



Trabecular Metal™ Primary Hip Prosthesis

Surgical Technique



The Best Thing Next to Bone™



zimmer
Confidence in your hands®

Trabecular Metal Primary Hip Prosthesis Surgical Technique for Primary Hip Arthroplasty

Developed in conjunction with

Richard D. Coutts, MD
San Diego, California

Peter Devane, MD
Wellington, New Zealand

Robert Fada, MD
Columbus, Ohio

George J. Haidukewych, MD
Tampa, Florida

Donald M. Kastenbaum, MD
New York, New York

Hee Joong Kim, MD, PhD
Seoul, Korea

Matti U.K. Lehto, MD, PhD
Tampere, Finland

Mark W. Pagnano, MD
Rochester, Minnesota

Thomas P. Sculco, MD
New York, New York

Kuen Tak Suh, MD
Pusan, Korea

Table of Contents

Design Rationale	2
Preoperative Planning	2
Determination of Leg Length	3
Determination of Abductor Muscle Tension and Femoral Offset	3
Component Size Selection/Templating	4
Surgical Technique	6
Exposure	6
Determination of Leg Length	6
Osteotomy of the Femoral Neck	6
Preparation of the Femur	7
Intramedullary Reaming	7
Femoral Rasping	8
Calcar Planing (Optional)	9
Trial Reduction	9
Insertion of the Femoral Component	11
Attachment of the Femoral Head	12
Wound Closure	12
Postoperative Management	12

Design Rationale

The *Trabecular Metal*™ Primary Hip Stem is designed to potentially provide excellent long term clinical results by maintaining proximal bone density and quality. The stem combines the proven properties of *Trabecular Metal* Technology with design features that improve initial stability, proximally load the femur, enhance biological fixation, and maintain bone stock. The *Trabecular Metal* material provides for initial stability via an inherently high coefficient of friction against bone, which increases the potential for biological fixation. Additionally, the

biological fixation is enhanced with its high, interconnected porosity.^{1,2}

The primary design features of the *Tivanium*® Ti-6Al-4V Alloy stem include a 14° A/P wedge (7° per side) that effectively loads the proximal femur, and a 23.5° neck resection angle that helps to conserve bone and enhances rotational stability (Fig. 1a and 1b).^{3,4} These similar design characteristics have been used successfully with the *Proxilock*® stem since 1994. The stem and rasp designs, along with surgical technique work together to facilitate definitive seating and to potentially provide excellent initial implant stability.



Fig. 1a A/P photo of *Trabecular Metal* Primary Hip Prosthesis



Fig. 1b M/L photo of *Trabecular Metal* Primary Hip Prosthesis

Preoperative Planning

Effective preoperative planning allows the surgeon to predict the impact of different interventions in order to perform the joint restoration in the safest and most accurate manner. Optimal femoral stem fit, the level of the femoral neck cut, the prosthetic neck length, and the femoral component offset can be evaluated through preoperative radiographic analysis. Preoperative planning also allows the surgeon to have the appropriate implants available at surgery.

The overall objective of preoperative planning is to determine the anatomic parameters that will allow accurate intraoperative placement of the femoral implant and optimal joint stability. The specific objectives include:

- 1 determination of leg length,
- 2 establishment of appropriate abductor muscle tension and femoral offset,
- 3 determination of the anticipated component sizes

Determination of Leg Length

Determining the preoperative leg length is essential for restoration of the appropriate leg length during surgery. If leg lengths are equal in both the recumbent and standing positions, the leg length determination is simplified; however, for most patients, leg lengths are not equal. The surgeon should determine the best treatment for various leg length discrepancies, and note how this will impact the process of implanting the *Trabecular Metal* Primary Hip Prosthesis.

Determination of Abductor Muscle Tension and Femoral Offset

After determining the requirements for establishing the desired postoperative leg length, consider the abductor muscle tension. When the patient has a very large offset between the center of rotation of the femoral head and the line that bisects the medullary canal, the insertion of a femoral component with a lesser offset will, in effect, medialize the femoral shaft. To the extent that this occurs, laxity in the abductors will result.

The *Trabecular Metal* Primary Hip Prosthesis addresses this issue by offering two offsets (standard and extended). For stem sizes 11-18, the extended offset offers 5mm greater offset than the standard offset. The additional offset is accomplished by shifting the neck medially, which allows for a change in offset without affecting the leg length. For the *Trabecular Metal* Primary Hip Prosthesis, all stem sizes and offset options have the same 131.5° neck angle.

This versatility in offset enables the surgeon to reproduce almost any offset encountered. Although rare, it may not be possible to restore offset in patients with an unusually large preoperative offset or with a severe varus deformity. In such cases, the surgeon should use the clinically appropriate surgical approach to eliminate the laxity in the abductor muscles. Technical variations in the placement of the acetabular components can also reduce the differences in offset.

