# Profemur® Renaissance®

## Hip System: Classic and Modular Stems

Surgical Technique

MicroPort Orthopedics

Full Function, Faster®

# Table of Contents



MicroPort Orthopedics recognizes that proper surgical procedures and techniques are the responsibility of the medical professional. The following guidelines are furnished for information purposes only. Each surgeon must evaluate the appropriateness of the procedures based on his or her personal medical training, experience and patient condition. Prior to use of the system, the surgeon should refer to the product package insert for additional warnings, precautions, indications, contraindications and adverse effects. Instructions For Use package inserts are also available by contacting the manufacturer. Contact information can be found on the back of this Surgical Technique and the Instructions For Use package inserts are available on the website listed.

# Chapter 1

## Design Rationale

The Profemur® Renaissance® Hip System is a "ream and broach" stem design that provides immediate stability through fixation of the diaphyseal canal. Reamers prepare the canal diameter to size, and press-fit distal splines provide rotational stability once the stem is implanted. The stem has two medial flare options designed to optimize fit, stability, and load transfer based on the patient anatomy: "standard flare" for femurs with moderate cortical wall thickness, and "reduced flare" for femurs with thick cortical walls ("champagne flute" canals). Secondary fixation is achieved via titanium plasma spray coating to promote bone ingrowth.

The Profemur® Renaissance Hip system has 16 stem sizes to optimize fit for each patient anatomy. Replicating leg length and neck offset is achieved in the Profemur® Renaissance® Classic stem with a combination of short/long and straight/varus necks. For unique patient anatomies requiring even more reconstruction options, the Profemur® Renaissance® Modular stem has 11 neck options of varying lengths and versions. Not only does this modular system optimize stability, range of motion, and leg length, but it also allows for intraoperative versatility to address soft tissue tension as needed[1].

[1] Traina F, De Clerico M, Biondi F, Pilla F, Tassinari E, Toni A. Sex differences in hip morphology: is stem modularity effective for total hip replacement?; J Bone Joint Surg Am 2009 Nov; 91(6):121-8.

# Chapter 2

## Product Information

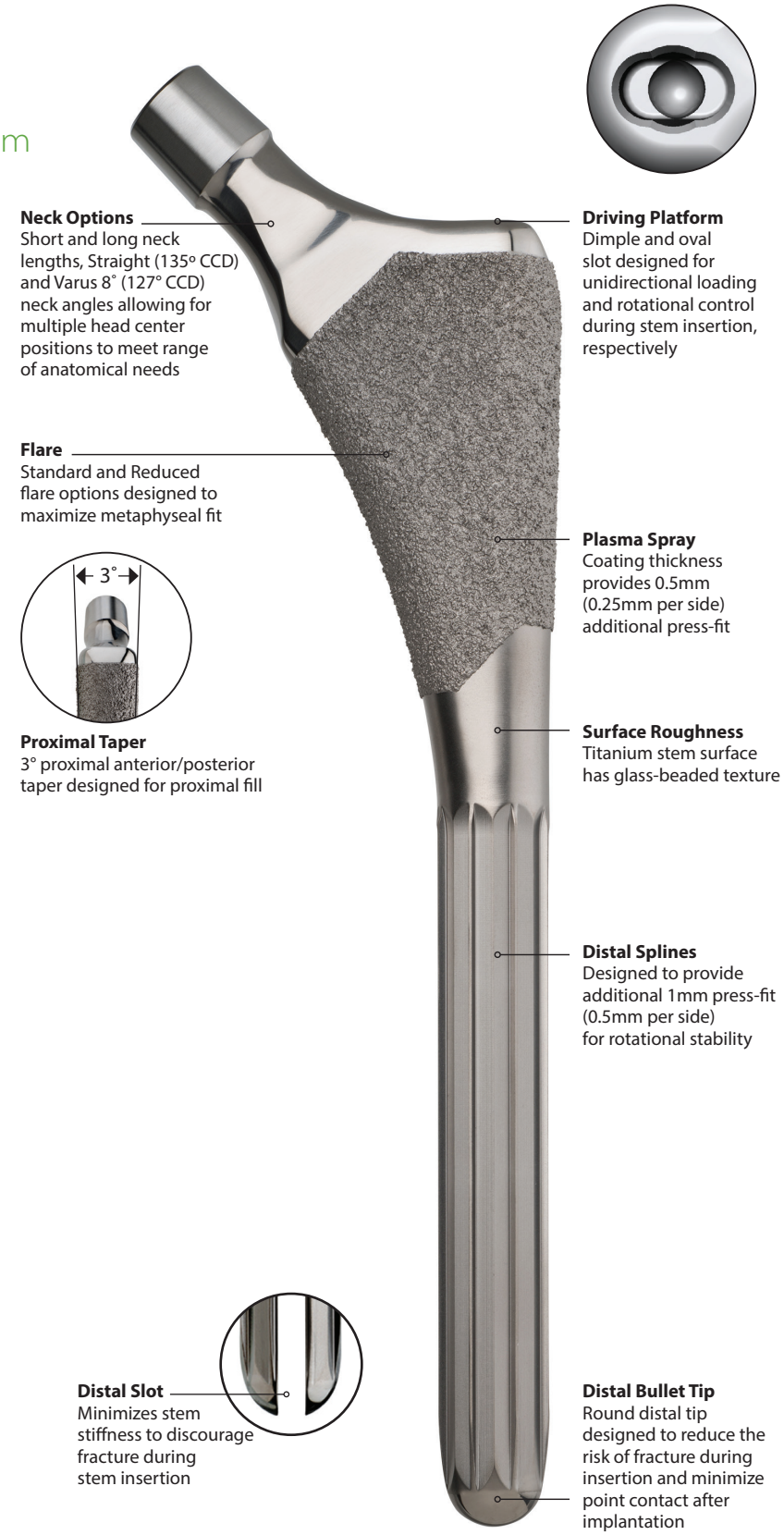
### Profemur® Renaissance® Classic Stem Design Features

| Abbreviated Technique: Ream and Broach |
|---|
| Ream to templated size or cortical chatter |
| Sequentially broach with reduced flare broaches to corresponding reamer size |
| If it is not secure, switch to standard flare broach or ream and broach to larger stem size |
| Implant size and flare corresponding to broach size and flare |

| Ordering Information | |
|---|---|
| Templates | PRNCXR15 (Short Neck Classic)<br>PRNLXR15 (Long Neck Classic) |
| Surgical Technique | 008118 |
| Instruments | PRGIKIT1 (Includes trial necks)<br>PRZNKIT1 (Broaches and broach handles)<br>PRZNKIT2 (Reamers)<br>PRCLIMPT (Classic stem impactor) |
| Implants | PRRCKITS (Short neck stems)<br>PRRCKITL (Long neck stems) |

| Sizes | |
|---|---|
| Neck | Short and Long |
| Reduced Flare | 10 - 16 |
| Standard Flare | 10 - 18 |

*For additional risk information, please consult the Instructions for Use package insert.*

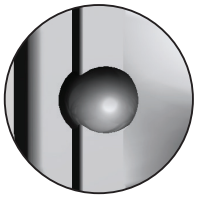


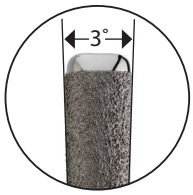
# Profemur® Renaissance® Modular Stem Design Features

| Abbreviated Technique: Ream and Broach |
|---|
| Ream to templated size or cortical chatter |
| Sequentially broach with reduced flare broaches to corresponding reamer size |
| If it is not secure, switch to standard flare broach or ream and broach to larger stem size |
| Implant size and flare corresponding to broach size and flare |

| Ordering Information | |
|---|---|
| Templates | PLS0XR15 |
| Surgical Technique | 008118 |
| Instruments | PRGIKIT1 (Includes trial necks)<br>PRZNKIT1 (Broaches and broach handles)<br>PRZNKIT2 (Reamers) |
| Implants | PLIMKITA (Stems)<br>COCRKITB (Modular necks) |
| **Sizes** | |
| Reduced Flare | 10 - 16 |
| Standard Flare | 10 - 18 |

