**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.

No sleeve = 135mm depth
One sleeve = 185mm depth
Two sleeves = 235mm depth

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

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.

Note: Use only XL Distal Pilots.
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.
**ZMR XL TAPER STEM**

<table>
<thead>
<tr>
<th>Prod. No.</th>
<th>Description</th>
<th>A Stem Diameter (mm)</th>
<th>B Stem Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9922-17-13</td>
<td>XL Taper Stem, 17mm X 135mm</td>
<td>17</td>
<td>135</td>
</tr>
<tr>
<td>9922-17-18</td>
<td>XL Taper Stem, 17mm X 185mm</td>
<td>20</td>
<td>185</td>
</tr>
<tr>
<td>9922-18-18</td>
<td>XL Taper Stem, 18mm X 185mm</td>
<td>20</td>
<td>185</td>
</tr>
<tr>
<td>9922-18-23</td>
<td>XL Taper Stem, 18mm X 235mm</td>
<td>20</td>
<td>235</td>
</tr>
<tr>
<td>9922-19-13</td>
<td>XL Taper Stem, 19mm X 135mm</td>
<td>20</td>
<td>135</td>
</tr>
<tr>
<td>9922-19-18</td>
<td>XL Taper Stem, 19mm X 185mm</td>
<td>20</td>
<td>185</td>
</tr>
<tr>
<td>9922-19-23</td>
<td>XL Taper Stem, 19mm X 235mm</td>
<td>20</td>
<td>235</td>
</tr>
</tbody>
</table>

**ZMR XL TAPER BODY**

<table>
<thead>
<tr>
<th>Prod. No.</th>
<th>Description</th>
<th>C Body Length (mm)</th>
<th>Reference to ZMR Body</th>
<th>D Offset (mm) When Head/Neck Component Selected is:</th>
<th>E Body Size (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9923-78-40</td>
<td>78mm, XL Body, Std Offset</td>
<td>78</td>
<td>AA-</td>
<td>37.5</td>
<td>47.5</td>
</tr>
<tr>
<td>9923-83-40</td>
<td>83mm, XL Body, Std Offset</td>
<td>83</td>
<td>42.5</td>
<td>40</td>
<td>52.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Prod. No.</th>
<th>Description</th>
<th>C Body Length (mm)</th>
<th>Reference to ZMR Body</th>
<th>D Offset (mm) When Head/Neck Component Selected is:</th>
<th>E Body Size (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9923-83-40</td>
<td>83mm, XL Body, Ext Offset</td>
<td>83</td>
<td>42.5</td>
<td>40</td>
<td>52.5</td>
</tr>
</tbody>
</table>
### ORDER INFORMATION

---

#### ZMR XL POROUS STEM

<table>
<thead>
<tr>
<th>Prod. No.</th>
<th>Description</th>
<th>Stem Diameter (mm)</th>
<th>Stem Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9921-165-22</td>
<td>XL Porous Stem, 16.5 X 170mm, Straight</td>
<td>16.5</td>
<td>170</td>
</tr>
<tr>
<td>9921-165-32</td>
<td>XL Porous Stem, 16.5 X 260mm, Bowed</td>
<td>16.5</td>
<td>260</td>
</tr>
<tr>
<td>9921-180-22</td>
<td>XL Porous Stem, 18.0 X 170mm, Straight</td>
<td>18.0</td>
<td>170</td>
</tr>
<tr>
<td>9921-180-32</td>
<td>XL Porous Stem, 18.0 X 260mm, Bowed</td>
<td>18.0</td>
<td>260</td>
</tr>
<tr>
<td>9921-195-22</td>
<td>XL Porous Stem, 19.5 X 170mm, Straight</td>
<td>19.5</td>
<td>170</td>
</tr>
<tr>
<td>9921-195-32</td>
<td>XL Porous Stem, 19.5 X 260mm, Bowed</td>
<td>19.5</td>
<td>260</td>
</tr>
<tr>
<td>9921-210-22</td>
<td>XL Porous Stem, 21.0 X 170mm, Straight</td>
<td>21.0</td>
<td>170</td>
</tr>
<tr>
<td>9921-210-32</td>
<td>XL Porous Stem, 21.0 X 260mm, Bowed</td>
<td>21.0</td>
<td>260</td>
</tr>
<tr>
<td>9921-225-22</td>
<td>XL Porous Stem, 22.5 X 170mm, Straight</td>
<td>22.5</td>
<td>170</td>
</tr>
<tr>
<td>9921-225-32</td>
<td>XL Porous Stem, 22.5 X 260mm, Bowed</td>
<td>22.5</td>
<td>260</td>
</tr>
<tr>
<td>9921-240-22</td>
<td>XL Porous Stem, 24.0 X 170mm, Straight</td>
<td>24.0</td>
<td>170</td>
</tr>
<tr>
<td>9921-240-32</td>
<td>XL Porous Stem, 24.0 X 260mm, Bowed</td>
<td>24.0</td>
<td>260</td>
</tr>
<tr>
<td>9921-255-22</td>
<td>XL Porous Stem, 25.5 X 170mm, Straight</td>
<td>25.5</td>
<td>170</td>
</tr>
<tr>
<td>9921-255-32</td>
<td>XL Porous Stem, 25.5 X 260mm, Bowed</td>
<td>25.5</td>
<td>260</td>
</tr>
</tbody>
</table>

---

ZMR XL TAPER AND POROUS HIP PROSTHESSES

Surgical Technique for Revision Hip Arthroplasty
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\textsuperscript{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 \textit{Tivanium\textsuperscript{®} Ti-6Al-4V Alloy to allow for bone ingrowth and biological fixation.\textsuperscript{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 \textit{Tivanium Ti-6Al-4V Alloy surface allows bone ongrowth.\textsuperscript{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.\textsuperscript{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.