Component Size Selection/ Templating

It is recommended that three radiographic views be evaluated when templating. Preoperative planning for insertion of a cementless femoral component requires an anteroposterior (A/P) view of the pelvis, and an anteroposterior (A/P) view and frog leg lateral view of the involved femur on 11x17-inch cassettes. Both views should show at least eight inches of the proximal femur. If desired, A/P and lateral views of the proximal half of the involved femur can also be used in addition to the two required views. It may also be helpful to obtain an A/P view with the involved femur internally rotated. This compensates for naturally occurring femoral anteversion and provides a more accurate representation of the true mediolateral dimension of the metaphysis.

When templating, magnification of the femur will vary depending on the distance from the x-ray source to the film, and the distance from the patient to the film. The *Trabecular Metal* Primary Hip Prosthesis Templates (Fig. 2) use standard 20% magnification, which is near the average magnification on most clinical x-rays.



Fig. 2 Templating for the *Trabecular Metal* Primary Hip Prosthesis

Large patients and obese patients may have magnification greater than 20% because their osseous structures are farther away from the surface of the film. Similarly, smaller patients may have magnification less than 20%. To better determine the magnification of any x-ray film, use a standardized marker at the level of the femur. (Templates of 15% and 10% magnification can be obtained by special order. Digital templates are also available. Contact your Zimmer representative for more information.)

Preoperative planning is also important in choosing the optimal acetabular component and in providing an estimation of the range of acetabular components that might ultimately be required.

Begin the initial templating with the A/P radiograph. Superimpose the acetabular templates sequentially on the pelvic radiograph with the acetabular component in approximately 40° of abduction, with the component medialized against the medial wall of the acetabulum. Range of motion and hip stability are optimized when the socket is placed in approximately 35° to 45° of abduction. Assess several sizes to estimate which acetabular component will provide the best fit for maximum coverage. Comparison of the contralateral, uninvolved hip, is useful, particularly if any acetabular deficiency or abnormality is present. In most cases, select the largest component possible, being certain that the outside diameter isn't too large to seat completely in the acetabulum and will retain peripheral bone. Use of a lateral radiograph of the hip may be helpful for further determining the acetabular component size. (Refer to the *Trabecular Metal* Modular Acetabular System surgical technique for further details on acetabular reconstruction.)

Consider the position and thickness of the acetabular component in estimating the optimum femoral neck length to be used. (To simplify this, the acetabular templates are on a separate acetate sheet from the femoral templates.) Mark the acetabular size, its position, and the center of rotation on the x-ray films. This allows any femoral component to be matched with the desired acetabular component by placing the femoral template over the acetabular template. This will provide the best estimation of femoral component size and head/neck length necessary to achieve the correct leg length.

The *Trabecular Metal* Primary Hip Prosthesis can be used with several head diameters. Select the femoral head size based on the surgical preference. Please consult your local Zimmer sales associate for more information regarding Zimmer femoral head options.

The specific objectives in templating the femoral component include:

- 1 determination of the anticipated size of the implant to be inserted, and
- 2 determination of the height of the implant in the femur and the location of the femoral neck osteotomy.

Select the appropriate femoral template. The *Trabecular Metal* Primary Hip Prosthesis is available in ten standard body sizes (9mm through 18mm). The femoral templates show the neck length and offset for each of the head/neck combinations (-3.5 to +10.5, depending on head diameter). Note that skirts are present on the +7 26mm head; the +10.5 26mm, 28mm, and 32mm heads; and the +3 22mm head.

To estimate the femoral implant size, assess both the body size and the distal stem size on the A/P radiograph, and then check the stem size on the lateral radiograph. Superimpose the template on the metaphysis and estimate the appropriate size of the femoral stem. The body of the femoral component should fill the proximal metaphysis as completely as possible while remaining compatible with the anatomic endosteal contours of that region. Assess the fit of the distal stem with the isthmus of the femur. The prosthesis should fill or nearly fill the isthmus area on the A/P radiograph.

Next, check the fit of the stem on the lateral radiograph. If a larger stem would better fill the metaphysis, it may be preferable to insert the larger stem. When a larger size is chosen to better fill the metaphysis on the lateral film, re-evaluate the A/P film to ensure that the fit of the proximal and distal bodies is acceptable. Careful attention during this process helps the surgeon achieve the goal of implanting a stem that will provide maximum stability and contact with the host bone.

After establishing the proper size of the femoral component, determine the height of its position in the proximal femur and the amount of offset needed to provide adequate abductor muscle tension noting the center of rotation determined during acetabular templating. Generally, if the leg length and offset are to remain unchanged, the center of the head of the prosthesis should be at the same level as the center of the femoral head of the patient's hip. The tip of the greater trochanter can be a good reference point for determining the center of rotation, and the contralateral, uninvolved hip can be assessed to compare this reference mark when determining the femoral neck osteotomy level.