*For additional risk information, please consult the Instructions for Use package insert.*






**Driving Platform**
Threaded slot designed for rotational control during stem insertion

**Proximal Taper**
3° proximal anterior/posterior taper designed for proximal fill

**Plasma Spray**
Coating thickness provides 0.5mm (0.25mm per side) additional press-fit

**Flare**
Standard and Reduced flare options designed to maximize metaphyseal fit

**Surface Roughness**
Titanium stem surface has glass-beaded texture

**Distal Splines**
Designed to provide additional 1mm press-fit (0.5mm per side) for rotational stability



**Distal Slot**
Minimizes stem stiffness to discourage fracture during stem insertion

**Distal Bullet Tip**
Round distal tip designed to reduce the risk of fracture during insertion and minimize point contact after implantation

# Profemur® Modular Necks Design Features

- Cobalt Chrome Material
- Varus Neck Angle: 127°
- Neutral Neck Angle: 135°
- Valgus Neck Angle: 143°

4°/8°/15° Anteversion or Retroversion

6°/8° Varus or Valgus

**Dimensional Chart (mm)**

| Type | Length Options |
|---|---|
| **Neutral** | Short<br>Long |
| **Varus/Valgus** | Short |
| **Ante/Retro 8 Degree** | Short<br>Long |
| **Ante/Retro 15 Degree** | Short<br>Long |
| **Ante/Retro - Varus/Valgus 1** | Short<br>Long |
| **Ante/Retro - Varus/Valgus 2** | Short<br>Long |

# Profemur® Renaissance® Stems - General Specifications

General Specifications

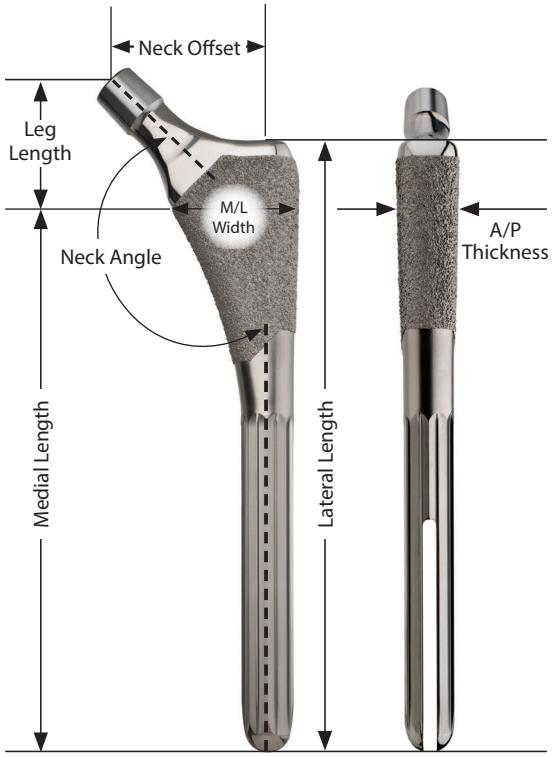
- Stems are made of titanium alloy
- Commercially-pure titanium plasma spray over proximal region (0.5mm/side)
- Medial Stem Length: 125 - 170mm
- M/L Width: 27 – 40mm
- Distal splines are 1mm larger than matching reamer
- A/P Thickness: 14 – 17mm

**Profemur® Renaissance® Hip Stems Dimensional Chart**

(Measurements in millimeters)

| | | Short Neck Classic and Modular | | Long Neck Classic and Modular | | Stem Measurements | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Size | Leg Length | Neck Offset | Leg Length | Neck Offset | Med. Length | M/L Width | A/P Thick. | Lat. Length |
| | **Straight (Neck Angle = 135°)** | | | | | | | | |
| Reduced | 10 | 31 | 33 | 38 | 41 | 125 | 28 | 14 | 145 |
| | 11 | 31 | 35 | 38 | 42 | 129 | 28 | 15 | 148 |
| | 12 | 31 | 36 | 39 | 44 | 134 | 30 | 16 | 154 |
| | 13 | 32 | 37 | 40 | 45 | 140 | 31 | 17 | 158 |
| | 14 | 32 | 37 | 40 | 45 | 145 | 32 | 18 | 163 |
| | 15 | 33 | 39 | 41 | 47 | 150 | 33 | 19 | 170 |
| | 16 | 33 | 39 | 41 | 47 | 154 | 34 | 21 | 175 |
| Standard | 10 | 31 | 33 | 38 | 41 | 125 | 30 | 14 | 145 |
| | 11 | 31 | 35 | 38 | 42 | 129 | 30 | 15 | 148 |
| | 12 | 31 | 36 | 39 | 44 | 134 | 32 | 16 | 154 |
| | 13 | 32 | 37 | 40 | 45 | 140 | 33 | 17 | 158 |
| | 14 | 32 | 37 | 40 | 45 | 145 | 34 | 18 | 163 |
| | 15 | 33 | 39 | 41 | 47 | 150 | 35 | 19 | 170 |
| | 16 | 33 | 39 | 41 | 47 | 154 | 36 | 21 | 175 |
| | 17 | 33 | 41 | 40 | 49 | 160 | 37 | 22 | 180 |
| | 18 | 33 | 42 | 40 | 49 | 170 | 38 | 23 | 190 |
| | **Varus 8° (Neck Angle = 127°)** | | | | | | | | |
| Reduced | 10 | 29 | 36 | 35 | 45 | 125 | 28 | 14 | 145 |
| | 11 | 27 | 38 | 35 | 46 | 129 | 28 | 15 | 148 |
| | 12 | 28 | 40 | 36 | 48 | 134 | 30 | 16 | 154 |
| | 13 | 28 | 41 | 37 | 49 | 140 | 31 | 17 | 158 |
| | 14 | 28 | 41 | 37 | 49 | 145 | 32 | 18 | 163 |
| | 15 | 30 | 43 | 38 | 51 | 150 | 33 | 19 | 170 |
| | 16 | 30 | 43 | 38 | 51 | 154 | 34 | 21 | 175 |
| Standard | 10 | 29 | 36 | 35 | 45 | 125 | 30 | 14 | 145 |
| | 11 | 27 | 38 | 35 | 46 | 129 | 30 | 15 | 148 |
| | 12 | 28 | 40 | 36 | 48 | 134 | 32 | 16 | 154 |
| | 13 | 28 | 41 | 37 | 49 | 140 | 33 | 17 | 158 |
| | 14 | 28 | 41 | 37 | 49 | 145 | 34 | 18 | 163 |
| | 15 | 30 | 43 | 38 | 51 | 150 | 35 | 19 | 170 |
| | 16 | 30 | 43 | 38 | 51 | 155 | 36 | 21 | 175 |
| | 17 | 29 | 45 | 37 | 53 | 160 | 37 | 22 | 180 |
| | 18 | 30 | 46 | 37 | 53 | 170 | 38 | 23 | 190 |

Offset and Leg Length are based on +0 head.



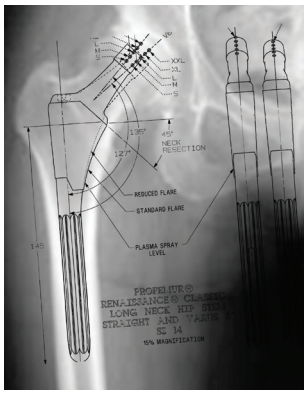

**Head Center Adjustment Chart**

(Measurements in millimeters)

| | | OFFSET / LEG LENGTH ADJUSTMENT | |
|---|---|---|---|
| **Head Size** | **Neck Length Adjustment** | **Straight** | **Varus 8°** |
| Short | -3.5 | -2.5 / -2.5 | -2.8 / -2.1 |
| Medium | +0 | +0.0 / +0.0 | +0.0 / +0.0 |
| Long | +3.5 | +2.5 / +2.5 | +2.8 / +2.1 |
| X Long | +7 | +4.9 / +4.9 | +5.6 / +4.2 |
| XX Long | +10.5 | +7.4 / +7.4 | +8.4 / +6.3 |

# Chapter 3

## Preoperative Planning




***CAUTION:*** *Preoperative templating is intended for estimation purposes only. Final component size and position should be determined intraoperatively.*

Accurate preoperative templating requires good quality standardized radiographs of the pelvis and operative hip. To determine limb length discrepancy, draw a line across the bottom of the ischium on the A/P view. The distance from this horizontal reference line to each lesser trochanter should then be measured. The difference between each measured side is the leg length discrepancy. If there is any asymmetry of the pelvis or if landmarks are not clear, other means to determine discrepancy should be used.

