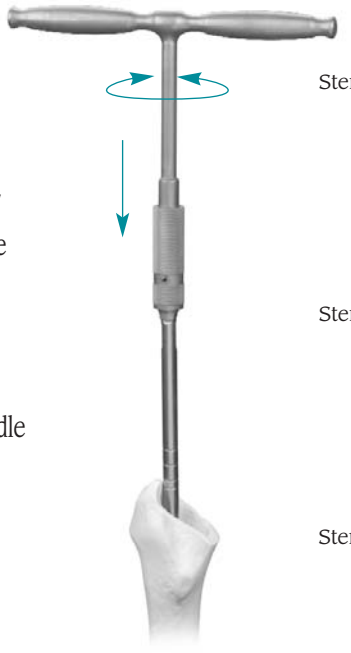
ZMR XL TAPER AND POROUS SURGICAL TECHNIQUE

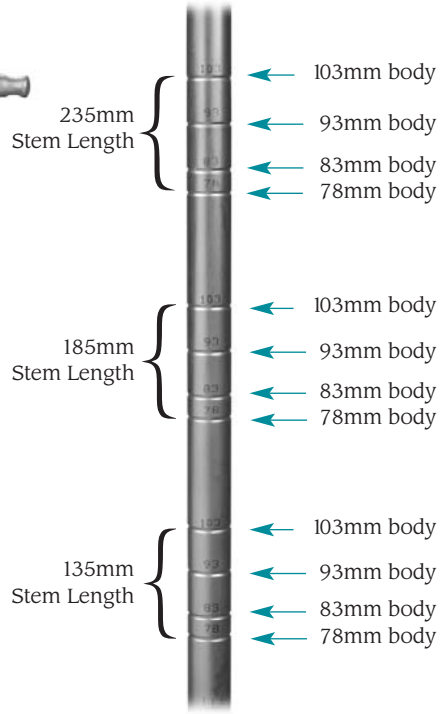
1 DISTAL CANAL PREPARATION

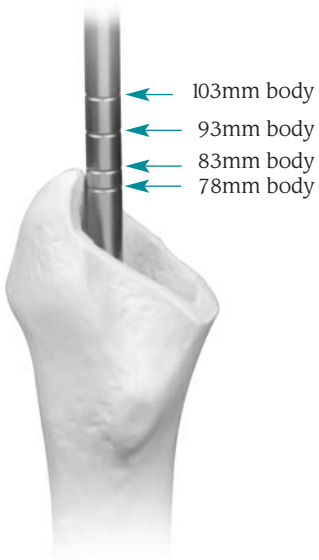
REAM DISTAL FEMUR

A. For Taper Stem

Ream the distal femur by hand using the *ZMR* XL Distal Taper Reamers. Advance the final reamer until it corresponds to the appropriate body height indication on the reamer and leave the reamer in place. Remove the T-handle and note the stem length chosen.







4 TRIAL REDUCTION

ASSEMBLE PROVISIONAL

A. For Taper Stem

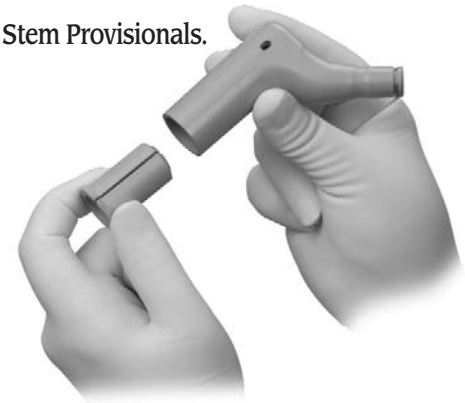
Assemble the *ZMR* XL Proximal Body Provisional and XL Stem Provisional.

Position the anterior distal tip bevel in the anterior anatomic position.

B. For Porous Stems

Insert the Adapter Sleeve into the *ZMR* XL Proximal Body Provisional, and assemble the provisional onto the appropriate Straight or Bowed Porous Stem Provisional.

Note: The *ZMR* XL Porous Adapter Sleeve is used with the standard *ZMR* Straight and Bowed Porous Stem Provisionals.



B. For Porous Straight Stem

Ream the distal femur to the appropriate size and depth using the straight intramedullary reamers.

C. For Porous Bowed Stem

Ream the distal femur to the appropriate size and depth using a flexible reamer such as the *Pressure Sentinel*® Intramedullary Reamers.