This should also correspond to the center of rotation of the templated acetabulum. To lengthen the limb, raise the template proximally. To shorten the limb, shift the template distally. The extended offset option provides lateral translation of 5mm. This allows for an offset increase of 5mm without changing the vertical height or leg length. The femoral head lengths will also affect leg length and offset.

Once the height has been determined, note the distance in millimeters from the osteotomy line to the appropriate anatomic landmarks based on surgical technique. This can be measured using the millimeter scale on the templates, and will be used during the femoral preparation to ensure the proper neck resection level.

Proximal/distal adjustments in prosthesis position can reduce the need for a femoral head with a skirt.

CAUTION: The skirted heads allow less range of motion than the nonskirted heads, which may increase the chance of dislocation.

Surgical Technique

Exposure

The *Trabecular Metal* Primary Hip Prosthesis can be implanted using a variety of surgical approaches; the specific approach used depends on surgeon preference. The system is compatible with the *Zimmer Minimally Invasive Solutions™ (MIS™)* techniques taught through the Zimmer Institute. Please contact your Zimmer representative for information on these surgical techniques.

Determination of Leg Length

Establish landmarks and obtain measurements before dislocating the hip so that, after reconstruction, a comparison of leg length and femoral shaft offset can be obtained. From this comparison, adjustments can be made to achieve the goals established during preoperative planning. There are several methods to measure leg length. Select the most appropriate based on surgical technique.

Osteotomy of the Femoral Neck

Dislocate the hip based on surgical approach.

Select the *Trabecular Metal* Primary Osteotomy Guide that corresponds with the size determined during templating, and superimpose it on the femur (Fig. 3). Align the axis of the osteotomy guide with the axis of the femur. For a neutral neck osteotomy, place the osteotomy guide so the notch on the lateral edge of the guide lines up with the superior tip of the greater trochanter (Fig. 4).



Fig. 3 Osteotomy guide on femur.



Fig. 4 Lateral notch of osteotomy guide lined up with the tip of the greater trochanter.

After determining the desired level of resection, use a marking pen to make a line across the femoral neck parallel to the neck resection line located on the osteotomy guide.

Refer to the distance from the anatomic landmark(s) to the osteotomy level that was determined during preoperative templating to make sure the osteotomy line is accurate.

Using the line as a guide, perform the osteotomy. To prevent possible damage to the greater trochanter, stop the cut as the saw approaches the greater trochanter. Remove the saw and either bring it in from the superior portion of the femoral neck to complete the osteotomy cut, or use an osteotome to finish the cut.

Note: If extensive osteophytes are present, be careful not to osteotomize the femoral neck too short.

Preparation of the Femur

With the proximal femur extending out of the wound, remove soft tissue from the medial portion of the greater trochanter and lateral portion of the femoral neck. It is crucial to adequately visualize this area so the correct insertion site for femoral reaming can be located. Refer to the preoperative planning and identify the extension of the mid-femoral shaft intraoperatively as viewed on the A/P and lateral radiographs. This is usually in the area of the piriformis tendon insertion in the junction between the medial portion of the greater trochanter and lateral femoral neck.

Use the Box Osteotome (Fig. 5), Trochanteric Reamer, or a burr to remove bone from the medial portion of the greater trochanter and the lateral portion of the femoral neck. There must be sufficient space in this area for the

passage of each sequential rasp to ensure neutral rasp/implant alignment. Insufficient space may result in improper stem positioning. However, the space should not be larger than the rasp or implant.

It is important to lateralize the starting point for rasping and implant insertion. Assessment of the amount of trochanteric overlap over the proximal femoral canal on the preoperative A/P radiograph can be useful in determining the degree of lateralization necessary to ensure neutral component positioning. After removing the cortical bone, insert the Tapered Awl (Fig. 6) to open the medullary canal. This will provide a reference for the direction of femoral reaming and rasping.

To aid neutral alignment, the Trochanteric Reamer (00-7896-010-00) may be used to lateralize the proximal entry point.

Intramedullary Reaming

The *Trabecular Metal* Primary Hip Prosthesis has a distal taper that begins at the end of the medial curve distal to the *Trabecular Metal* pad (Fig. 7). At this transition point, the prosthesis starts to become smaller than the reamer. As a result, the length of contact between the prosthesis and distal medullary canal is minimized.



Fig. 5 Use of Box Osteotome



Fig. 6 Use of Tapered Awl



Fig. 7 The *Trabecular Metal* Primary Hip and the tapered geometry.