Determine the femoral head center. Once the center of rotation for the acetabular component has been established, the center of rotation for the femoral head should be determined. Superimpose the femoral stem templates sequentially on the A/P x-ray with the templates positioned neutrally along the longitudinal axis of the femur. Estimate the metaphyseal and diaphyseal fit and anticipated level of implant insertion using the templates. The approximate femoral size and length of the femoral neck cut can be estimated from the templates.

The neck angle and head length which most closely correspond to the patient's femoral head center can be estimated as well. The ideal head will align atop the previously determined center of rotation for the femoral head. In patients with significant deformity of the femoral head, templating can be performed on the opposite hip if necessary.

For soft bone, the implant may seat further than the template indicates. An implant larger than the templated size may be required. For strong, healthy bone, an implant smaller than the templated size may be required.

Each circle represents the center of rotation for a modular short neck with the corresponding head option (Short to XX Long). Each square represents the center of rotation for a modular long neck with the corresponding head option (Short to XX Long). The circles/squares on the AP template of the stem illustrate the impact of choosing an 8° varus/valgus neck relative to the neutral neck position.

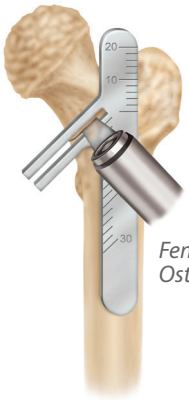
*NOTE: AR/VV necks can also affect neck position by 6˚ varus/valgus.*

The lateral x-ray illustrates the front to back fill of the implant and the position of the implant relative to the femoral anterior bow. If the anterior bow is high, the implant size may be reduced to minimize the risk of fracture. The lateral templates use circles/squares to compare the impact of choosing a neutral neck and necks with 8° or 15° anteversion/retroversion.

Both the A/P and lateral views are needed to illustrate the impact of choosing an AR/VV neck because the combination necks provide multi-dimensional positioning. Each AR/VV neck provides 4° anteversion/retroversion and 6° varus/valgus. The impact of each AR/VV option (1 or 2) depends upon which hip is being considered. Therefore, caution should be used to ensure that the appropriate combination is planned.

# Chapter 4

## Surgical Technique



*Femoral Neck Osteotomy*


*Open the Femoral Canal*

*Reaming depth is measured from medial resection.*

### Femoral Neck Osteotomy

Using the greater trochanter or lesser trochanter as a reference, resect the neck at a 45° angle to the longitudinal axis of the femur. The Profemur® Neck Resection Guide (P/N PTRG0410) is available to help establish the angle of resection.

### Open the Femoral Canal

Using the Profemur® Box Chisel (P/N PRFS0450), open the femoral canal. The box chisel should be lateralized to ensure a neutral orientation of the implant.

### Starter Reamer

Enter the femoral canal with the Profemur® Initial Reamer (P/N APA04750). Proper reaming depth, measured from the medial resection, corresponds to stem length. Using the Profemur® Renaissance® Proximal Reamer (P/N PSSR1118), clear out the lateral greater trochanter to allow straight access to the femoral canal.

It is important to stay lateral with the box chisel, starter reamer, and proximal reamer. Care should be taken to ensure that the initial reaming track into the femur is in neutral alignment with the femoral axis.

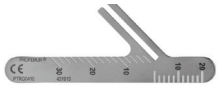
### Femoral Reaming

Starting with the smallest reamer, Profemur® Femoral Reamer Size 8 (P/N PRR00080), sequentially ream the femoral canal to the appropriate depth and diameter based on the templated size and the amount of resistance that the reamer encounters.

Stem length is measured from the upper most plasma line on the medial side (resection line) to the distal tip of the implant. Proper reaming depth, measured off of the medial resection, corresponds to stem length.

### Profemur® Renaissance® Reaming Chart

| Stem Size | Reaming Depth |
|---|---|
| 10 | 125mm |
| 11 | 130mm |
| 12 | 135mm |
| 13 | 140mm |
| 14 | 145mm |
| 15 | 150mm |
| 16 | 155mm |
| 17-18 | 160mm |



*Profemur® Neck Resection Guide (P/N PTRG0410)*


*Profemur® Box Chisel P/N PRFS0450*


*Profemur® Initial Reamer P/N APA04750*


*Profemur® Renaissance® Proximal Reamer P/N PSSR1118*


*Profemur® Renaissance® Reamer Size 8 P/N PRR00080*

## Femoral Broaching

Prepare the femoral canal with the Profemur® Renaissance® Starter Broach (P/N PLRB0009). Staying centered between the anterior and posterior cortices, impact the starter broach until the top of the teeth rests just at or below the level of the neck resection. Insert the broach until it rests 1-2mm below the level of the neck resection.

Attach the broach handle of choice (P/N SLBROHAN is shown) to the smallest reduced flare broach. Begin broaching using a mallet with short, controlled strokes. Sequentially broach to the appropriate size, using the reduced flare Profemur® Renaissance® Broaches (P/N PLRB0010-18).

The correct broach depth is achieved when the base of the polished oval collar rests along the resection. Recognize that the polished collar increases in height as stem size increases. Throughout broaching, continue to apply lateral pressure to ensure neutral alignment of the implant.

Continue broaching until an optimal fit is found. Once the appropriately sized broach is fully seated, leave the broach fully seated in the canal and detach the broach handle to allow for trial reduction.

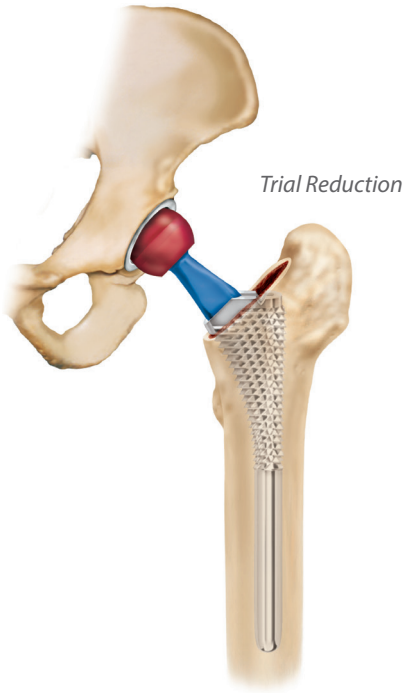
***CAUTION:*** *The Profemur® Renaissance® hip system includes both standard and reduced flare broaches and implants. Broaching is performed sequentially, using the reduced flare broaches, to the equivalent reamer size used during the femoral reaming process. If the fit is not secure, sequentially broach to the equivalent reamer size using the standard flare Profemur® Renaissance® Broaches (P/Ns PLSB0010-18).*

*NOTE: The femoral broaches are 0.5mm smaller than the plasma spray of the implant, providing 0.5mm (0.25mm per side) of press-fit proximally.*

*Profemur® Renaissance® Starter Broach*
*P/N PLRB0009*

*Profemur® Renaissance® Broach*
*P/N PLRB0010-18*

*Profemur® Slotted Broach Handle*
*P/N SLBROHAN*



*Trial Reduction*

## Potential Differences Between Broached and Templated Sizes:

1. The quality of bone plays an integral role in sizing. For soft bone, the broach may seat further than the template indicates. An implant larger than the templated size may be required. Patients with strong, healthy bone might require an implant smaller than the templated size.

