FINAL ASSEMBLY OF IMPLANT

Place the femoral head onto the taper and lock it with a twisting motion. Using the femoral head driver, secure the femoral head onto the stem with one firm blow. Use a similar technique to lock the unipolar head and adaptor onto the taper. Place the adaptor and unipolar head onto the taper and lock them onto the taper with a twisting motion.

Note: Impacting the stem driver while inserting the implant with an assembled head may cause the femoral head to loosen. Test the security of the head fixation by trying to remove the head by hand once the implant is seated. One sharp strike using the femoral head impactor and mallet should be used to ensure the femoral head is seated on the taper.
PREOPERATIVE TEMPLATING

Use preoperative templating (Fig. 1) to determine: a) the anticipated stem size, b) the height and angle of the femoral neck osteotomy, c) the relationship of the lateral border of the prosthesis to the trochanteric bed, d) the relationship of the medial aspect of the femoral collar to the calcar, and e) the center of rotation of the prosthetic head as it aligns with the tip of the greater trochanter. This preoperative information will help achieve the most accurate implantation and joint reconstruction.

Examination of the rasp/implant relationships reveals that the Cemented LD/Fx implants are smaller than the corresponding rasp. This allows space for the cement mantle. A summary of the cement mantle thickness is provided in the Cement Mantle Chart (Table 1). Stems with a hyphenated size designation can be used with two different rasps depending on the size of the femur and/or the desired cement mantle thickness. For instance, a size 14-15 implant can be used with the 14 or 15 rasp. The size 14 rasp produces a minimum cement mantle thickness of 1.0mm and the 15 rasp produces a 1.5mm minimum cement mantle. A template is provided for each possible rasp option in the Cemented LD/Fx system.

Examination of the Press-Fit LD/Fx templates reveals that these stems have been sized to achieve a tight, intimate contact with the rasped canal. Over the distal half of the implant, the stem is sized to have a 0mm press-fit (or line-to-line relationship) with the rasped canal. The body portion of the implant has a tapering press-fit that is 0mm at the midstem transition and progresses to 0.4mm at the osteotomy level.

### Cement Mantle Chart

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</tr>
</thead>
<tbody>
<tr>
<td>(12-13)</td>
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Table 1

IMPLANT INSERTION (PRESS-FIT AXONY)

Press the implant down the canal by hand until it stops advancing, usually 2 to 3cm above the neck osteotomy. Assemble the stem impactor in the slot provided on the implant (Fig. 10). Tap the impactor until the collar of the implant is seated on the calcar or the implant stops advancing. A press-fit relationship between the proximal implant surfaces and the rasp exists. As a result, the insertion resistance of the implant may increase as the stem is advanced down the canal.

NECK LENGTH CONSTRUCTION WITH UNIPOLAR HEADS

Four neck lengths can be achieved with each unipolar head diameter. The shortest neck length option is achieved by attaching the head directly onto the stem taper. Longer neck lengths (+7mm, +10.5mm, and +14mm) can be achieved by attaching the corresponding adaptor onto the stem taper, then placing the head on the adaptor*. The adaptors are designed not to attach to the standard femoral heads.

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* U.S. Patent 5,156,624
+ U.S. Patent 5,089,003
LEG LENGTH MEASUREMENT

Leg length must be measured during the surgery to help assure that inappropriate lengthening or shortening does not occur. To fix the leg length caliper rigidly, insert it into the pelvic wing posterior to the anterior-superior iliac spine, then place a reference point on the greater trochanter or on the shaft of the femur. Make the initial measurement with the leg in an immobilized reproducible position.

FEMORAL NECK OSTEOTOMY

Place the osteotomy guide over the exposed proximal femur (Fig. 2). The center hole marked “LD” (low demand/fracture) should be aligned with the center of rotation of the femoral head. Perform the osteotomy using one or more of the following anatomical references: a) the relationship of the tip of the greater trochanter to the center of the femoral head, b) the top of the femoral head, and c) the distance above the lesser trochanter.

