck Segment
2570-03-400	Summit™ Size 8/9 Standard Neck Segment
2570-03-450	Summit™ Size 8/9 Hi Neck Segment

200142000	Excel™ T-Handle

C-Stem™ to C-Stem™ AMT Conversion Kit

2580-00-045	C-Stem™ To AMT Hi Neck Sg 1
2580-00-046	C-Stem™ To AMT Hi Neck Sg 2
2580-00-047	C-Stem™ To AMT Hi Neck Sg 3
2580-00-048	C-Stem™ To AMT Hi Neck Sg 4
2580-00-049	C-Stem™ To AMT Hi Neck Sg 5
2580-00-050	C-Stem™ To AMT Hi Neck Sg 6
2580-00-051	C-Stem™ To AMT Hi Neck Sg 7
2580-00-052	C-Stem™ To AMT Hi Neck Sg 8
2580-00-034	C-Stem™ To AMT Standard Neck Sg 1
2580-00-035	C-Stem™ To AMT Standard Neck Sg 2
2580-00-036	C-Stem™ To AMT Standard Neck Sg 3
2580-00-037	C-Stem™ To AMT Standard Neck Sg 4
2580-00-038	C-Stem™ To AMT Standard Neck Sg 5
2580-00-039	C-Stem™ To AMT Standard Neck Sg 6
2580-00-040	C-Stem™ To AMT Standard Neck Sg 7
2580-00-041	C-Stem™ To AMT Standard Neck Sg 8
2580-00-056	C-Stem™ AMT X-ray Templates
2580-00-059	C-Stem™ To AMT Conversion Kit
2570-20-000	Canal Sizers Size 8-9
2570-21-000	Canal Sizers Size 10 -11
2570-22-000	Canal Sizers Size 12-13
2570-23-000	Canal Sizers Size 14-15
2570-24-000	Canal Sizers Size 16-17
2570-00-005	Summit™ Lateraliser
2570-01-600	Summit™ Univ Neck Res Guide

Ordering Information - C-Stem™ AMT

Summit™ to C-Stem™ AMT Conversion Kit

2580-00-010	C-Stem™ AMT Broach Size 1
2580-00-011	C-Stem™ AMT Broach Size 2
2580-00-012	C-Stem™ AMT Broach Size 3
2580-00-013	C-Stem™ AMT Broach Size 4
2580-00-014	C-Stem™ AMT Broach Size 5
2580-00-015	C-Stem™ AMT Broach Size 6
2580-00-016	C-Stem™ AMT Broach Size 7
2580-00-017	C-Stem™ AMT Broach Size 8
2580-00-058	C-Stem™ AMT Broach Instrument Tray
2580-00-056	C-Stem™ AMT X-ray Templates

2522-00-502	Stem Introducer

Articul/eze® Trial Heads 22.225 mm

2530-69-000	Articul/eze® Trial Head 22.225 +4
2530-70-000	Articul/eze® Trial Head 22.225 +7

Articul/eze® 12/14 Trial Heads 26 mm

2530-71-000	Articul/eze® Trial Head 26 +4
2530-72-000	Articul/eze® Trial Head 26 +7
2530-73-000	Articul/eze® Trial Head 26 +10

Articul/eze® 12/14 Trial Heads 28 mm

2530-81-000	Articul/eze® Trial Head 28 +1.5
2530-82-000	Articul/eze® Trial Head 28 +5
2530-83-000	Articul/eze® Trial Head 28 +8.5
2530-84-000	Articul/eze® Trial Head 28 +12
2530-85-000	Articul/eze® Trial Head 28 +15.5

Articul/eze® 12/14 Trial Heads 32 mm

2530-91-000	Articul/eze® Trial Head 32 +1
2530-92-000	Articul/eze® Trial Head 32 +5
2530-93-000	Articul/eze® Trial Head 32 +9
2530-94-000	Articul/eze® Trial Head 32 +13
2530-95-000	Articul/eze® Trial Head 32 +17

Articul/eze® 12/14 Trial Heads 36 mm

2531-50-000	Articul/eze® Trial Head 36 -2
2531-51-000	Articul/eze® Trial Head 36 +1.5
2531-52-000	Articul/eze® Trial Head 36 +5
2531-53-000	Articul/eze® Trial Head 36 +8.5
2531-54-000	Articul/eze® Trial Head 36 +12

C-Stem™ AMT Femoral Implants

	C-Stem™ AMT Size 1 Standard Offset
1570-04-085	C-Stem™ AMT Size 2 Standard Offset
1570-04-090	C-Stem™ AMT Size 3 Standard Offset
1570-04-100	C-Stem™ AMT Size 4 Standard Offset
1570-04-110	C-Stem™ AMT Size 5 Standard Offset
1570-04-120	C-Stem™ AMT Size 6 Standard Offset
1570-04-135	C-Stem™ AMT Size 7 Standard Offset
1570-04-150	C-Stem™ AMT Size 8 Standard Offset