5 ASSESS POSITION IN FEMUR

For All Taper and Porous Straight Stems

Insert the provisional construct into the proximal femur. Assess component position, length, and version in femur. After locking the provisional components, perform a trial reduction.

For Porous Bowed Stem

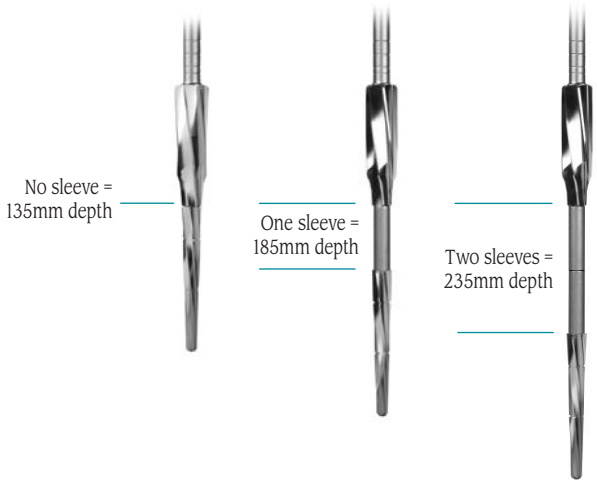
Use the Stem Alignment Guide to assess the appropriate anteversion. After locking the provisional components, perform a trial reduction.

2 PROXIMAL FEMORAL PREPARATION

PREPARE PROXIMAL REAMER

A. For Taper Stem

If necessary, place the appropriate Spacer Sleeve(s) over the distal reamer depending on the stem length selected.



B. For Porous Stems

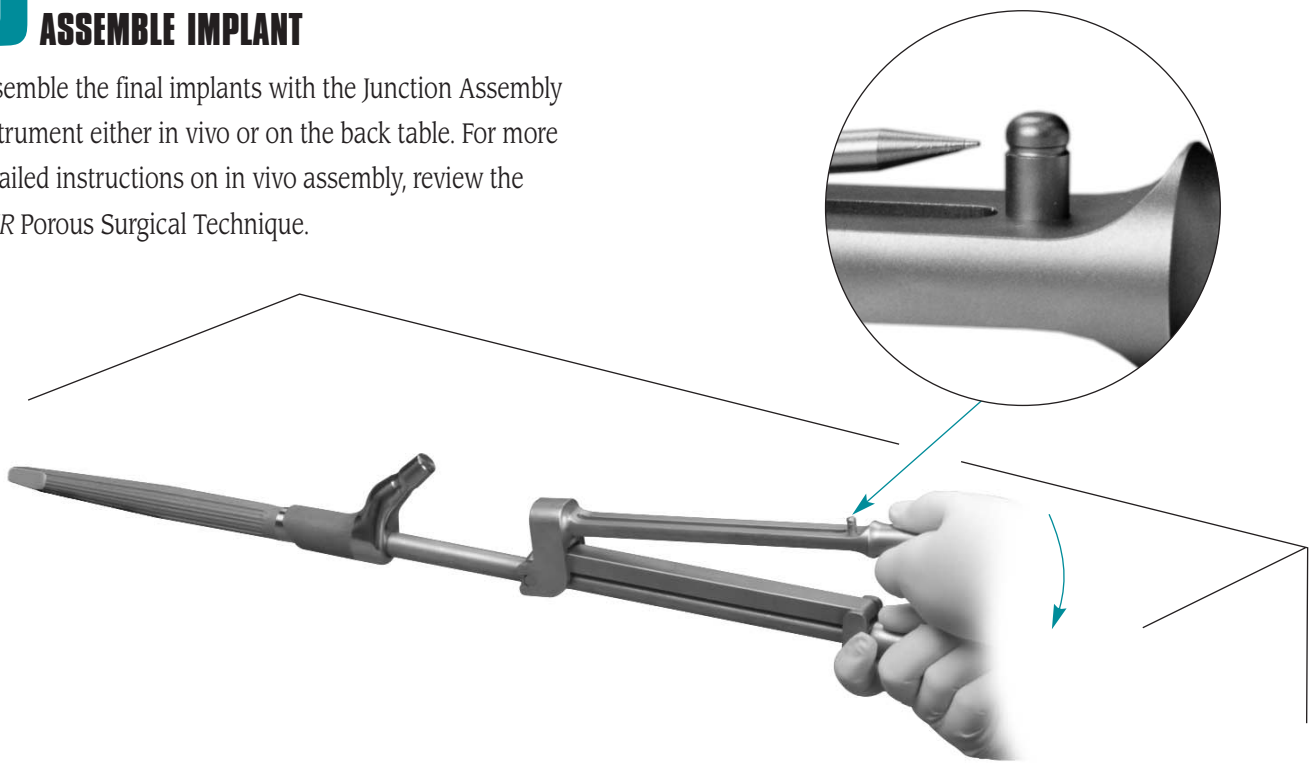
Thread the appropriate Distal Pilot onto the *ZMR* XL Porous Proximal Reamer and tighten with the Distal Pilot Wrench.

