Zimmer®
Unicompartmental
High Flex Knee
Spacer Block
Surgical Technique
Introduction

Unicompartmental knee arthroplasty (UKA) has been shown to be an effective treatment for isolated osteoarthritis affecting the medial or lateral compartment.

Based off the successful design of the M/G® Uni, the Zimmer Unicompartmental High Flex Knee combines implant and instrument innovations with the proven design concepts of the M/G Uni to create a reproducible knee system for today’s active patient population. These innovations include an extended posterior condyle to safely accommodate high flexion, enhanced polyethylene, and a more anatomic shape to facilitate optimal implant placement.

The MIS Instruments for the Zimmer Unicompartmental High Flex Knee are designed to provide accurate, reproducible results using a minimally invasive technique. The system offers the versatility of three minimally invasive (MIS) instrumentation options:

- Spacer Block
- Intramedullary Instrumentation System (IM)
- Extramedullary Instrumentation System (EM)

This guide to the surgical technique is a step-by-step procedure written for medial compartment UKA using the most widely adopted of the three techniques, the Spacer Block.

It discusses the procedure for component sizing, bone preparation, trial reduction, cementing techniques, and component implantation. It is strongly recommended that the surgeon read the complete procedure for details, notes, and technique tips prior to the first case.
Spacer Block Surgical Technique Rationale

The basic goals of unicompartmental knee arthroplasty are to improve limb function and to reduce pain. The development of instruments specifically designed to be used through a smaller exposure has had a significant impact on the effort to minimize disruption of the surrounding soft tissue during the procedure.

Limb alignment is described by the mechanical axis of the lower extremity, which is a straight line running from the center of the femoral head to the center of the ankle. When the center of the knee lies on this mechanical axis, the knee is said to be in neutral alignment. Unicompartmental knee disease typically reduces the joint space in the affected compartment, causing a malalignment of the joint. Full correction of the malalignment would return the knee to neutral alignment (Fig. 1).

The alignment goals for unicompartmental knee arthroplasty differ from those that are customary in an osteotomy where overcorrection is desirable to displace the weight-bearing forces away from the diseased compartment. In contrast, when adjusting limb alignment in a unicompartmental procedure, it is particularly important to strive for slight undercorrection of the mechanical alignment to avoid stress in the contralateral compartment and heighten the potential for opposite compartment cartilaginous breakdown. Studies of unicompartmental procedures have shown that slight undercorrection of the limb alignment correlates to longterm survivorship.1
In UKA, varus/valgus alignment is determined by the composite thickness of the prosthetic unicompartmental components. The amount of tibial bone resection is variable while the amount of distal femoral bone resection is constant.

In the Spacer Block technique, the tibia is resected first and the femoral resection is based off the tibia cut. The tibial cutting assembly is aligned visually with the mechanical axis of the tibia, and the cut is made perpendicular to this axis.

After resecting the tibia, the 8mm Spacer Block is inserted into the joint space, only the extension gap is checked (Fig. 2). The Distal Femoral Resector is then attached to the Spacer Block, and with the knee in extension, a linked cut is made, ensuring the proximal tibia cut and distal femoral cut are parallel (Fig. 3).
Preoperative Planning

- Take standing weight-bearing A/P, lateral, and skyline radiographs of the affected knee (Fig. 4).
- A long standing A/P radiograph showing the center of the femoral head, the knee, and as much of the tibia as possible (preferably including the ankle) may also be beneficial to determine the mechanical axis.

TECHNIQUE TIP

It is important to avoid overcorrection. An additional radiograph while stressing the limits of the collateral ligaments may be helpful in assessing the maximum correction.

When evaluating the patient and planning for the procedure, consider TKA if:

- Degenerative changes are present in the contralateral compartment and/or the patellofemoral joint.
- The ACL is deficient.
- A significant flexion contracture exists.
- Slight undercorrection is not attainable.
- A significant overcorrection is likely with a valgus stress.
- There is an existing valgus or varus deformity ≥15°.

Patient Preparation

- With the patient in the supine position, test the range of hip and knee flexion. If unable to achieve 120° of knee flexion, a larger incision may be necessary to create sufficient exposure.
- Wrap the ankle area with an elastic wrap. Do not place bulky drapes on the distal tibia, ankle, or foot. A bulky drape in this area will make it difficult to locate the center of the ankle, and will displace the Tibial Resector, which may cause inaccurate cuts.
- Before surgery, mark the tibial crest, the tibial tubercle, and the second metatarsal.
Exposure

The incision can be made with the leg in flexion or extension. Make a medial parapatellar incision extending from the superior pole of the patella to about 2cm-4cm below the joint line adjacent to the tibial tubercle (Fig. 5).

Incise the joint capsule in line with the skin incision beginning just distal to the vastus medialis muscle and extending to a point distal to the tibial plateau (Fig. 6).

Excise a minimum amount of the fat pad, as necessary to facilitate visualization, being careful not to cut the anterior horn of the lateral meniscus. Reflect the soft tissue subperiosteally from the tibia along the joint line back towards, but not into, the collateral ligament.