Because of the taper and distal reamer-to-prosthesis relationship, the objectives of intramedullary reaming are different from those for a prosthesis with a cylindrical distal geometry. The specific objectives for reaming for the *Trabecular Metal Primary Hip Prosthesis* are:

- 1 Help ensure that the prosthesis is placed in a neutral position within the femur. Failure to properly ream in line with the longitudinal axis of the femoral canal may increase the risk of placing the femoral component in varus or valgus alignment.
- 2 Provide feedback to the surgeon regarding the size of the distal medullary canal, which may help to determine the appropriate size prosthesis, in case of a metaphyseal/diaphyseal mismatch.
- 3 Remove any obstacles in the distal medullary canal that may cause impingement and prevent the prosthesis from seating correctly.

The femoral reaming process is initiated with the tapered awl (approximately 8mm diameter preparation). The reamer size increases corresponding to the implant size, starting at size 9. Each reamer must be advanced fully to achieve appropriate depth. This is done by advancing the reamer until the groove cut into the cutting flutes is at the level of the osteotomy (Fig. 8).

Sequentially increase the reamer size, making sure that each reamer is advanced fully to its appropriate depth. Ream until the desired canal size has been created.

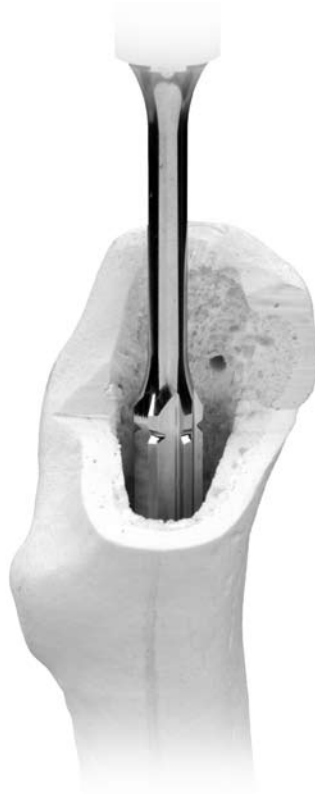


Fig. 8 Position of reamer when fully advanced

Femoral Rasping

The rasps are designed to properly prepare the proximal femur for insertion of the implant. One characteristic of the design of the rasp is the anterior and posterior proximal bone compacting areas (Fig. 9). These areas do not have cutting teeth and are designed to densify cancellous bone in the proximal anterior and posterior zones of the femur. There is one rasp for every implant size.

Begin rasping with the starter rasp when implanting sizes 9, 10, and 11, and a rasp at least three sizes smaller for all other sizes (Fig. 10). Use only *Trabecular Metal Primary Hip Prosthesis Rasps* (00-7865-008/018-00).



Fig. 9 Proximal A/P tamping zone on rasp



Fig. 10

When rasping, be sure that the rasp advances with each blow of the mallet. The final rasp should fit and fill the proximal femur, with the top of the rasp resting at the level of the neck resection, and be rotationally stable. The rasp handle is undersized to allow the rasp to be countersunk. If the rasp can be seated at least 5mm below the osteotomy, progress to the next rasp size and repeat until the predicted final rasp size has been seated. If the predicted final rasp size can be countersunk more than 5mm below the osteotomy and adequate cancellous bone is available in the metaphyseal region, progress to the next larger rasp size. Make sure cancellous bone is available proximally as the A/P width of the rasp allows up to 1mm press-fit per side with the implant.

Note: Before using the next size rasp, be sure that the opening is large enough. If it is not, use the Box Osteotome again.

Progressing to the next larger rasp/implant size is recommended only for cases where adequate cancellous bone is available on the anterior and posterior sides of the proximal femur, and the distal medullary canal is large enough to accept the next larger size. The distal canal must be reamed to a larger diameter to accept the next size implant. If the femur will accept a larger size than was determined during preoperative templating, it is important to re-evaluate leg length and offset as the neck lengths for the *Trabecular Metal* Primary Hip Prosthesis increase with each increase in stem size.

Unlock and remove the rasp handle, leaving the last rasp in the canal.

Calcar Planing (Optional)

The *Trabecular Metal* Primary Hip Prosthesis is collarless; therefore calcar planing is optional. If electing to calcar plane, select either the large or small calcar planer and attach it to a power source. Place the planer over the rasp trunion, and mill the calcar flush with the rasp face. Be sure the planer is rotating before engaging the calcar. This will prevent the planer from binding on the calcar.

Trial Reduction

Assemble the appropriate size and offset (standard or extended) Neck Provisional and Femoral Head Provisional to the rasp.

Perform a trial reduction (Fig. 11). Check the leg length and offset of the femur, and compare them to the measurements made before the initial dislocation of the hip. Be sure to reposition the leg exactly where it was during the first measurement. To adjust the neck length, change the Femoral Head Provisional. The *Zimmer 12/14* Femoral Heads sizes 26, 28, 32, 36, and 40mm have five neck lengths (-3.5, +0, +3.5, +7, and +10.5mm), providing a total range of 14mm. Zimmer also offers 38mm and 44mm femoral heads with four neck lengths (-4.0, +0, +4.0, and +8.0mm). An intraoperative A/P pelvic radiograph may also be taken to assess leg length, prosthesis size and fit.