Note: Use only XL Distal Pilots.

6 IMPLANT INSERTION

ASSEMBLE IMPLANT

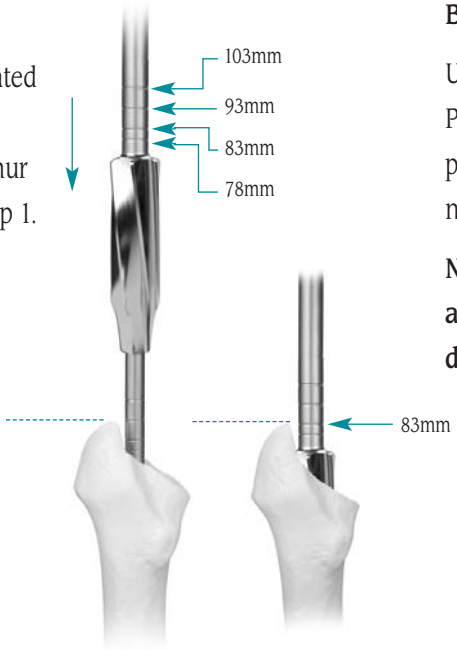
Assemble the final implants with the Junction Assembly Instrument either in vivo or on the back table. For more detailed instructions on in vivo assembly, review the *ZMR* Porous Surgical Technique.



3 REAM PROXIMAL FEMUR

A. For Taper Stem

Use the *ZMR* XL Cannulated Taper Proximal Reamer to ream the proximal femur to the depth noted in Step 1.



B. For Porous Stems

Use the *ZMR* XL Porous Proximal Reamer to ream the proximal femur to the depth noted in Step 1.

Note: Do not ream in reverse as this may disengage the distal pilot.

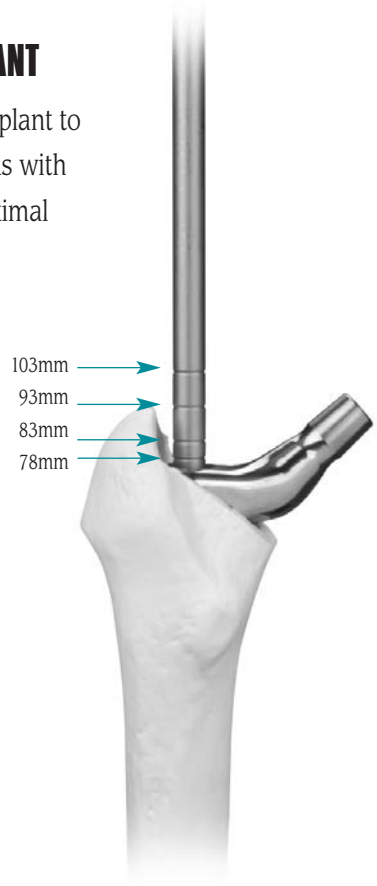
7 LOCK ASSEMBLED CONSTRUCT

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

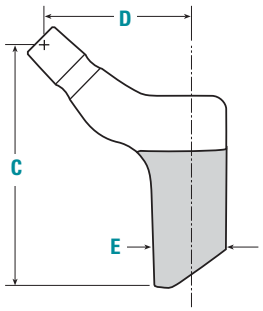
Note: Do not overtighten the Compression Nut as this could compromise its function.

8 INSERT IMPLANT

Insert the assembled implant to the appropriate depth. As with all revision surgery, proximal support is desirable.

