CHARNLEY® MODULAR HIP SYSTEM

This publication is not intended for distribution in the USA.

SURGICAL TECHNIQUE
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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 and clearly demonstrate the acetabular configuration and the endosteal and periosteal contours of the femoral head, neck and proximal femur.

Femoral Implant Size

A radiograph showing the AP view of the proximal femur, internally rotated 15°, provides the most important information: a level for the neck resection which will restore leg length; the appropriate neck offset for a natural position of the femoral head; and the lateral/medial dimensions of the femoral canal which determine the overall size of the implant.

The AP view also presents the position of the femur relative to the bony landmarks of the pelvis, and the correct anatomical position of the acetabular component relative to landmarks such as the tear drop.

The lateral view showing the amount of femoral bow, helps to confirm the diameter of the femoral canal and highlights abnormalities in this plane which might affect the position of the implant (Figure 1).

For sizing cement restrictor see page 18.
For sizing centraliser see page 20.
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 (Figure 2).

Templating for Cementless PINNACLE Acetabular Implant Size
Using the A/P radiograph, position the PINNACLE 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).
Anterolateral Approach

Use the approach with which you are most familiar and achieve the best surgical result. The CHARNLEY Modular 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).
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

Use the approach with which you are most familiar and achieve the best surgical result. The CHARNLEY Modular 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.
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 the 12 o’clock position 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

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). Accurate positioning of the entry point will avoid instrument and implant malalignment 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 CHARNLEY Modular Hip System is designed as a broach-only system, to maximise the strength of the bone/cement interface. CHARNLEY Modular Hip System reamers are available for surgeons who prefer to ream the intramedullary canal (see page 24). The Flanged 35 prosthesis requires the use of the recommended broach as a rasp to prepare the femur and a trial prosthesis is used to assess joint function and stability.

CHARNLEY Broach/CHARNLEY Modular Trial heads accommodate up to size 32 mm heads. Use of the trial prostheses is necessary to perform the assessment of joint function with 36 mm trial heads.

Neck Resection
The neck resection guide is used to establish the level (normally in the region of 1.5 cm above the lesser trochanter) and the angle of the neck resection (Figure 19). The straight edge of the guide is aligned with the long axis of the femur, the resection level is marked using diathermy and the neck is resected using an oscillating saw.

Note: The approach through piriformis fossa leads to neutral A/P and lateral stem positioning with the stem centralised within an even cement mantle.
**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 4 - 6 mm to ensure 2 - 3 mm cement mantle. 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 trimming aid for the OGEE® cup) attached to the cup introducer. Once the size is established, trim the rim of the OGEE trimming aid so that it just fits within the rim of the acetabulum. Use the trimming aid as a guide to trim the definitive OGEE cup (Figure 22).
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. Don 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 swabs 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 anteverion 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 RECONSTRUCTION

Figure 24

Acetabular Preparation
Acetabular preparation for PINNACLE cementless implantation 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.

Figure 25

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 the socket lies flush with a normal lateral pillar (Figure 25).
The implanted cup should be slightly more antverted 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**

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

At this point in the procedure a decision can finally be made whether to screw the cup into place (sector and multihole). This should be carried out with due consideration to bone quality, ensuring the appropriate length of screws are located within the ‘safe’ quadrant.

**Insert Trial Introduction**

Place the appropriate insert trial into the trial cup (Figure 27). Secure the insert trial to the cup trial through the apical hole screw using a standard hex head screwdriver.

A full description of this technique and the range of cup and insert options is available in the PINNACLE Surgical Technique DPEM/ORT/1112/0366(2).
Again, broaching should not be so aggressive that it strips away strong cortico-cancellous bone in the proximal femur.

To achieve a good cement mantle, the anatomical calcar may be cleared using an osteotome or curette, extending the medullary canal toward the lesser trochanter, but avoiding excavation of the lesser trochanter.

The final broach should confirm the size templated pre-operatively and determine the final implant size.
Femoral Neck Trial Head
Attach the appropriate trial head 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).

Charnley Modular Trial Head

Note: For Surgeons who use trial stems please use the ELITE™ trial heads.

The Flanged 35 prosthesis requires the use of the recommended broach as a rasp to prepare the femur and a trial prosthesis is used to assess joint function and stability.