Fig. 11

When satisfactory leg length, offset, range of motion, and stability have been achieved, dislocate the hip and remove the provisional components and rasp.

Trabecular Metal Primary Stem Inserter and Stem Attachment

There are two stem inserters in the *Trabecular Metal* Hip Prosthesis instrument system; a *VerSys*® Stem Driver (00-7896-052-00) for sizes 9 and 10, and a Stem Inserter (00-4089-008-01/04) for sizes 11 through 18.

The *VerSys* Stem Driver allows for rotational control of the implant through an oval design, but not rigid fixation to the implant. The stem inserter allows for rigid fixation to the implant.

The Stem Inserter consists of two components: the Stem Inserter Handle and the Stem Inserter Rod (Fig. 12). Assemble the instruments by inserting the Stem Inserter Rod into the cannulated Stem Inserter Handle, and fully thread the rod into the handle.



Fig. 12 Stem Inserter Handle and Stem Inserter Rod disassembled

Insert the keyed tip of the Stem Inserter Handle into the mating insertion hole on the stem shoulder (Fig. 13). Turn the strike plate on the Stem Inserter Rod clockwise until the threads on the tip of the rod fully engage the threads in the insertion hole on the stem. The threads must be fully engaged to avoid potential damage to the stem inserter assembly, and to ensure that the strike plate is fully seated against the impactor plate on the Stem Inserter Handle (Fig. 14).



Fig. 13 Keyed tip of Stem Inserter Handle and keyed inserter feature on stem



Fig. 14a Strike plate fully seated against impactor plate



Fig. 14b Strike plate not fully seated against impactor plate

Note: Do not use the stem inserter assembly to extract the implant during revision surgery. The *Trabecular Metal Primary Hip Prosthesis Standard Instrument Set* includes an extractor instrument. Light intra-operative extraction may be done with the fully assembled stem inserter.

Note: Do not use the stem inserter rod as a stand-alone instrument (Fig. 15)

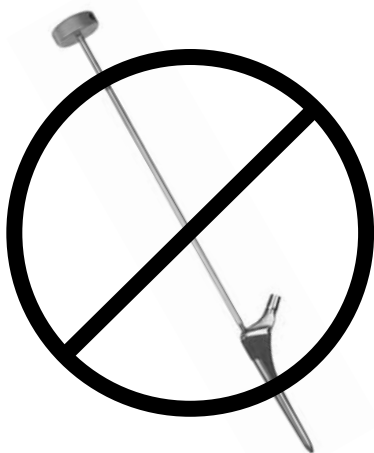


Fig. 15 Stem Inserter Rod should not be used as a stand alone instrument

Note: If preferred, the Stem Inserter Handle, without the Stem Inserter Rod, may be used as a stem driver (Fig. 16).



Fig. 16 Stem Handle can be used on stem

Insertion of the Femoral Component

If implanting a size 9 or 10, press the implant down the canal by hand until it will no longer advance. Place the VerSys Stem Driver (00-7896-052-00) into the mating inserter feature.

If implanting a size 11 through 18, press the implant down the canal by hand until it will no longer advance using the stem inserter (Fig. 17).



Fig. 17 Trabecular Metal Primary Hip being inserted into the femur.

Begin to advance the implant by impacting the strike plate on the Stem Inserter Rod/Stem Driver with a mallet using constant, moderate blows until the prosthesis is fully seated. The prosthesis will advance less with each blow as it approaches final seating due to the nature of the tapered geometry. The prosthesis is fully seated when the most proximal part of the porous surface is at the level of the osteotomy line, it no longer advances, and it is stable.

If the implant does not advance with each moderate blow of the mallet, stop the insertion and remove the component. Repeat reaming and rasping to remove any obstructions that are preventing the insertion, and insert the component again.

To disassemble the stem inserter assembly, turn the strike plate on the Stem Inserter Rod counterclockwise while holding the handle until the threaded portion can be removed from the handle.

The rasps and corresponding implants are sized to provide a slight interference fit (1/8mm) in all regions of the porous surface except for the anterior/posterior proximal taper. Here, the rasp does not cut, but compacts and densifies the cancellous bone within the proximal femur. The proximal interference tapers from the slight press fit described above to 0.75mm for sizes 9 – 11 and 1.0mm for sizes 12 – 18 per side at the most proximal region of the A/P taper. Additional anterior/posterior flats just below the taper minimize the interference with the posterior aspect of the femoral cortices.

Femoral Component Extraction

An extraction instrument is included in the instrument set. To assemble the extractor instrument, attach the Taper Stem Extractor (00-4089-009-00) to the Slap Hammer Adapter (00-9986-030-15) and screw the assembly to the Slap Hammer (00-6551-006-00) (Fig. 19).



