ZMR® Crossover Instruments

Abbreviated Surgical Technique

zimmer

Personal Fit. Renewed Life.™

Introduction

ZMR Crossover Instruments facilitate the combination of any Porous Proximal Body with any Taper Stem in the *ZMR* System, thus allowing extensive fixation in the femur. The instrumentation and implant combinations provide the opportunity to treat wide variances in patient anatomy.

Tapered Stems

ZMR Revision Taper Components were designed to achieve secure distal fixation in the femur using a sharply splined and tapered distal stem with a roughened titanium surface. The tapered distal stem is designed to wedge into the femoral medullary canal, transferring axial and bending forces, while the splines are press-fit into the bone to provide rotational stability. The roughened *Tivanium*® Ti-6Al-4V Alloy surface allows bone ongrowth.[1,2,3] A bevel at the distal end of the stem is a design feature intended to increase the ease of insertion, to better accommodate the bow of the femur, and decrease the potential for distal femoral cortical perforation.

Published clinical results of other stems using this design philosophy (tapered, splined with a roughened titanium alloy surface) in femoral revision surgery have been impressive. These results show the favorable remodeling of proximal femoral bone stock when excessive bone loss was present.[4,5]

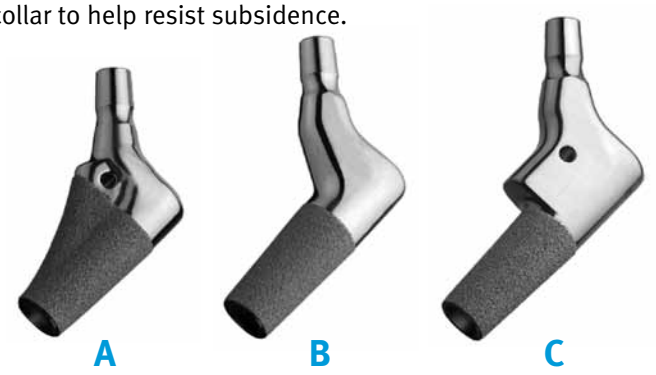
Porous Body Options

Multiple sizes in each body type allow for metaphyseal filling, proximal fixation, and proximal support of the prosthesis.

Spout Body (A) – The Spout Body helps achieve medial fill in the femur, contributing to initial rotational stability.

Cone Body (B) – The Cone Body addresses cases where the Spout Body's medial geometry is not desired. The Cone Body provides the opportunity for infinite version adjustment.

Calcar Body (C) – The Calcar Body has a medial collar to help resist subsidence.



Simplicity

Crossover Instruments, consisting of proximal and distal reamers, are contained in just one additional tray, facilitating ease of the surgical procedure. Cannulated proximal reamers match the porous body geometry and facilitate a similar technique compared to the existing Revision Taper System.

Please note:

1. The Distal Crossover Reamer is identifiable by its titanium nitrided (gold color) cutting flutes.
2. The Proximal Crossover Reamer is discernable from the standard Porous Proximal Reamer by its titanium nitrided (gold color) shaft.

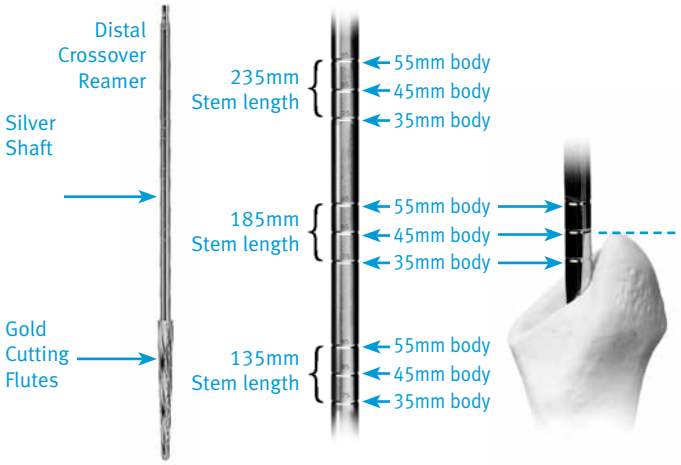
Distal Canal Preparation

1 Ream Distal Femur

Based on preoperative templating, ream the distal femur to the appropriate size and depth. Hand reaming is recommended.