CHARNLEY Broach/CHARNLEY Modular Trial heads accommodate up to size 32 mm heads. Use of the trial prostheses is necessary to perform the assessment of joint function with 36 mm trial heads.
Trial Reduction
Use the trial head with different size offsets 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 32).

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 Surgical Technique DPEM/ORT/1112/0366(2)).

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

Inserting the Cement Restrictor
Use pulsative lavage to clear the femoral canal of debris and open the interstices of the bone.

Attach the size of trial cement restrictor selected during pre-operative templating to fit the distal canal. Attach it to the cement restrictor inserter and insert the trial to the planned depth. Check that it is firmly seated in the canal. Remove the trial and replace it with the corresponding restrictor implant. Insert the restrictor implant at the same level as the restrictor trial (Figures 33 & 34).
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.

### Insertion Depth Table

<table>
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<th>Size</th>
<th>Stem Length (Crotch Point to Distal Tip)</th>
<th>Restrictor Depth</th>
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</thead>
<tbody>
<tr>
<td>Flanged 40</td>
<td>112 mm</td>
<td>132 mm</td>
</tr>
<tr>
<td>Extra Heavy Flanged 40</td>
<td>112 mm</td>
<td>132 mm</td>
</tr>
<tr>
<td>Roundback 40</td>
<td>113 mm</td>
<td>133 mm</td>
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<tr>
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<td>113 mm</td>
<td>133 mm</td>
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<tr>
<td>Narrow Roundback 45</td>
<td>113 mm</td>
<td>133 mm</td>
</tr>
<tr>
<td>Flanged 45</td>
<td>113 mm</td>
<td>133 mm</td>
</tr>
<tr>
<td>Extra Heavy Flanged 45</td>
<td>113 mm</td>
<td>133 mm</td>
</tr>
</tbody>
</table>
**Attaching the Centraliser**

Select the CHARNLEY Modular Centraliser that corresponds to the diameter of the femoral canal (refer to table). 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 (Figure 36).

<table>
<thead>
<tr>
<th>Size</th>
<th>Centraliser 1 Canal Size</th>
<th>Centraliser 2 Canal Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flanged 40</td>
<td>13.0-14.5 mm</td>
<td>15.0 mm+</td>
</tr>
<tr>
<td>Extra Heavy Flanged 40</td>
<td>15.0-16.5 mm</td>
<td>17.0 mm+</td>
</tr>
<tr>
<td>Roundback 40</td>
<td>13.0-14.5 mm</td>
<td>15.0 mm+</td>
</tr>
<tr>
<td>Roundback 40</td>
<td>13.0-14.5 mm</td>
<td>15.0 mm+</td>
</tr>
<tr>
<td>Narrow Roundback 45</td>
<td>13.0-14.5 mm</td>
<td>15.0 mm+</td>
</tr>
<tr>
<td>Flanged 45</td>
<td>13.0-14.5 mm</td>
<td>15.0 mm+</td>
</tr>
<tr>
<td>Extra Heavy Flanged 45</td>
<td>15.0-16.5 mm</td>
<td>17.0 mm+</td>
</tr>
</tbody>
</table>
CEMENTING TECHNIQUE

Cement Technique
Mix DePuy Synthes 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 37).

Cut the nozzle and place a DePuy Synthes femoral pressuriser over the end. The DePuy Synthes cement should be pressurised to allow good interdigitation of the cement into the trabecular bone. Continually inject cement during the period of pressurisation (Figure 38). 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.

A full description of this technique is available in the DePuy Synthes Cementing Surgical Technique Cat No: 4010-030-000.
Inserting the CHARNLEY Modular Implant

Place the stem inserter in the oval location hole. Angle the inserter tip slightly to help push the stem into a neutral position (Figure 39).

Introduce the implant in line with the long axis of the femur. Its entry point should be lateral, close to the greater trochanter. Do not use the neck cut as a reference. During insertion, thumb pressure is maintained on the cement at the medial femoral neck.

The stem is introduced until it reaches the templated level, and is seated approximately at the neck resection. Pressure is maintained until polymerisation is complete. A final trial reduction is carried out to confirm joint stability and joint movement.

The stem is correctly seated when the pre-operatively determined level is reached. Remove excess cement with a curette. Maintain pressure until the cement is completely polymerised.
Impacting the Femoral Head
Next, place the trial head on the implant and perform a final trial reduction (Figure 40). Remove the trial head and irrigate and clean the prosthesis to ensure the taper is free of debris. Place the appropriate 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 41).