Fig. 19 Components of extractor assembly

To remove a fully seated femoral component, slide the stem taper through the loop at the base of the stem extractor. Apply pressure medially to the extractor assembly, and use the slap hammer to remove the component (Fig. 20).

Note: Do not re-insert an extracted femoral component.



Fig. 20 Stem being extracted, showing medial pressure

Attachment of the Femoral Head

Once the implant is fully seated in the femoral canal, place the selected Femoral Head Provisional onto the taper of the implant. Perform a final trial reduction to assess joint stability, range of motion, and restoration of leg length and offset. When the appropriate femoral head implant is confirmed, remove the Femoral Head Provisional and check to ensure that the 12/14 taper is clean and dry. Place the selected femoral head on the taper and secure it firmly by twisting it and striking it once with the Head Impactor (Fig. 21). Proper engagement of the

taper mechanism is related only to the force of impaction of a single blow. Successive impaction blows may either disrupt the morse taper bond or risk femoral fracture. Test the security of the head fixation by trying to remove the head by hand.



Fig. 21 Head being impacted on stem

Note: Do not impact the femoral head onto the taper before driving in the prosthesis as the femoral head may loosen during impaction.

Reduce the hip and assess leg length, range of motion, stability, and abductor tension for the final time.

Wound Closure

After obtaining hemostasis, close the wound per surgical technique, and if appropriate, insert a *Hemovac*® Wound Drainage Device.

Postoperative Management

The postoperative management of patients with a *Trabecular Metal* Primary Hip Prosthesis is determined by the surgical approach and the surgeon's preferred postoperative protocol.

Trabecular Metal Primary Hip Prosthesis

Implants

Standard Offsets

Item Number	Product Description
00-7864-009-00	<i>Trabecular Metal</i> Primary Fem. Stem Size 9
00-7864-010-00	<i>Trabecular Metal</i> Primary Fem. Stem Size 10
00-7864-011-00	<i>Trabecular Metal</i> Primary Fem. Stem Size 11
00-7864-012-00	<i>Trabecular Metal</i> Primary Fem. Stem Size 12
00-7864-013-00	<i>Trabecular Metal</i> Primary Fem. Stem Size 13
00-7864-014-00	<i>Trabecular Metal</i> Primary Fem. Stem Size 14
00-7864-015-00	<i>Trabecular Metal</i> Primary Fem. Stem Size 15
00-7864-016-00	<i>Trabecular Metal</i> Primary Fem. Stem Size 16
00-7864-017-00	<i>Trabecular Metal</i> Primary Fem. Stem Size 17
00-7864-018-00	<i>Trabecular Metal</i> Primary Fem. Stem Size 18

Extended Offsets

Item Number	Product Description
00-7864-011-20	<i>Trabecular Metal</i> Primary Fem. Stem Size 11 Ext.
00-7864-012-20	<i>Trabecular Metal</i> Primary Fem. Stem Size 12 Ext.
00-7864-013-20	<i>Trabecular Metal</i> Primary Fem. Stem Size 13 Ext.
00-7864-014-20	<i>Trabecular Metal</i> Primary Fem. Stem Size 14 Ext.
00-7864-015-20	<i>Trabecular Metal</i> Primary Fem. Stem Size 15 Ext.
00-7864-016-20	<i>Trabecular Metal</i> Primary Fem. Stem Size 16 Ext.
00-7864-017-20	<i>Trabecular Metal</i> Primary Fem. Stem Size 17 Ext.
00-7864-018-20	<i>Trabecular Metal</i> Primary Fem. Stem Size 18 Ext.