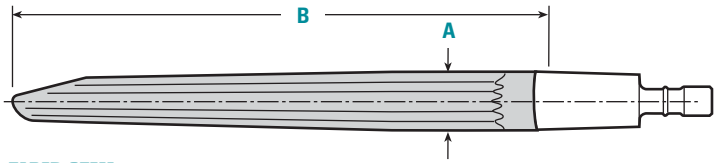


ORDER INFORMATION



ZMR XL TAPER BODY

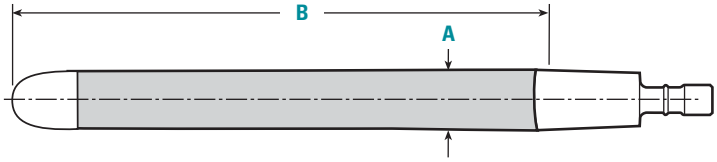
Prod. No.	Description	C Body Length (mm)	Reference to ZMR Body	D Offset (mm) When Head/Neck Component Selected is: -3.5	+0	+3.5	+7	+10.5	E Body Size (mm)
9923-78-40	78mm, XL Body, Std Offset	78	AA-	37.5	40	42.5	45	47.5	23.0
9923-83-40	83mm, XL Body, Std Offset	83	35	37.5	40	42.5	45	47.5	23.0
9923-93-40	93mm, XL Body, Std Offset	93	45	37.5	40	42.5	45	47.5	23.0
9923-103-40	103mm, XL Body, Std Offset	103	55	37.5	40	42.5	45	47.5	23.0
9923-78-45	78mm, XL Body, Ext Offset	78	AA-	42.5	45	47.5	50	52.5	23.0
9923-83-45	83mm, XL Body, Ext Offset	83	35	42.5	45	47.5	50	52.5	23.0
9923-93-45	93mm, XL Body, Ext Offset	93	45	42.5	45	47.5	50	52.5	23.0
9923-103-45	103mm, XL Body, Ext Offset	103	55	42.5	45	47.5	50	52.5	23.0



ZMR XL TAPER STEM

Prod. No.	Description	A Stem Diameter (mm)	B Stem Length (mm)
9922-17-13	XL Taper Stem, 17mm X 135mm	17	135
9922-17-18	XL Taper Stem, 17mm X 185mm	17	185
9922-17-23	XL Taper Stem, 17mm X 235mm	17	235
9922-18-13	XL Taper Stem, 18mm X 135mm	18	135
9922-18-18	XL Taper Stem, 18mm X 185mm	18	185
9922-18-23	XL Taper Stem, 18mm X 235mm	18	235
9922-19-13	XL Taper Stem, 19mm X 135mm	19	135
9922-19-18	XL Taper Stem, 19mm X 185mm	19	185
9922-19-23	XL Taper Stem, 19mm X 235mm	19	235
9922-20-13	XL Taper Stem, 20mm X 135mm	20	135
9922-20-18	XL Taper Stem, 20mm X 185mm	20	185
9922-20-23	XL Taper Stem, 20mm X 235mm	20	235
9922-21-13	XL Taper Stem, 21mm X 135mm	21	135
9922-21-18	XL Taper Stem, 21mm X 185mm	21	185
9922-21-23	XL Taper Stem, 21mm X 235mm	21	235
9922-22-13	XL Taper Stem, 22mm X 135mm	22	135
9922-22-18	XL Taper Stem, 22mm X 185mm	22	185
9922-22-23	XL Taper Stem, 22mm X 235mm	22	235
9922-23-18	XL Taper Stem, 23mm X 185mm	23	185
9922-23-23	XL Taper Stem, 23mm X 235mm	23	235
9922-24-18	XL Taper Stem, 24mm X 185mm	24	185
9922-24-23	XL Taper Stem, 24mm X 235mm	24	235