1570-14-070	C-Stem™ AMT Size 1 High Offset
1570-14-085	C-Stem™ AMT Size 2 High Offset
1570-14-090	C-Stem™ AMT Size 3 High Offset
1570-14-100	C-Stem™ AMT Size 4 High Offset
1570-14-110	C-Stem™ AMT Size 5 High Offset
1570-14-120	C-Stem™ AMT Size 6 High Offset
1570-14-135	C-Stem™ AMT Size 7 High Offset
1570-14-150	C-Stem™ AMT Size 8 High Offset

Articul/eze® 12/14 Biolox® Delta Head 28 mm

1365-28-310	28 mm 12/14 Articul/eze® Biolox® Delta Head Neck Length +1.5
1365-28-320	28 mm 12/14 Articul/eze® Biolox® Delta Head Neck Length +5
1365-28-330	28 mm 12/14 Articul/eze® Biolox® Delta Head Neck Length +8.5

Articul/eze® 12/14 Biolox® Delta Head 32 mm

1365-32-310	32 mm 12/14 Articul/eze® Biolox® Delta Head Neck Length +1
1365-32-320	32 mm 12/14 Articul/eze® Biolox® Delta Head Neck Length +5
1365-32-330	32 mm 12/14 Articul/eze® Biolox® Delta Head Neck Length +9

Articul/eze® 12/14 Biolox® Delta Head 36 mm

1365-36-310	36 mm 12/14 Articul/eze® Biolox® Delta Head Neck Length +1.5
1365-36-320	36 mm 12/14 Articul/eze® Biolox® Delta Head Neck Length +5
1365-36-330	36 mm 12/14 Articul/eze® Biolox® Delta Head Neck Length +8.5
1365-36-340	36 mm 12/14 Articul/eze® Biolox® Delta Head Neck Length +12

Ordering Information - C-Stem™ AMT

Articul/eze® 12/14 Ultamet™ Head 28 mm

1365-11-500	28 mm 12/14 Articul/eze® Ultamet™ Head Neck Length +1.5
1365-12-500	28 mm 12/14 Articul/eze® Ultamet™ Head Neck Length +5
1365-13-500	28 mm 12/14 Articul/eze® Ultamet™ Head Neck Length +8.5

Articul/eze® 12/14 Ultamet™ Head 36 mm

1365-50-000	36 mm 12/14 Articul/eze® Ultamet™ Head Neck Length -2
1365-51-000	36 mm 12/14 Articul/eze® Ultamet™ Head Neck Length +1.5
1365-52-000	36 mm 12/14 Articul/eze® Ultamet™ Head Neck Length +5
1365-53-000	36 mm 12/14 Articul/eze® Ultamet™ Head Neck Length +8.5
1365-54-000	36 mm 12/14 Articul/eze® Ultamet™ Head Neck Length +12

For Complete Code Listings for Pinnacle™ please use 9080-10-000 Pinnacle™ Reference Guide

Modular Heads

9998-90-139	ASR™ Uni Femoral Implant Size 39
9998-90-141	ASR™ Uni Femoral Implant Size 41
9998-90-143	ASR™ Uni Femoral Implant Size 43
9998-90-145	ASR™ Uni Femoral Implant Size 45
9998-90-146	ASR™ Uni Femoral Implant Size 46
9998-90-147	ASR™ Uni Femoral Implant Size 47
9998-90-149	ASR™ Uni Femoral Implant Size 49
9998-90-151	ASR™ Uni Femoral Implant Size 51
9998-90-153	ASR™ Uni Femoral Implant Size 53
9998-90-155	ASR™ Uni Femoral Implant Size 55
9998-90-157	ASR™ Uni Femoral Implant Size 57
9998-90-159	ASR™ Uni Femoral Implant Size 59
9998-90-161	ASR™ Uni Femoral Implant Size 61
9998-90-163	ASR™ Uni Femoral Implant Size 63

ASR™ Tapered Sleeve Adaptor

9998-00-102	ASR™ Tapered Sleeve Adaptor 12/14 +2
9998-00-105	ASR™ Tapered Sleeve Adaptor 12/14 +5
9998-00-108	ASR™ Tapered Sleeve Adaptor 12/14 +8
9998-00-300	ASR™ Tapered Sleeve Adaptor 9/10 +0
9998-00-303	ASR™ Tapered Sleeve Adaptor 9/10 +3
9998-00-313	ASR™ Tapered Sleeve Adaptor 9/10 -2

References:

1. Wroblewski BM, et al. Triple Tapered Polished Cemented Stem in THA. J Arthrop, 2001.
2. O.S. Husby. A Randomised, Prospective, RSA Post Marketing Study Comparing SmartSet® HV and Palacos® R Bone Cement in THA, presented to the Norwegian Orthopaedic Association (NOA), Oslo, Norway, October 27th/28th 2005.

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