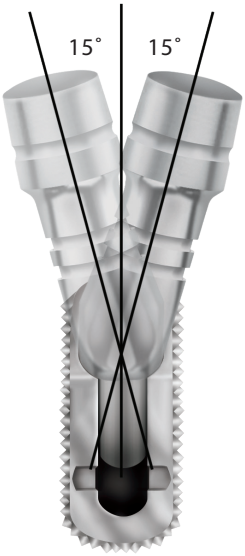
2. If a broach smaller than the size templated becomes tight, hard bone at the lateral femoral neck may be pushing the broach into varus. Use the lateral edge of the broach to restore a neutral position. Additional broaching may be necessary.

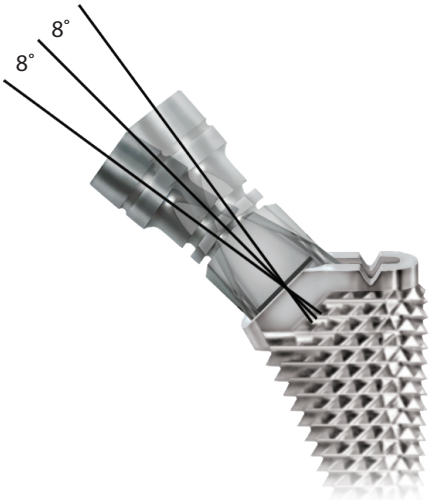
3. If a broach is going in straight and still becomes tight with sizes smaller than templated, a repetitive in/out broach motion may clear excess medial and lateral bone. If still tight, the stem should be appropriately downsized until metaphyseal bone is engaged.

## Trial Reduction

Select the appropriate plastic or metal Profemur® Trial Neck (P/Ns APA11102 - APA11154 or APA12102 - APA12154) and either the Profemur® Trial Head (P/Ns APA02121 - APA02154) or the Trial Head/Neck Sleeve combination (P/Ns 41103600 - 41104800 and P/Ns APA0TSS3, APA0TSM0, APA0TSL3 or APA0TSX7) and perform a trial reduction. Metal Profemur® Trial Necks (P/Ns APA12102 - APA12154) are equivalent dimensionally to the plastic Profemur® Trial Necks. Once a well balanced hip has been created with a trial head and trial neck, remove the broach.

For Classic stems, use only the short and long, straight and varus plastic and metal Profemur® Trial Necks (P/Ns APA11102, APA11104, APA11152, APA11154 or APA12102, APA12104, APA12152, APA12154) as they represent the Profemur® Renaissance® Classic stem offerings.


## Summary of Profemur® Renaissance® Modular Neck Angle Options

The choice of neck anteversion is based on intraoperative assessment of stability. The head/neck combination that allows maximal flexion/internal rotation and extension/external rotation without dislocation should be chosen.

»» Straight necks create a neutral neck axis.

»» Varus necks decrease the inclination angle to 127° (neutral position is 135°); the femoral head shifts medially and inferiorly; leg length is shortened; offset is increased.

»» Valgus necks increase the inclination angle to 143°; the femoral head shifts laterally and superiorly; leg length is increased; offset is decreased.

»» Anteverted necks shift the femoral head anteriorly relative to the stem by 8° or 15°.

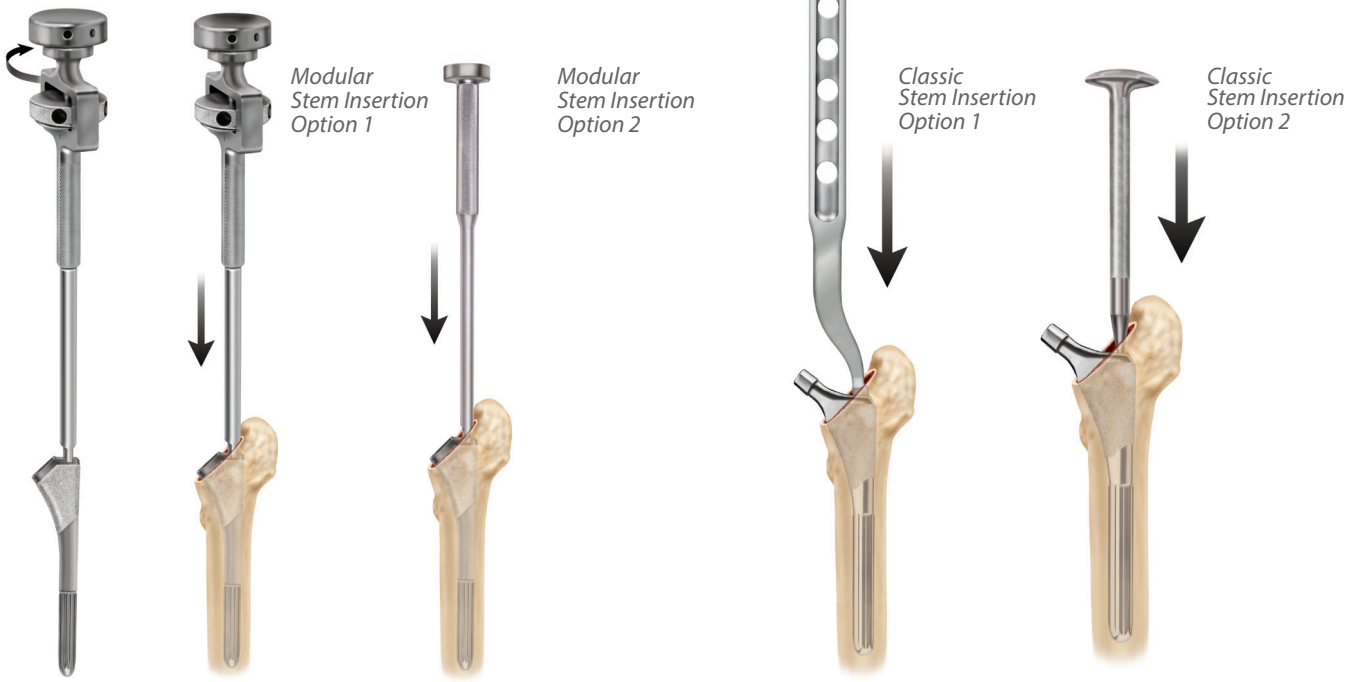
»» Retroverted necks shift the femoral head posteriorly relative to the stem by 8° or 15°. Retroverted necks prove useful in hips with excess femoral anteversion such as DDH.

»» AR/VV necks combine anteversion/retroversion and varus/valgus necks to offer a broad range of multi-dimensional head positions. Each AR/VV neck provides 4° of A/R and 6° of V/V.

## Summary of Profemur® Renaissance® Classic Neck Angle Options

»» Straight (135°) necks create a neutral neck axis.

»» Varus 8° necks decrease the inclination angle to 127°; the femoral head shifts medially and inferiorly; leg length is shortened; offset is increased.




## Stem Insertion

### Modular Stem Option 1

Connect the Profemur® Threaded Inline Stem Inserter (P/N PRFS1461) into the small threaded hole on the proximal face of the femoral implant, and insert the stem into the femoral canal with hand pressure to align proper version. Use a mallet with short, controlled strokes to seat the implant. Typically, the final implant is seated with the base of the polished collar aligned with the neck resection.

### Modular Stem Option 2

Insert the femoral implant into the femoral canal and align the version before placing the Profemur® Screwdriver Inserter (P/N PRFS0460) into the impaction slot on the proximal face. Use a mallet with short, controlled strokes to seat the implant. Typically, the final implant is seated with the base of the polished collar aligned with the neck resection.

### Classic Stem Option 1

The Profemur® Classic Stem Inserter (P/N PRCLIMPT) is available to provide rotational control during impaction.