Note: A ceramic head should be twisted on the stem and lightly impacted.

Closure
Closure is based on the surgeon’s preference and the individual case. The closure should be tested throughout the hip range of motion.
The CHARNLEY Modular Hip System is designed as a broach-only system, to maximise the strength of the bone / cement interface. CHARNLEY Modular 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 42).

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.
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 43).

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 44). 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 of the femoral head.
**ORDERING INFORMATION**

**Femoral Heads**

- **22.225 mm 9/10 CERAMAX® Head**
  - 22.225 mm 9/10 CERAMAX Head Neck Length -3
  - 22.225 mm 9/10 CERAMAX Head Neck Length +0
- **28 mm 9/10 CERAMAX Head**
  - 28 mm 9/10 CERAMAX Head Neck Length -3
  - 28 mm 9/10 CERAMAX Head Neck Length +0
- **32 mm 9/10 CERAMAX Head**
  - 32 mm 9/10 CERAMAX Head Neck Length -3
  - 32 mm 9/10 CERAMAX Head Neck Length +0
  - 32 mm 9/10 CERAMAX Head Neck Length +3

- **28 mm 9/10 ULTAMET™ Head**
  - 28 mm 9/10 ELITE Head Neck Length -3
  - 28 mm 9/10 ELITE Head Neck Length +0
  - 28 mm 9/10 ELITE Head Neck Length +3
  - 28 mm 9/10 ELITE Head Neck Length +6

- **36 mm 9/10 CERAMAX Head**
  - 36 mm 9/10 CERAMAX Head Neck Length -3
  - 36 mm 9/10 CERAMAX Head Neck Length +0
  - 36 mm 9/10 CERAMAX Head Neck Length +3

**28 mm 9/10 ULTAMET™ Head**

- 28 mm 9/10 ULTAMET™ Head Neck Length -3
- 28 mm 9/10 ULTAMET™ Head Neck Length +0
- 28 mm 9/10 ULTAMET™ Head Neck Length +3
- 28 mm 9/10 ULTAMET™ Head Neck Length +6

**22.225 mm ELITE Modular Heads 9/10 Taper**

- 22.225 mm ELITE Modular Head -3
- 22.225 mm ELITE Modular Head +0
- 22.225 mm ELITE Modular Head +3
- 22.225 mm ELITE Modular Head +6

**26 mm ELITE Modular Heads 9/10 Taper**

- 26 mm ELITE Modular Head -3
- 26 mm ELITE Modular Head +0
- 26 mm ELITE Modular Head +3

**28 mm ELITE Modular Heads 9/10 Taper**

- 28 mm ELITE Modular Head -3
- 28 mm ELITE Modular Head +0
- 28 mm ELITE Modular Head +3
- 28 mm ELITE Modular Head +6

**32 mm ELITE Modular Heads 9/10 Taper**

- 32 mm ELITE Modular Head -3
- 32 mm ELITE Modular Head +0
- 32 mm ELITE Modular Head +3

**For Complete Code Listings for PINNACLE please use:**

Pinnacle Product Code Catalogue DSEM/JRC/0615/0319

**Femoral Head Trials**

- **Trial Heads 22.225 mm**
  - 22.225 mm 9/10 CERAMAX Head Neck Length -3
  - 22.225 mm 9/10 CERAMAX Head Neck Length +0
  - 22.225 mm 9/10 CERAMAX Head Neck Length +3
  - 22.225 mm 9/10 CERAMAX Head Neck Length +6

- **Trial Heads 26 mm**
  - 26 mm 9/10 CERAMAX Head Neck Length -3
  - 26 mm 9/10 CERAMAX Head Neck Length +0
  - 26 mm 9/10 CERAMAX Head Neck Length +3

- **Trial Heads 28 mm**
  - 28 mm 9/10 CERAMAX Head Neck Length -3
  - 28 mm 9/10 CERAMAX Head Neck Length +0
  - 28 mm 9/10 CERAMAX Head Neck Length +3
  - 28 mm 9/10 CERAMAX Head Neck Length +6

- **Trial Heads 32 mm**
  - 32 mm 9/10 CERAMAX Head Neck Length -3
  - 32 mm 9/10 CERAMAX Head Neck Length +0
  - 32 mm 9/10 CERAMAX Head Neck Length +3
  - 32 mm 9/10 CERAMAX Head Neck Length +6