2 Final Ream

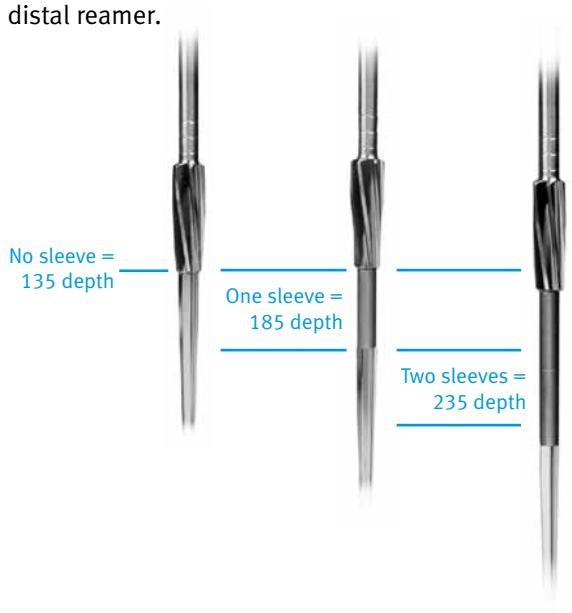
Advance the final reamer until it corresponds to one of the three body heights (35mm, 45mm, or 55mm) and leave the reamer in place. Remove the T-handle from the reamer and note the stem length chosen. Consider obtaining a cross-table A/P radiograph to confirm proper sizing and positioning in the femur.



Proximal Femoral Preparation

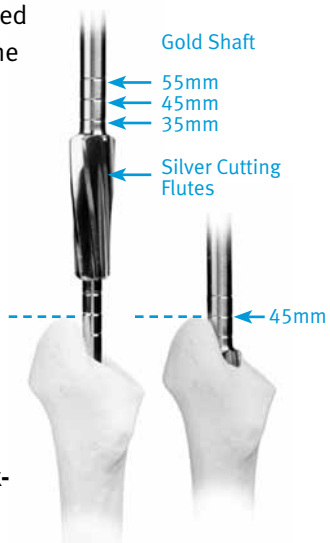
3 Assess Need for Sleeve

From the stem length selected, determine if a sleeve is required and if needed, place the appropriate sleeve(s) on the distal reamer.



4 Ream Proximal Femur

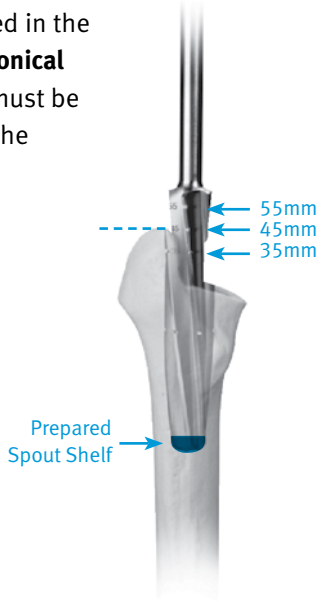
Starting with a cannulated proximal cone reamer one or two sizes smaller than the templated size, ream the proximal femur to the appropriate size. Match the depth of the reamer to the depth noted in Step One.



WARNING: The standard junction *ZMR* Hip System should only be used when full proximal support will be achieved in the area of the plasma spray. This is necessary because without full proximal support, the mid-stem junction is vulnerable to fracture. If such proximal support cannot be achieved, evaluate the use of the *ZMR* XL.

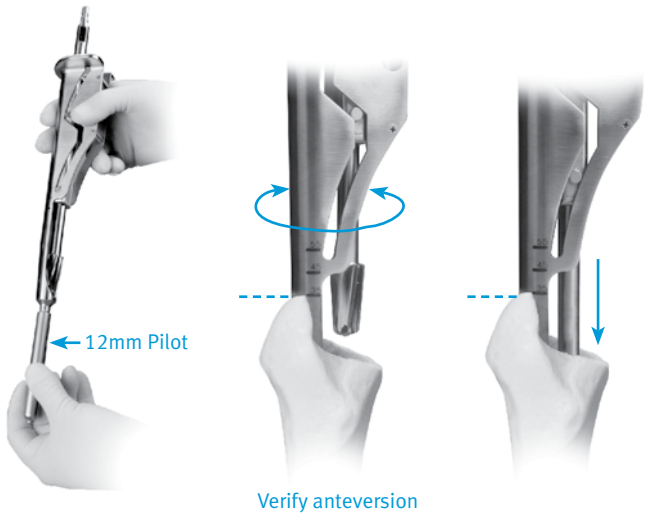
5 Prepare Femur for Spout Body (Optional)

If a Spout Body is to be used in the patient, the **Porous Body Conical Reamer** (non-cannulated) must be used to ream the shelf for the Spout Mill Guide.