Place the tip of this impactor into the oval slot on the proximal face and, with a mallet, fully seat the implant using short, controlled strokes. Typically, the final implant is seated with the base of the polished collar aligned with the neck resection.

### Classic Stem Option 2

Place the tip of the Final Stem Impactor (P/N PPF60200) into the dimple on the proximal face and, with a mallet, fully seat the implant using short, controlled strokes. Typically, the final implant is seated with the base of the polished collar aligned with the neck resection.

## Final Trial Reduction

Perform a final trial reduction using the plastic necks and trial heads to reconfirm stability, range of motion and leg length.

***CAUTION:*** *Do not use metal trial necks with the implant. Metal trial necks are only to be used with broaches since they may damage the taper. Only plastic trial necks (available in PRGIKIT1) should be used for trial reductions with the implant.*

*Profemur® Threaded Inline Stem Inserter*
*P/N PRFS1461*

*Profemur® Screwdriver Inserter*
*P/N PRFS0460*

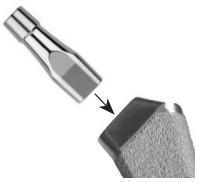
*Profemur® Classic Stem Inserter*
*P/N PRCLIMPT*

*Final Stem Impactor*
*P/N PPF60200*

## Implant Assembly

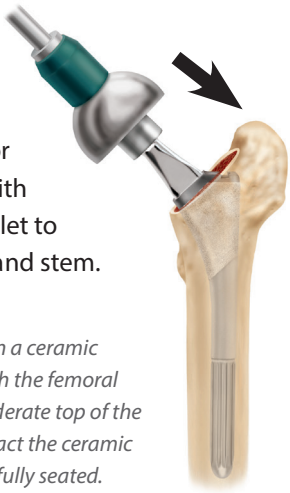
To properly assemble and impact a Profemur® modular neck, the following procedure is recommended:

**STEP A.** Suction any fluid from the stem implant pocket. Ensure that both the stem and neck are clean and dry prior to assembly.



**STEP B.** Insert the oval end of the appropriate femoral neck implant into the femoral stem pocket.

**STEP C.** Position the leg such that the knee is supported by an assistant on the opposite side of the table. By resting the patient's knee against the mid-section of the assistant, this will provide counter-force against the mallet blows to ensure the impaction load transfer to the neck junction.



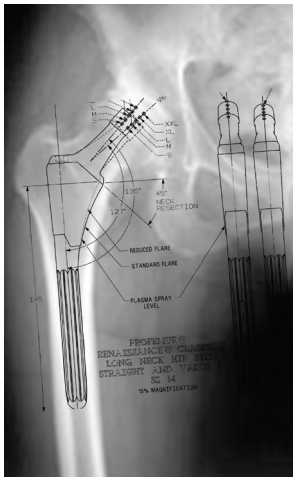
**STEP D.** Affix the femoral head to the neck. Using the head impactor instrument, strike the impactor with **three very firm blows** with a mallet to securely fix the head to the neck and stem.

*NOTE: Place a femoral head impactor (such as P/N 4400F10000 or PPR67200) on a ceramic femoral head, and align the impactor with the femoral neck axis of the stem implant. With a moderate top of the hammer in the axial direction, firmly impact the ceramic femoral head on the stem taper until it is fully seated.*

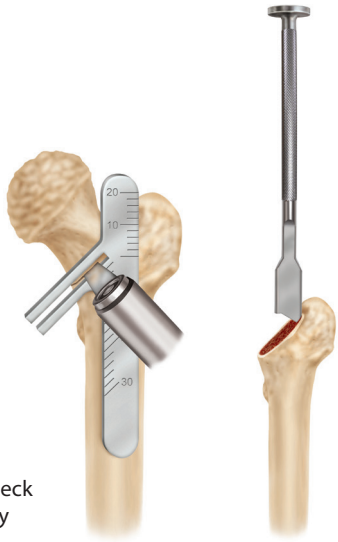
*NOTE: If using a Profemur® Renaissance® Classic stem, affix the femoral head to the stem and impact as instructed.*

# Chapter 5

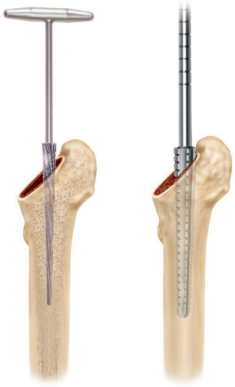
## Technique Overview




**1.** X-ray

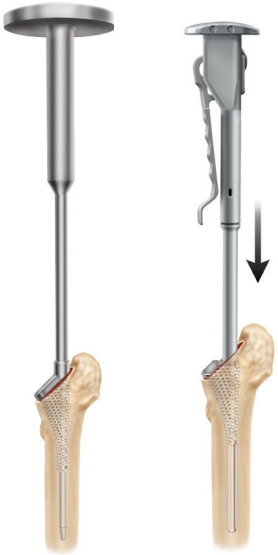


**2.** Femoral Neck Osteotomy

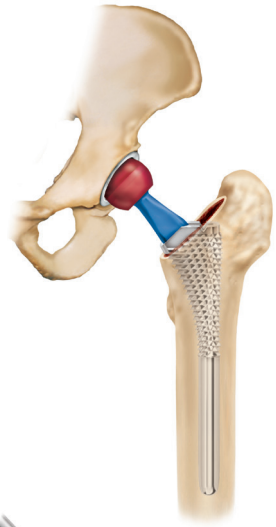


**3.** Femoral Canal Preparation

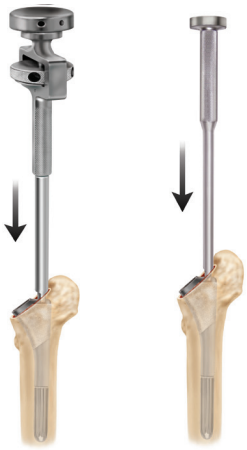
**4.** Femoral Reaming



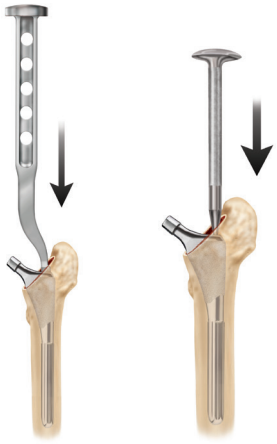
**5.** Femoral Broaching

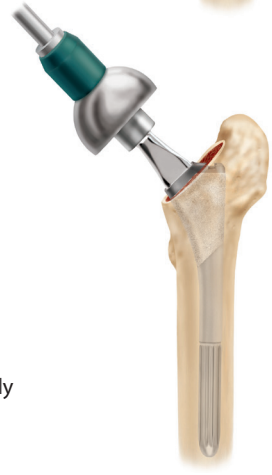


**6.** Trial Reduction



**7.** Stem Insertion





**8.** Implant Assembly

# Chapter 6

## Implant Removal

### Profemur® Renaissance® Classic Stem Removal

*If the removal of the implant is required due to revision or failure of the device, the surgeon should contact the manufacturer using the contact information located on the back cover of this surgical technique to receive instructions for returning the explanted device to the manufacturer for investigation.*

#### Classic Stem Removal

Should the removal of a Profemur® Classic stem become necessary, the Universal Stem Extractor (P/N 4700SE05) and the corresponding Slap Hammer (P/N 4700SH0000) can be utilized. Thread the stem extractor onto the threaded end of the slap hammer. With the femoral head removed, position the stem extractor across the flats on the sides of the femoral neck, and remove the stem using repetitive upward blows delivered by the slap hammer.

*NOTE: Classic stem extraction instruments must be ordered separately.*

*Universal Stem Extractor*
*P/N 4700SE05*

*Slap Hammer*
*P/N 4700SH0000*

# Profemur® Renaissance® Neck and Stem Removal

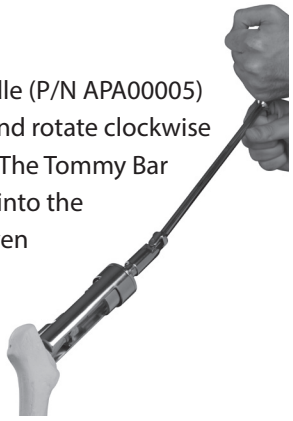
## Modular Neck Removal

Should it be necessary, a Profemur® hip stem can be removed in the following manner.