OPENING THE FEMORAL CANAL

Using the box osteotome, excise bone laterally from the greater trochanter to facilitate neutral placement of the stem without impinging or damaging abductor musculature. A trochanteric router or Charnley awl may then be used to assist in gaining straight access down the femoral canal (Figs. 3 and 3a).

CANAL PREPARATION AND CEMENT TECHNIQUE (CEMENTED LD/FX ONLY)

Using state-of-the-art cementing technique, clean the femoral canal with pulsatile lavage and drying. Measure the distal diameter of the canal with the intramedullary sizers to determine size of the intramedullary plug and distal centralizer. After reducing bone cement porosity, inject bone cement into canal in retrograde fashion with subsequent cement pressurization technique (Fig. 8).

IMPLANT INSERTION (CEMENTED LD/FX ONLY)

Push the femoral stem down the canal (Fig. 9). Insertion control may be enhanced by using the stem impactor to guide the stem. Moderate resistance confirms good pressurization. Care should be taken to remove all residual cement. Maintain implant position until cement is completely polymerized.

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TRIAL REDUCTION

Assemble the appropriate size cone provisional onto the rasp trunnion.

The head/neck trials include five different neck lengths for the femoral head sizes and four neck length options with the unipolar heads (Fig. 6). Observe the relationship of the center of the femoral head to the top of the greater trochanter with each head/neck trial to confirm the preoperative plan. Note the sciatic nerve tension, range of motion, and confirm the positions of potential instability.

FEMORAL RASPING

Start with a rasp one or two sizes smaller than the size selected during templating. Note: The rasp alignment tip used for the VerSys porous prostheses should not be assembled with the rasp. The insertion of the femoral rasp should provide for anteversion by rotating the rasp to re-create the patient’s normal anteversion, except in cases of excessive anteversion (Fig. 4).

The rasp must advance with each blow of the mallet. Stop rasping if there is no evidence of advancement. Continuing to impact the rasp handle when the rasp is not advancing with each stroke runs a high risk of fracturing the femur. If the rasp countersinks 5mm, then proceed to the next size. If the rasp countersinks only 2 to 3mm, this will be the final size.

CALCIR PREPARATION

After removing the rasp handle, place the calcar planer over the rasp trunnion. The planer should be powered prior to engaging the calcar and gently eased onto the calcar to avoid fractures. Machine the calcar to achieve intimate collar/calcar contact (Fig. 5).

CALCIR SIZING FOR DISTAL CENTRALIZATION (CEMENTED LD/FX ONLY)

The distal centralizer size should be chosen by measuring the canal with the intramedullary sizers. This measurement must be taken at a depth that represents the final resting position of the centralizer.

This will provide for optimal centralization of the distal stem. An alternate method is to refer to the recommended centralizer size in the Cement Mantle Chart (Table 1, Page 2). The centralizer size recommended in the chart is 2mm smaller than the rasp. This centralizer will maintain the mantle thickness indicated in the chart; however, it does not necessarily centralize the distal stem. Failure to properly measure the distal canal may prohibit the stem from fully seating.

For press-fit technique, skip to implant insertion on page 7.

When attaching the centralizer, the flat side of the centralizer is directed toward the stem tip. The tip should be introduced through the opening on the flat side of the centralizer (Fig. 7). The centralizer is advanced on the stem tip with a minimum force until it comes to rest in its final position. The centralizer does not need to be twisted or forced on the stem. Improper assembly of the distal centralizer may prohibit the stem from fully seating.

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FOR PRESSED LD/FX TECHNIQUE SKIP TO IMPLANT INSERTION ON PAGE 7.

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Choose a distal centralizer of appropriate size. The distal centralizer’s inner diameter has a taper through its length similar to the head/neck taper. Before attaching the distal centralizer to the stem, apply a thin layer of cement to the distal tip or fill the tapered hole in the centralizer with cement. This will help promote a good bond between the stem and distal centralizer.

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+ U.S. Patent 5,089,033
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Please refer to the package insert for complete product information, including contraindications, warnings and precautionary information.
U.S. Patent 5,089,003
U.S. Patent 5,156,624