5a Mill Femur (Optional)

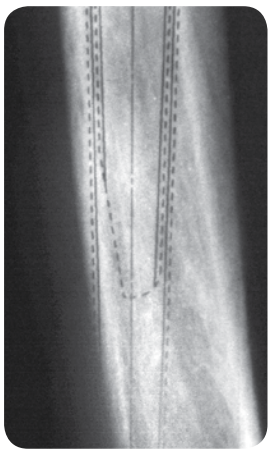
The Spout Mill Guide and Cutter can then be used to prepare the medial metaphysis. The 12mm Distal Pilot should be used to center the Guide in the canal.



Trial Reduction

6 Assemble Trial

Assemble the appropriate proximal body and distal stem provisionals and position the distal tip bevel anteriorly.



7 Check Positioning in Femur

Insert the assembled trial into the proximal femur after visualizing the medullary canal to retrieve any debris from reaming. If trial will not completely seat, check position of anterior bevel and/or re-ream distal canal, if necessary.

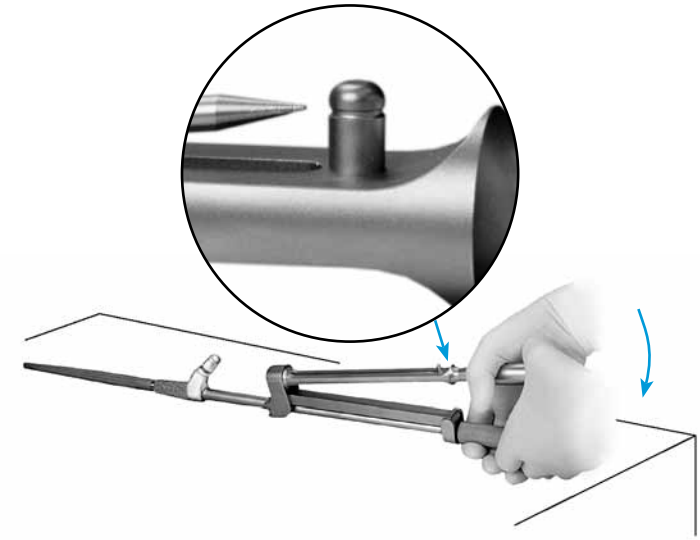
Implant Insertion

8 Lock Assembled Trial

Once assembled, tighten the Compression Nut with the Torque Wrench Assembly. Perform trial reduction.

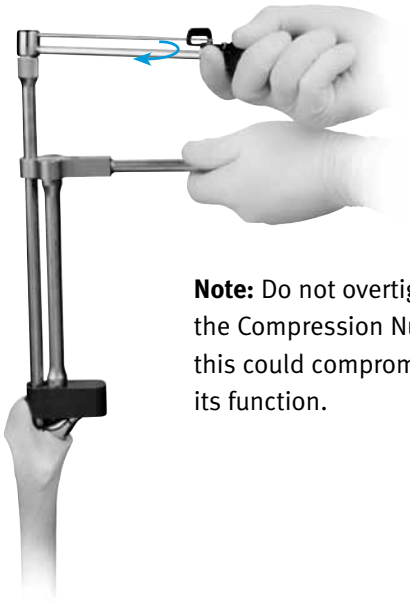
9 Assemble Implant

Assemble the final implants with the Junction Assembly Tool while taking care to replicate the rotational orientation of the anterior bevel.



10 Lock Assembled Construct

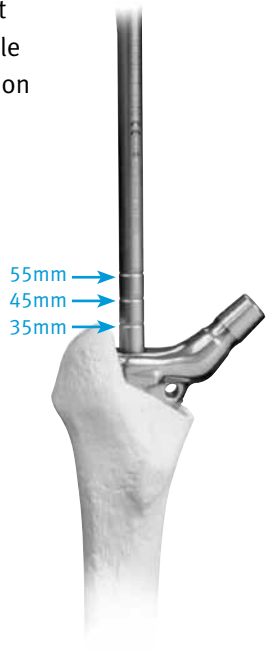
Insert the Compression Nut and tighten to 15N-m.