Instruments

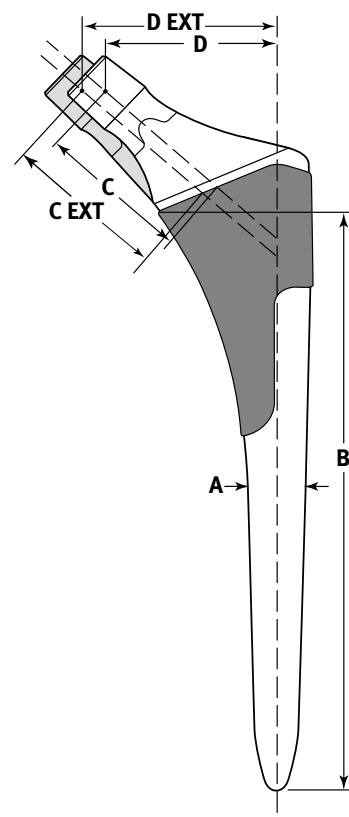
Item Number	Product Description
00-7865-001-00	<i>Trabecular Metal</i> Primary Standard Instrument Set
00-7865-010-00	Size 10 rasp
00-7865-011-00	Size 11 rasp
00-7865-012-00	Size 12 rasp
00-7865-013-00	Size 13 rasp
00-7865-014-00	Size 14 rasp
00-7865-015-00	Size 15 rasp
00-7865-016-00	Size 16 rasp
00-7865-035-20(2)	2 rasp handles
00-4089-008-01	Femoral Stem Driver
00-4089-008-04	Inner Threaded Rod
00-7865-011-50	Size 11 osteotomy guide
00-7865-012-50	Size 12 osteotomy guide
00-7865-013-50	Size 13 osteotomy guide
00-7865-014-50	Size 14 osteotomy guide
00-7865-015-50	Size 15 osteotomy guide
00-7865-016-50	Size 16 osteotomy guide
00-7865-054-11	Size 11 neck provisional, standard
00-7865-054-12	Size 12 neck provisional, standard
00-7865-054-13	Size 13 neck provisional, standard
00-7865-054-14	Size 14 neck provisional, standard
00-7865-054-15	Size 15 neck provisional, standard
00-7865-054-16	Size 16 neck provisional, standard
00-7865-055-11	Size 11 neck provisional, extended
00-7865-055-12	Size 12 neck provisional, extended
00-7865-055-13	Size 13 neck provisional, extended
00-7865-055-14	Size 14 neck provisional, extended
00-7865-055-15	Size 15 neck provisional, extended
00-7865-055-16	Size 16 neck provisional, extended
70.00.01A	Version control bar
00-4089-009-00	Taper stem extractor
00-9986-030-15	Slap Hammer Adapter
00-7865-030-00	<i>Trabecular Metal</i> Primary - Standard Instrument Case

Item Number	Product Description
00-7865-001-01	Trabecular Metal Primary Reamer Set Size 9-16
00-7865-010-09	Size 09 reamer
00-7865-010-10	Size 10 reamer
00-7865-010-11	Size 11 reamer
00-7865-010-12	Size 12 reamer
00-7865-010-13	Size 13 reamer
00-7865-010-14	Size 14 reamer
00-7865-010-15	Size 15 reamer
00-7865-010-16	Size 16 reamer
00-7865-045-00	Trabecular Metal Primary Reamer Case
00-7865-002-00	Trabecular Metal Primary Supplemental Instruments
00-9801-032-00	Calcar planer small
00-9801-033-00	Calcar planer large
00-6601-054-00	Osteotome box, small
00-6601-056-00	Osteotome box, large
00-7896-010-00	Trochanteric reamer
00-7896-004-00	Tapered awl
00-6551-060-00	T-handle Zimmer Chuck
00-0155-002-00	Mallet 2 lb
00-6601-004-00	Extractor Hammer for Rasp
00-9027-058-00	Head Impactor
00-6551-006-00	Slap Hammer
00-7865-025-00	Trabecular Metal Primary Supplemental Instrument Case
00-7865-002-01	Femoral head provisionals, 22mm and 26mm heads
00-7803-022-01	Size 22mm provisional head -2.0mm
00-7803-022-02	Size 22mm provisional head +0mm
00-7803-022-03	Size 22mm provisional head +3.0mm
00-7803-026-01	Size 26mm provisional head -3.5mm
00-7803-026-02	Size 26mm provisional head +0mm
00-7803-026-03	Size 26mm provisional head +3.5mm
00-7803-026-04	Size 26mm provisional head +7.0mm
00-7803-026-05	Size 26mm provisional head +10.5mm
00-7865-029-10	Femoral Head Tray 22 & 26mm

Item Number	Product Description
00-7865-002-02	Femoral head provisionals, 28mm and 32mm heads
00-7803-028-01	Size 28mm provisional head -3.5mm
00-7803-028-02	Size 28mm provisional head +0mm
00-7803-028-03	Size 28mm provisional head +3.5mm
00-7803-028-14	Size 28mm provisional head +7.0mm
00-7803-028-05	Size 28mm provisional head +10.5mm
00-7803-032-01	Size 32mm provisional head -3.5mm
00-7803-032-02	Size 32mm provisional head +0mm
00-7803-032-03	Size 32mm provisional head +3.5mm
00-7803-032-14	Size 32mm provisional head +7.0mm
00-7803-032-05	Size 32mm provisional head +10.5mm
00-7865-029-20	Femoral Head Tray 28 & 32mm
00-7865-003-00	Trabecular Metal Primary Micro Instruments
00-7865-008-00	Trabecular Metal Primary Starter Rasp
00-7865-009-00	Size 9 rasp
00-7865-054-09	Size 9 neck provisional, standard
00-7865-054-10	Size 10 neck provisional, standard
00-7865-009-50	Size 9 osteotomy guide
00-7865-010-50	Size 10 osteotomy guide
00-7896-052-00	VerSys stem driver
00-7865-035-00	Trabecular Metal Primary Micro Instrument Case
00-7865-004-00	Trabecular Metal Primary Macro Instruments
00-7865-017-00	Size 17 rasp
00-7865-018-00	Size 18 rasp
00-7865-054-17	Size 17 neck provisional, standard
00-7865-054-18	Size 18 neck provisional, standard
00-7865-055-17	Size 17 neck provisional, extended
00-7865-055-18	Size 18 neck provisional, extended
00-7865-017-50	Size 17 osteotomy guide
00-7865-018-50	Size 18 osteotomy guide
00-7865-010-17	Size 17 reamer
00-7865-010-18	Size 18 reamer
00-7865-040-00	Trabecular Metal Primary Macro Instrument Case