**Femoral Implants**

- **CHARNLEY Modular Femoral Prosthesis**
  - CHARNLEY Modular Femoral Prosthesis, CDH
  - CHARNLEY Modular Femoral Prosthesis, SNS 35
  - CHARNLEY Modular Femoral Prosthesis, Flanged 35
  - CHARNLEY Modular Femoral Prosthesis, Ex H 40
  - CHARNLEY Modular Femoral Prosthesis, RB 40
  - CHARNLEY Modular Femoral Prosthesis, RB Narrow 40
  - CHARNLEY Modular Femoral Prosthesis, RB 45
  - CHARNLEY Modular Femoral Prosthesis, RB 45
  - CHARNLEY Modular Femoral Prosthesis, Flanged 45
  - CHARNLEY Modular Femoral Prosthesis, Flanged 45

- **CHARNLEY Modular Femoral Prosthesis, Ex H 45**
### Femoral Trials

**CHARNLEY Modular Trial Femoral Prosthesis**
- 963035000  CHARNLEY Modular Trial Femoral Prosthesis, CDH
- 963035002  CHARNLEY Modular Trial Femoral Prosthesis, SNS 35
- 963035001  CHARNLEY Modular Trial Femoral Prosthesis, Flange 35
- 963031000  CHARNLEY Modular Trial Femoral Prosthesis, RB 40
- 963034000  CHARNLEY Modular Trial Femoral Prosthesis, RB Narrow 40
- 963033000  CHARNLEY Modular Trial Femoral Prosthesis, RB 45
- 963040001  CHARNLEY Modular Trial Femoral Prosthesis, Ex H 40
- 963030000  CHARNLEY Modular Trial Femoral Prosthesis, Flange 45
- 963045001  CHARNLEY Modular Trial Femoral Prosthesis, Ex H 45

### Acetabular Cups

- 965122038  CHARNLEY LPW Cup 22.225/38 mm
- 965122040  CHARNLEY LPW Cup 22.225/40 mm
- 965122043  CHARNLEY LPW Cup 22.225/43 mm
- 965122047  CHARNLEY LPW Cup 22.225/47 mm
- 965122050  CHARNLEY LPW Cup 22.225/50 mm
- 965122053  CHARNLEY LPW Cup 22.225/53 mm

### Centralisers

- 960092000  CHARNLEY Size 1 Centraliser (Pmma)
- 960093000  CHARNLEY Size 2 Centraliser (Pmma)

### Cement Restrictors (Polyethylene)

- 546010000  Cement Restrictor Size 1
- 546012000  Cement Restrictor Size 2
- 546014000  Cement Restrictor Size 3
- 546016000  Cement Restrictor Size 4
- 546018000  Cement Restrictor Size 5
- 546020000  Cement Restrictor Size 6
- 546022000  Cement Restrictor Size 7
- 546024000  Cement Restrictor Inserter

### Cement Restrictor Trials

- 546030000  Cement Restrictor Trial 1
- 546032000  Cement Restrictor Trial 2
- 546034000  Cement Restrictor Trial 3
- 546036000  Cement Restrictor Trial 4
- 546038000  Cement Restrictor Trial 5
- 546040000  Cement Restrictor Trial 6
- 546042000  Cement Restrictor Trial 7

### Instruments

- 962040000  CHARNLEY Neck Osteotomy Guide
- 252200506  ELITE In-line Broach Handle
- 962901000  EXCEL Broach Rb40
- 962902000  EXCEL Broach Rb40
- 962903000  EXCEL Broach R40
- 962582000  EXCEL Broach R45
- 962583000  EXCEL Broach R45
- 962913000  EXCEL Broach Cdh
- 962045000  CHARNLEY Curette Small
- 962046000  CHARNLEY Curette Medium
- 962047000  CHARNLEY Curette Large
- 200142000  EXCEL T Handle
- 200118501  IM initiator
- 235410000  Muller Awl Reamer With Hudson End
- 210512000  Canal Reamer 10
- 210514000  Canal Reamer 11
- 210515000  Canal Reamer 12
- 210516000  Canal Reamer 13
- 200250000  Anteversion Osteotome Medium
- 200165000  EXCEL Femoral Head Impactor
- 252200502  ELITE PLUS Stem Introducer

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DePuy Synthes

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