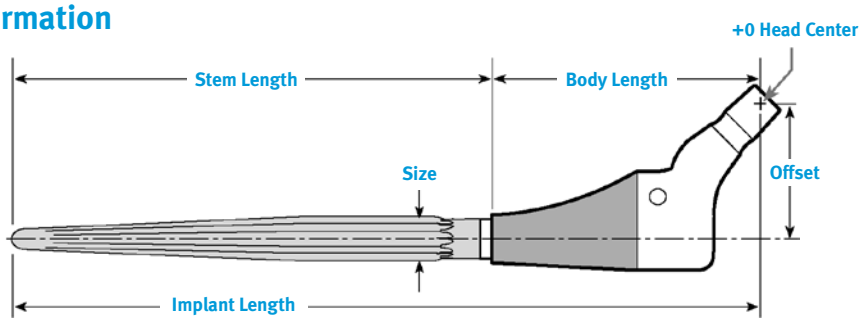
Note: Do not overtighten the Compression Nut as this could compromise its function.

11 Insert Implant

Insert the assembled implant to the appropriate depth while maintaining proper anteversion of the femoral neck.



Ordering Information



Assembled Implant Length*

Body Length (mm)	+	Stem Length (mm)	=	Implant Length (mm)
75		135		210
75		185		260
75		235		310
80		135		215
80		185		265
80		235		315
90		135		225
90		185		275
90		235		325
100		135		235
100		185		285
100		235		335

* Using +0mm Head Center

Note: For more details, refer to the *ZMR* Hip System brochure (97-9990-001-00), or the Revision Taper Surgical Technique (97-9982-002-00) and Porous Revision Surgical Technique (97-9990-002-00).

Instruments

Prod. No.	Description
00-9965-000-02	Crossover Instrument Set
*00-9965-001-16	Proximal Crossover Reamer Size AA Body
00-9965-001-17	Proximal Crossover Reamer Size A Body
00-9965-001-18	Proximal Crossover Reamer Size B Body
00-9965-001-19	Proximal Crossover Reamer Size C Body
00-9965-001-20	Proximal Crossover Reamer Size D Body
00-9965-001-21	Proximal Crossover Reamer Size E Body
00-9965-001-23	Proximal Crossover Reamer Size F Body
00-9965-013-13	Distal Crossover Reamer Size 13
00-9965-014-13	Distal Crossover Reamer Size 14
00-9965-015-13	Distal Crossover Reamer Size 15
00-9965-016-13	Distal Crossover Reamer Size 16
00-9965-017-13	Distal Crossover Reamer Size 17
00-9965-018-13	Distal Crossover Reamer Size 18
00-9965-019-13	Distal Crossover Reamer Size 19
00-9965-020-18	Distal Crossover Reamer Size 20
00-9965-022-18	Distal Crossover Reamer Size 22
00-9975-037-05	Conical Reamer Sleeve
00-9976-010-00	Crossover Reamer Case

* Contact Zimmer Customer Service for availability.

References

1. Feighan JE, Goldberg VM, Davy D, et al. The influence of surface-blasting in the incorporation of titanium-alloy implants in a rabbit intramedullary model. *J Bone Joint Surg.* 1995;77-A;9:1380-1395.
2. Zweymuller KA, Lintner FK, Semlitsch MF. Biologic fixation of a press-fit titanium hip joint endoprosthesis. *Clin Orthop.* 1988;235:195-206.
3. Lintner F, Zweymuller KA, Brand G. Tissue reactions to titanium endo-prosthesis. *J Arthroplasty.* 1986;1;3:183-195.
4. Michelinakis E, Papapolychroniou T, Vafiadis J. The use of a cementless femoral component for the management of bone loss in revision hip arthroplasty. *Hosp for Joint Diseases.* 1996;55;1:28-32.
5. Hartwig CH, Bohm P, Czech U, et al. The Wagner revision stem in alloarthroplasty of the hip. *Arch Orthrop Trauma Surg.* 1996;115:5-9.

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The CE mark is valid only if it is also printed on the product label.

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