Prod. No. STD offset	A Stem Size (mm)	B Stem Length (mm)	C Neck Length (mm) When Head/Neck Component Selected is:					D Stem Offset (mm) When Head/Neck Component Selected is:				
			-3.5	+0	+3.5	+7.0	+10.5	-3.5	+0	+3.5	+7.0	+10.5
00-7864-009-00	9	100	24.3	27.8	31.3	34.8	38.3	28.4	31.0	33.6	36.2	38.9
00-7864-010-00	10	106	25.3	28.8	32.3	35.8	39.3	29.9	32.5	35.1	37.7	40.4
00-7864-011-00	11	117	28.4	31.9	35.4	38.9	42.4	32.9	35.5	38.1	40.7	43.4
00-7864-012-00	12	128	31.4	34.9	38.4	41.9	45.4	35.9	38.5	41.1	43.7	46.4
00-7864-013-00	13	138	32.4	35.9	39.4	42.9	46.4	37.4	40.0	42.6	45.2	47.9
00-7864-014-00	14	149	33.4	36.9	40.4	43.9	47.4	38.9	41.5	44.1	46.7	49.4
00-7864-015-00	15	160	34.4	37.9	41.4	44.9	48.4	40.4	43.0	45.6	48.2	50.9
00-7864-016-00	16	171	35.6	39.1	42.6	46.1	49.6	41.9	44.5	47.1	49.7	52.4
00-7864-017-00	17	172	36.5	40.0	43.5	47.0	50.5	43.4	46.0	48.6	51.2	53.9
00-7864-018-00	18	172	37.4	40.9	44.4	47.9	51.4	44.9	47.5	50.1	52.7	55.4

Prod. No. EXT offset	A Stem Size (mm)	B Stem Length (mm)	C EXT Neck Length (mm) When Head/Neck Component Selected is:					D EXT Stem Offset (mm) When Head/Neck Component Selected is:				
			-3.5	+0	+3.5	+7.0	+10.5	-3.5	+0	+3.5	+7.0	+10.5
00-7864-011-20	11	117	30.6	34.1	37.6	41.1	44.6	37.9	40.5	43.1	45.7	48.4
00-7864-012-20	12	128	33.6	37.1	40.6	44.1	47.6	40.9	43.5	46.1	48.7	51.4
00-7864-013-20	13	138	34.6	38.1	41.6	45.1	48.6	42.4	45.0	47.6	50.2	52.9
00-7864-014-20	14	149	35.6	39.1	42.6	46.1	49.6	43.9	46.5	49.1	51.7	54.4
00-7864-015-20	15	160	36.6	40.1	43.6	47.1	50.6	45.4	48.0	50.6	53.2	55.9
00-7864-016-20	16	171	37.8	41.3	44.8	48.3	51.8	46.9	49.5	52.1	54.7	57.4
00-7864-017-20	17	172	38.6	42.1	45.6	49.1	52.6	48.4	51.0	53.6	56.2	58.9
00-7864-018-20	18	172	39.7	43.2	46.7	50.2	53.7	49.9	52.5	55.1	57.7	60.4



1. Gruen T, Hanssen A, Lewallen D, Lewis R, O'Keefe T, Stulberg, SD, Sutherland C, Poggie RA. Radiographic evaluation of a monoblock acetabular component – A multicenter study with 2 to 5 year results. *JOA*, Vol. 20, No. 3, April 2005: 369-378.
2. Zhang Y, Ahn PB, Fitzpatrick DC, Heiner AD, Poggie RA, Brown TD. Interfacial frictional behavior: Cancellous bone, cortical bone, and a novel porous tantalum biomaterial. *Journal of Musculoskeletal Research*. 1993; 3 (4): 245-251.
3. O'Keefe TJ, Lewis RJ, Unger AS. ProxiLock Femoral Hip Stem – Two to Five Year Results. Poster 046, The 70th Annual Meeting of the American Academy of Orthopaedic Surgeons, New Orleans, LA. February 5-9, 2003.
4. O'Keefe T, Cohen RC, Averill RA, et al. Design principles of a proximal locking cementless stem. Proc Australian Orthopaedic Assoc, Brisbane, Australia, 1999.



Please refer to package insert for complete product information, including contraindications, warnings, precautions, and adverse effects.

Contact your Zimmer representative or visit us at www.zimmer.com