**STEP A.** The femoral head is removed by placing an osteotome or bone punch on the underside of the femoral head and applying mallet blows upward until the femoral head is removed. With the femoral head removed, thread the 12/14 Adapter (P/N APA00003) over the round taper end of the modular neck.

**STEP B.** Place the Head/Neck Extractor (P/N APA00001) over the 12/14 adaptor and modular neck, and hand tighten the hex end of the shaft until the base of the extractor rests on the stem, while the fork of the extractor rests under the rim of the adaptor.

***CAUTION:*** *The base of the extractor must rest on the top surface of the stem's modular neck pocket, and not on the resected bone.*



**STEP C.** Attach the Spanner Handle (P/N APA00005) to the hex end of the extractor and rotate clockwise until the neck taper disengages. The Tommy Bar (P/N APA00006) can be inserted into the end of the spanner handle for even greater leverage.

Please note that these instruments are designed for the purpose of removing a neck during the primary surgery. These instruments may or may not be able to provide the force necessary to disengage a connection between components that have been implanted for a longer period of time. In revision cases, removal and replacement of only the modular neck is contraindicated.

## Modular Stem Removal

The thread at the base of a Profemur® stem's modular neck pocket can now be accessed to remove the stem. Insert the Femoral Stem Extractor (P/N PPR67688) into the modular neck pocket and tighten the threaded shaft by hand, firmly seating the shaft via the use of the Hex Screwdriver (P/N PP275400). Using the slide hammer, create extraction forces onto the underside of the shaft using repetitive upward blows to remove the stem. If bone on-growth exists, it may be necessary to use osteotomes in order to first disengage the stem/bone interface.

*12/14 Adapter*
*P/N APA00003*

*Head/Neck Extractor*
*P/N APA00001*

*Spanner Handle*
*P/N APA00005*



*Tommy Bar*
*P/N APA00006*

*Hex Screwdriver*
*P/N PP275400*

*Femoral Stem Extractor*
*P/N PPR67688*

# Chapter 6

## Ordering Information

### Profemur® Renaissance® Classic Stems - Short Necks

PRRCKITS

| Catalog No. | Flare | Neck Angle | Size |
|---|---|---|---|
| PLSES010 | Standard | Varus 8˚ | 10 |
| PLSES011 | Standard | Varus 8˚ | 11 |
| PLSES012 | Standard | Varus 8˚ | 12 |
| PLSES013 | Standard | Varus 8˚ | 13 |
| PLSES014 | Standard | Varus 8˚ | 14 |
| PLSES015 | Standard | Varus 8˚ | 15 |
| PLSES016 | Standard | Varus 8˚ | 16 |
| PLSES017 | Standard | Varus 8˚ | 17 |
| PLSES018 | Standard | Varus 8˚ | 18 |
| PLSSS010 | Standard | Straight | 10 |
| PLSSS011 | Standard | Straight | 11 |
| PLSSS012 | Standard | Straight | 12 |
| PLSSS013 | Standard | Straight | 13 |
| PLSSS014 | Standard | Straight | 14 |
| PLSSS015 | Standard | Straight | 15 |
| PLSSS016 | Standard | Straight | 16 |
| PLSSS017 | Standard | Straight | 17 |
| PLSSS018 | Standard | Straight | 18 |
| PLSER010 | Reduced | Varus 8˚ | 10 |
| PLSER011 | Reduced | Varus 8˚ | 11 |
| PLSER012 | Reduced | Varus 8˚ | 12 |
| PLSER013 | Reduced | Varus 8˚ | 13 |
| PLSER014 | Reduced | Varus 8˚ | 14 |
| PLSER015 | Reduced | Varus 8˚ | 15 |
| PLSER016 | Reduced | Varus 8˚ | 16 |
| PLSSR010 | Reduced | Straight | 10 |
| PLSSR011 | Reduced | Straight | 11 |
| PLSSR012 | Reduced | Straight | 12 |
| PLSSR013 | Reduced | Straight | 13 |
| PLSSR014 | Reduced | Straight | 14 |
| PLSSR015 | Reduced | Straight | 15 |
| PLSSR016 | Reduced | Straight | 16 |

### Profemur® Renaissance® Classic Stems - Long Necks

PRRCKITL

| Catalog No. | Flare | Neck Angle | Size |
|---|---|---|---|
| PLLES010 | Standard | Varus 8˚ | 10 |
| PLLES011 | Standard | Varus 8˚ | 11 |
| PLLES012 | Standard | Varus 8˚ | 12 |
| PLLES013 | Standard | Varus 8˚ | 13 |
| PLLES014 | Standard | Varus 8˚ | 14 |
| PLLES015 | Standard | Varus 8˚ | 15 |
| PLLES016 | Standard | Varus 8˚ | 16 |
| PLLES017 | Standard | Varus 8˚ | 17 |
| PLLES018 | Standard | Varus 8˚ | 18 |
| PLLSS010 | Standard | Straight | 10 |
| PLLSS011 | Standard | Straight | 11 |
| PLLSS012 | Standard | Straight | 12 |
| PLLSS013 | Standard | Straight | 13 |
| PLLSS014 | Standard | Straight | 14 |
| PLLSS015 | Standard | Straight | 15 |
| PLLSS016 | Standard | Straight | 16 |
| PLLSS017 | Standard | Straight | 17 |
| PLLSS018 | Standard | Straight | 18 |
| PLLER010 | Reduced | Varus 8˚ | 10 |
| PLLER011 | Reduced | Varus 8˚ | 11 |
| PLLER012 | Reduced | Varus 8˚ | 12 |
| PLLER013 | Reduced | Varus 8˚ | 13 |
| PLLER014 | Reduced | Varus 8˚ | 14 |
| PLLER015 | Reduced | Varus 8˚ | 15 |
| PLLER016 | Reduced | Varus 8˚ | 16 |
| PLLSR010 | Reduced | Straight | 10 |
| PLLSR011 | Reduced | Straight | 11 |
| PLLSR012 | Reduced | Straight | 12 |
| PLLSR013 | Reduced | Straight | 13 |
| PLLSR014 | Reduced | Straight | 14 |
| PLLSR015 | Reduced | Straight | 15 |
| PLLSR016 | Reduced | Straight | 16 |

## Profemur® Renaissance® Stems

PLIMKITA

| Catalog No. | Description |
|---|---|
| PLS0S410 | Profemur® Renaissance® Standard Flare Size 10 |
| PLS0S410 | Profemur® Renaissance® Standard Flare Size 11 |
| PLS0S410 | Profemur® Renaissance® Standard Flare Size 12 |
| PLS0S410 | Profemur® Renaissance® Standard Flare Size 13 |
| PLS0S410 | Profemur® Renaissance® Standard Flare Size 14 |
| PLS0S410 | Profemur® Renaissance® Standard Flare Size 15 |
| PLS0S410 | Profemur® Renaissance® Standard Flare Size 16 |
| PLS0S410 | Profemur® Renaissance® Standard Flare Size 17 |
| PLS0S410 | Profemur® Renaissance® Standard Flare Size 18 |
| PLSSS010 | Profemur® Renaissance® Reduced Flare Size 10 |
| PLSSS011 | Profemur® Renaissance® Reduced Flare Size 11 |
| PLSSS012 | Profemur® Renaissance® Reduced Flare Size 12 |
| PLSSS013 | Profemur® Renaissance® Reduced Flare Size 13 |
| PLSSS014 | Profemur® Renaissance® Reduced Flare Size 14 |
| PLSSS015 | Profemur® Renaissance® Reduced Flare Size 15 |
| PLSSS016 | Profemur® Renaissance® Reduced Flare Size 16 |