ORDER INFORMATION



ZMR XL POROUS STEM

Prod. No.	Description	A Stem Diameter (mm)	B Stem Length (mm)
9921-165-22	XL Porous Stem, 16.5 X 170mm, Straight	16.5	170
9921-165-32	XL Porous Stem, 16.5 X 170mm, Bowed	16.5	170
9921-165-33	XL Porous Stem, 16.5 X 220mm, Bowed	16.5	220
9921-165-34	XL Porous Stem, 16.5 X 260mm, Bowed	16.5	260
9921-180-22	XL Porous Stem, 18.0 X 170mm, Straight	18.0	170
9921-180-32	XL Porous Stem, 18.0 X 170mm, Bowed	18.0	170
9921-180-33	XL Porous Stem, 18.0 X 220mm, Bowed	18.0	220
9921-180-34	XL Porous Stem, 18.0 X 260mm, Bowed	18.0	260
9921-195-22	XL Porous Stem, 19.5 X 170mm, Straight	19.5	170
9921-195-32	XL Porous Stem, 19.5 X 170mm, Bowed	19.5	170
9921-195-33	XL Porous Stem, 19.5 X 220mm, Bowed	19.5	220
9921-195-34	XL Porous Stem, 19.5 X 260mm, Bowed	19.5	260
9921-210-22	XL Porous Stem, 21.0 X 170mm, Straight	21.0	170
9921-210-32	XL Porous Stem, 21.0 X 170mm, Bowed	21.0	170
9921-210-33	XL Porous Stem, 21.0 X 220mm, Bowed	21.0	220
9921-210-34	XL Porous Stem, 21.0 X 260mm, Bowed	21.0	260
9921-225-22	XL Porous Stem, 22.5 X 170mm, Straight	22.5	170
9921-225-32	XL Porous Stem, 22.5 X 170mm, Bowed	22.5	170
9921-225-33	XL Porous Stem, 22.5 X 220mm, Bowed	22.5	220
9921-225-34	XL Porous Stem, 22.5 X 260mm, Bowed	22.5	260
9921-240-22	XL Porous Stem, 24.0 X 170mm, Straight	24.0	170
9921-240-32	XL Porous Stem, 24.0 X 170mm, Bowed	24.0	170
9921-240-33	XL Porous Stem, 24.0 X 220mm, Bowed	24.0	220
9921-240-34	XL Porous Stem, 24.0 X 260mm, Bowed	24.0	260
9921-255-22	XL Porous Stem, 25.5 X 170mm, Straight	25.5	170
9921-255-32	XL Porous Stem, 25.5 X 170mm, Bowed	25.5	170
9921-255-33	XL Porous Stem, 25.5 X 220mm, Bowed	25.5	220
9921-255-34	XL Porous Stem, 25.5 X 260mm, Bowed	25.5	260

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4 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.

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9 Data on file at Zimmer

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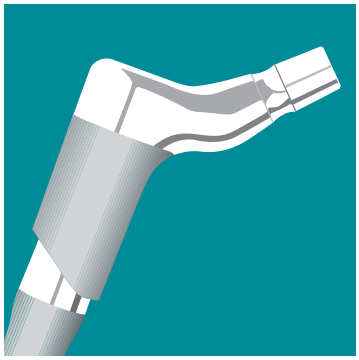

ZMR XL TAPER AND POROUS HIP PROSTHESES

Surgical Technique for Revision Hip Arthroplasty

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A MULTITUDE OF OPTIONS

The *ZMR* XL Revision Hip option is an extension of the globally successful *ZMR* Revision Hip System and has been developed to deal with the most challenging of revision hip surgeries. As with all revision hip surgery, proximal support of the implant is desirable. If the surgeon is unable to achieve proximal support, then the *ZMR* XL System, designed to accommodate cases in which proximal support cannot be achieved, should be considered. As with any femoral stem, if proximal support is not obtained, the patient should be warned of the increased risk of fatigue fracture of the stem[1], even if a *ZMR* XL construct is used.

The *ZMR* XL option includes proximal body components in a variety of heights for use with either a tapered or porous stem component to accommodate individual patient anatomies.

POROUS STEMS

The *ZMR* XL Revision Porous Stem was designed to achieve initial stem stability through intimate bone/prosthesis apposition. Stems are available in both bowed and straight designs. The stem is coated with plasma-sprayed *Tivanium*® Ti-6Al-4V Alloy to allow for bone ingrowth and biological fixation.[2-3]

Bowed porous stems are available in three lengths: 170mm, 220mm, and 260mm. A straight 170mm stem is also available. All porous stems are available in a choice of seven stem diameters, from 16.5mm to 25.5mm, in 1.5mm increments.

TAPER STEMS

The *ZMR* XL Revision Taper Stem was designed to achieve 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.[4-6]

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.[7-9]

Taper stems are available in three lengths: 135mm, 185mm, and 235mm with up to eight stem diameters, from 17mm to 24mm, are available in 1mm increments.

BODY OPTIONS

The XL proximal body is used with either *ZMR* XL Stem design, providing excellent medial fill in the femur and contributing to initial rotational stability. The bodies allow the version to be adjusted after the stem has been implanted. They are firmly locked to the stems through a taper lock and compression nut. Four body heights are available: 78mm, 83mm, 93mm, and 103mm. In addition, two offsets are available: 40mm and 45mm.

SIMPLICITY

Simple instrumentation allows a reproducible surgical technique that uses the same basic instrument set as the standard *ZMR* System.