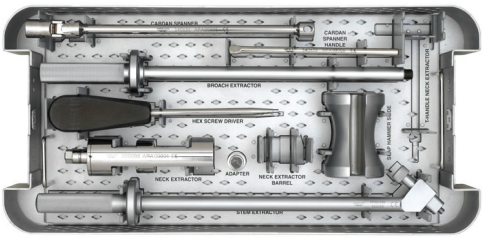
## Profemur® Modular Necks

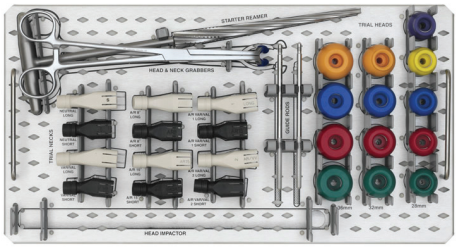
COCRKITB

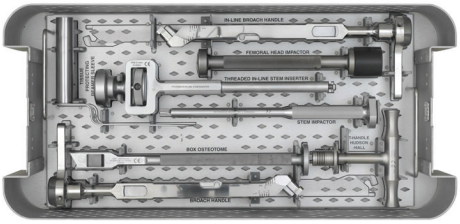
| Catalog No. | Description |
|---|---|
| PHAC1202 | Straight Short CoCr |
| PHAC1204 | Straight Long CoCr |
| PHAC1212 | Ante/Retro - Varus/Valgus 2 Short CoCr |
| PHAC1214 | Ante/Retro - Varus/Valgus 2 Long CoCr |
| PHAC1222 | Ante/Retro - Varus/Valgus 1 Short CoCr |
| PHAC1224 | Ante/Retro - Varus/Valgus 1 Long CoCr |
| PHAC1232 | Ante/Retro 8° Short CoCr |
| PHAC1234 | Ante/Retro 8° Long CoCr |
| PHAC1242 | Ante/Retro 15° Short CoCr |
| PHAC1244 | Ante/Retro15° Long CoCr |
| PHAC1252 | Varus/Valgus 8° Short CoCr |

# Profemur® Standard Instrument Kit

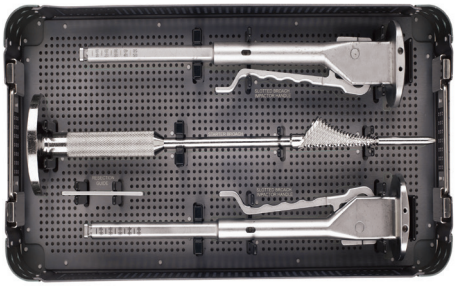
PRGIKIT1



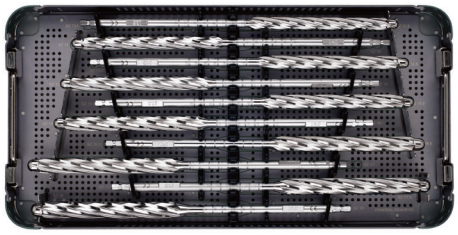

| Catalog No. | Description |
|---|---|
| 20070050 | Modular Neck Inserter |
| 4400FI0000 | Femoral Head Impactor |
| APA00001 | Head/Neck Extractor |
| APA00003 | Head/Neck Extractor Adaptor 12/14 |
| APA00005 | Head/Neck Extractor Cardan Spanner Hex |
| APA00006 | Head/Neck Extractor Tommy Bar |
| APA02121 | Femoral Trial Head 28mm Short (-3.5mm) |
| APA02122 | Femoral Trial Head 28mm Medium (+0mm) |
| APA02123 | Femoral Trial Head 28mm Long (+3.5mm) |
| APA02124 | Femoral Trial Head 28mm XLong (+7mm) |
| APA02125 | Femoral Trial Head 28mm XXLong (+10.5mm) |
| APA02142 | Femoral Trial Head 36mm Short (-3.5mm) |
| APA02144 | Femoral Trial Head 36mm Medium (+0mm) |
| APA02146 | Femoral Trial Head 36mm Long (+3.5mm) |
| APA02148 | Femoral Trial Head 36mm XLong (+7mm) |
| APA02151 | Femoral Trial Head 32mm Short (-3.5mm) |
| APA02152 | Femoral Trial Head 32mm Medium (+0mm) |
| APA02153 | Femoral Trial Head 32mm Long (+3.5mm) |
| APA02154 | Femoral Trial Head 32mm XLong (+7mm) |
| APA04241 | Profemur® MIS Broach Handle (Qty 2) |
| APA04244 | Broach Handle Alignment Guide Rod (Qty 2) |
| APA04750 | Profemur® Starter Reamer |
| APA11102 | Profemur® Short Straight Plastic Trial Neck |
| APA11104 | Profemur® Long Straight Plastic Trial Neck |
| APA11112 | Profemur® Short A/R Var/Val 1 Plastic Trial Neck |
| APA11114 | Profemur® Long A/R Var/Val 1 Plastic Trial Neck |
| APA11122 | Profemur® Short A/R Var/Val 2 Plastic Trial Neck |
| APA11124 | Profemur® Long A/R Var/Val 2 Plastic Trial Neck |
| APA11132 | Profemur® Short A/R 8° Plastic Trial Neck |
| APA11134 | Profemur® Long A/R 8° Plastic Trial Neck |
| APA11142 | Profemur® Short A/R 15° Plastic Trial Neck |
| APA11144 | Profemur® Long A/R 15° Plastic Trial Neck |
| APA11152 | Profemur® Short Var/Val 8° Plastic Trial Neck |
| APA11154 | Profemur® Long Var/Val 8° Plastic Trial Neck |
| K0001016 | Quick Disconnect T-Handle |
| PP275400 | Hex Screwdriver |
| PPR67688 | Slap Hammer Stem Extractor |
| PRFS0450 | Profemur® Box Chisel |
| PRFS0460 | Profemur® Screwdriver Inserter |
| PRFS0462 | Profemur® Broach Extraction Shaft |
| PRFS0463 | Profemur® Tissue Protecting Sleeve |
| PRFS1461 | Profemur® Threaded In-Line Stem Inserter |

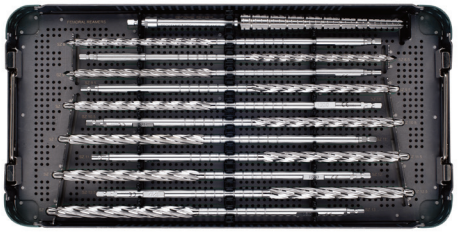


## Instruments

PRZNKIT1

| Catalog No. | Description |
|---|---|
| PLRB0009 | Profemur® Renaissance® Starter Broach |
| PLSB0010 | Profemur® Renaissance® Broach Standard 10 |
| PLSB0011 | Profemur® Renaissance® Broach Standard 11 |
| PLSB0012 | Profemur® Renaissance® Broach Standard 12 |
| PLSB0013 | Profemur® Renaissance® Broach Standard 13 |
| PLSB0014 | Profemur® Renaissance® Broach Standard 14 |
| PLSB0015 | Profemur® Renaissance® Broach Standard 15 |
| PLSB0016 | Profemur® Renaissance® Broach Standard 16 |
| PLSB0017 | Profemur® Renaissance® Broach Standard 17 |
| PLSB0018 | Profemur® Renaissance® Broach Standard 18 |
| PLRB0010 | Profemur® Renaissance® Broach Reduced 10 |
| PLRB0011 | Profemur® Renaissance® Broach Reduced 11 |
| PLRB0012 | Profemur® Renaissance® Broach Reduced 12 |
| PLRB0013 | Profemur® Renaissance® Broach Reduced 13 |
| PLRB0014 | Profemur® Renaissance® Broach Reduced 14 |
| PLRB0015 | Profemur® Renaissance® Broach Reduced 15 |
| PLRB0016 | Profemur® Renaissance® Broach Reduced 16 |
| PLRB0017 | Profemur® Renaissance® Broach Reduced 17 |
| PLRB0018 | Profemur® Renaissance® Broach Reduced 18 |
| PTRG0410 | Profemur® Renaissance® Neck Resection Guide |
| PLRB0016 | Profemur® Slotted Broach Impactor Handle (Qty 2) |





## Instruments

PRZNKIT2

| Catalog No. | Description |
|---|---|
| PSSR1118 | Profemur® Renaissance® Proximal Reamer |
| PRR00080 | Profemur® Femoral Reamer 8 |
| PRR00085 | Profemur® Femoral Reamer 8.5 |
| PRR00090 | Profemur® Femoral Reamer 9 |
| PRR00095 | Profemur® Femoral Reamer 9.5 |
| PRR00100 | Profemur® Femoral Reamer 10 |
| PRR00105 | Profemur® Femoral Reamer 10.5 |
| PRR00110 | Profemur® Femoral Reamer 11 |
| PRR00115 | Profemur® Femoral Reamer 11.5 |
| PRR00120 | Profemur® Femoral Reamer 12 |
| PRR00125 | Profemur® Femoral Reamer 12.5 |
| PRR00130 | Profemur® Femoral Reamer 13 |
| PRR00135 | Profemur® Femoral Reamer 13.5 |
| PRR00140 | Profemur® Femoral Reamer 14 |
| PRR00145 | Profemur® Femoral Reamer 14.5 |
| PRR00150 | Profemur® Femoral Reamer 15 |
| PRR00155 | Profemur® Femoral Reamer 15.5 |
| PRR00160 | Profemur® Femoral Reamer 16 |
| PRR00165 | Profemur® Femoral Reamer 16.5 |
| PRR00170 | Profemur® Femoral Reamer 17 |
| PRR00175 | Profemur® Femoral Reamer 17.5 |
| PRR00180 | Profemur® Femoral Reamer 18 |

## Stem Impactors

| Catalog No. | Description |
|---|---|
| PRCLIMPT | Profemur® Classic Stem Inserter |
| PRFS1461 | Profemur® Threaded Inline Stem Inserter |
| PPF60200 | Final Stem Impactor |
| PRFS0460 | Profemur® Screwdriver Inserter |

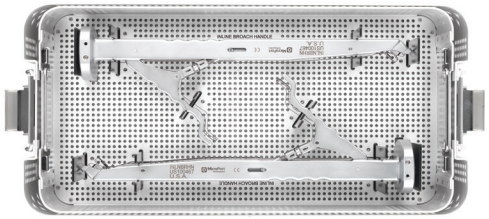
## Woodpecker Broaching System

4251KT10

| Catalog No. | Description |
|---|---|
| APA00930 | Woodpecker |
| APA00931 | Hose Attachment |
| APA00943 | Broach Handle |

## Profemur® Renaissance® X-Ray Templates

| Catalog No. | Description |
|---|---|
| PLS0XR15 | Profemur® Renaissance® Modular X-ray Template 15% Magnification |
| PRNCXR15 | Profemur® Renaissance® Classic Short Neck X-Ray Template 15% Magnification |
| PRNLXR15 | Profemur® Renaissance® Classic Long Neck X-Ray Template 15% Magnification |



## Broach Handle

SPBHKIT1

| Catalog No. | Description |
|---|---|
| INLNBRHN | Inline Broach Handle (Qty 2) |

# Chapter 7
## Indications and Warnings

### Intended Use
MicroPort total hip systems are intended for use in total hip arthroplasty for reduction or relief of pain and/or improved hip function in skeletally mature patients.

### Indications for Use
1) non-inflammatory degenerative joint disease such as osteoarthritis, avascular necrosis, ankylosis, protrusio acetabuli, and painful hip dysplasia;
2) inflammatory degenerative joint disease such as rheumatoid arthritis;
3) correction of functional deformity; and,
4) revision procedures where other treatments or devices have failed

Rough grit blast surfaces and the titanium plasma spray coatings applied to implant surfaces are intended for uncemented arthroplasty.

### Contraindications
Patients should be warned of these contraindications. Contraindications include:
1) overt infection;
2) distant foci of infections (which may cause hematogenous spread to the implant site);
3) rapid disease progression as manifested by joint destruction or bone absorption apparent on roentgenogram;
4) skeletally immature patients (patient is less than 21 years of age at the time of surgery);
5) cases where there is inadequate neuromuscular status (e.g., prior paralysis, fusion and/or inadequate abductor strength), poor bone stock, poor skin coverage around the joint which would make the procedure unjustifiable;
6) neuropathic joints;
7) hepatitis or HIV infection;
8) neurological or musculoskeletal disease that may adversely affect gait or weight-bearing.

### Product-Specific Warnings and Precautions
Do not attempt to seat the implant beyond the envelope of femoral bone preparation. Forcing to seat the implant beyond the prepared femoral bone may increase the chance of bone fracture. In some cases, a portion of the proximal body with or without coating may be visible above the proximal resection level.

The smaller sized femoral implants are intended for patients with narrower intramedullary femoral canals. The geometry of these implants is reduced to accommodate the anatomy of the narrower intramedullary femoral canal, which also decreases the fatigue-strength and load-bearing characteristics of the implant.

### Other Modular Components (Femoral Head and Stems, Modular Necks and Proximal Body)
Scratching of femoral heads, modular necks and proximal and distal stem tapers should be avoided. Repeated assembly and disassembly of these components could compromise the locking action of the taper joint. Prior to assembly, surgical debris must be cleaned from the interior of the female seat of the proximal body to ensure proper locking. Ensure components are firmly seated to prevent disassociation. The femoral head, neck taper of the femoral component, modular neck tapers, body taper, female seat of the proximal body **must** be clean and dry before assembly. Do not resterilize femoral prostheses with ceramic femoral heads seated on the stem. Please refer to the product package insert for specific warnings and precautions regarding ceramic femoral heads.

Stems and modular necks with the MicroPort 12/14 SLT Taper should only be used in combination with femoral heads with the MicroPort 12/14 SLT Taper. Cobalt chrome femoral heads with the MicroPort 12/14 SLT Taper are designed for use with cobalt-chromium-molybdenum, titanium alloy and ISO 5832-9 stainless steel (not available in the U.S. or Canada) femoral components with the MicroPort 12/14 SLT Taper.

The neck/body component or neck/femoral stem should be changed only when clinically necessary. Refer to proper neck extraction technique in the surgical technique.

### Modular Necks
- Cobalt Chrome Modular Necks are not for use with the following devices:
  - Alumina (Biolox Forte) "Ceramic Femoral Head" (size 28mm Long)
- In the United States, ONLY the following stems are cleared to be used with both options of titanium or cobalt chrome modular necks:
  - Profemur® R Stem
  - Profemur® Z Grit Blast Stem
  - Profemur® Renaissance® Stem
  - Profemur® LX Revision Stem
  - Profemur® TL Stem

  All other stems are cleared for use with cobalt chrome modular necks only.

The potential long-term biological effects of metal wear debris and metal ion production are not known. Questions regarding carcinogenicity have been raised in literature; no studies have conclusive evidence that metal wear debris or metal ions are carcinogenic.

NEVER combine modular or hard bearing components made by different manufacturers.

Ceramic femoral heads should not be placed on scratched or previously assembled metal tapers as this may lead to a ceramic fracture.

### IMPORTANT
Prior to use of the system, the surgeon should refer to the product package insert for additional warnings, precautions, indications, contraindications and adverse effects. Instructions For Use package inserts are also available by contacting the manufacturer. Contact information can be found on the back of this Surgical Technique and the Instructions For Use package inserts are available on the website listed.

MicroPort Orthopedics

*Full Function. Faster®*

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EC REP

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The Netherlands
+31 20 545 01 00

The CE-Marking of Conformity is applied per catalog number and appears on the outer package label, if applicable.