Excise the anterior third of the meniscus. The remainder of the meniscus will be removed after bone resection. A subperiosteal dissection should be carried out towards the midline, ending at the patellar tendon insertion. This will facilitate positioning of the tibial cutting guide.

Debride the joint and inspect it carefully. Remove intercondylar osteophytes to avoid impingement with the tibial spine or cruciate ligament. Also, remove peripheral osteophytes that interfere with the collateral ligaments and capsule. With medial compartment disease, osteophytes are commonly found on the lateral aspect of the medial tibial eminence and anterior to the origin of the ACL. Final debridement will be performed before component implantation.
# Table of Contents

<table>
<thead>
<tr>
<th>SECTION</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Resect the Proximal Tibia</td>
<td>1</td>
</tr>
<tr>
<td>Use the Spacer Block to Verify Tibia Cut</td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Resect the Distal Femoral Condyle</td>
<td>8</td>
</tr>
<tr>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Check the Flexion/Extension Gap</td>
<td>10</td>
</tr>
<tr>
<td>Recutting the Distal Femur and Tibia (Optional)</td>
<td>11</td>
</tr>
<tr>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>Size the Femur</td>
<td>13</td>
</tr>
<tr>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>Finish the Femur</td>
<td>15</td>
</tr>
<tr>
<td>6</td>
<td>18</td>
</tr>
<tr>
<td>Size the Tibia</td>
<td>18</td>
</tr>
<tr>
<td>7</td>
<td>20</td>
</tr>
<tr>
<td>Finish the Tibia</td>
<td>20</td>
</tr>
<tr>
<td>8</td>
<td>21</td>
</tr>
<tr>
<td>Perform Trial Reduction</td>
<td>21</td>
</tr>
<tr>
<td>9</td>
<td>23</td>
</tr>
<tr>
<td>Implant Final Components and Close Incision</td>
<td>23</td>
</tr>
</tbody>
</table>
Resect the Proximal Tibia

The Zimmer Unicompartmental High Flex Knee System is designed for an anatomic tibia position with a 5° posterior slope. The tibial assembly consists of a Tibial Resector, a Tibial Resector Base, a Tibial Resector Stem, a Distal Telescoping Rod, and an Ankle Clamp. It is important that the tibial resector is positioned properly to ensure an accurate tibial cut (Fig. 7).

TECHNIQUE TIP 1.A
All landmarks should be marked before attaching instruments.

- Slide the Ankle Clamp onto the dovetail at the bottom of the Distal Telescoping Rod, and tighten the knob opposite the dovetail to hold the clamp in place (Fig. 8).

TECHNIQUE TIP 1.B
The Tibial Resector Stem is available in two sizes to accommodate different tibial lengths. The short stem is most commonly used.

- Insert the appropriate length Tibial Resector Stem into the proximal end of the Distal Telescoping Rod and tighten the knob. Attach the appropriate Tibial Resector to the corresponding Tibial Resector Base (Fig. 9).

Instruments

- Tibial Resector 5°
  00-5843-021-00 LM/RL
  00-5843-022-00 LL/RM
- Tibial Resector Base
  00-5843-021-02 LM/RL
  00-5843-022-02 LL/RM
- Tibial Resector Stem
  00-5843-024-00 Long
  00-5843-023-00 Short
- Distal Telescoping Rod
  00-5843-026-00
- Ankle Clamp
  00-5997-070-00
Establish the Tibial Platform

SECTION 1

Loosen the knob that provides mediolateral adjustment of the Distal Telescoping Rod. Adjust the guide so the distal end of the rod lies directly over the tibial crest and the proximal portion lies parallel to the mechanical axis of the tibia. Tighten the knob to secure the position of the guide (Fig. 10d).

Resect the Proximal Tibia

TECHNIQUE TIP 1.C

The resector and base are available in two configurations: Left MED/Right LAT and Right MED/Left LAT.

- Attach the appropriate Tibial Resector to the corresponding Tibial Resector Base. Slide the dovetail on the Tibial Resector Base onto the proximal end of the Tibial Resector Stem and tighten the knob on the stem. The dovetail provides a slide adjustment that allows M/L positioning (Fig. 10a).

TECHNIQUE TIP 1.D

Ensure that the Tibial Resector is not threaded all the way down into the Tibial Resector Base so that the tibial resection can be fine tuned.

- Secure the distal portion of the assembly by placing the spring arms of the Ankle Clamp around the ankle proximal to the malleoli (Fig. 10b).

- Loosen the knob at the top of the Distal Telescoping Rod. Position the Tibial Resector proximal to the tibial tubercle with the cutting slot at the approximate desired level of resection, then retighten the knob (Fig. 10c).

- Loosen the knob that provides mediolateral adjustment of the Distal Telescoping Rod. Adjust the guide so the distal end of the rod lies directly over the tibial crest and the proximal portion lies parallel to the mechanical axis of the tibia. Tighten the knob to secure the position of the guide (Fig. 10d).

Instruments

- Tibial Resector 5°
  00-5843-021-00 LM/RL
  00-5843-022-00 LL/RM

- Tibial Resector Base
  00-5843-021-02 LM/RL
  00-5843-022-02 LL/RM

- Tibial Resector Stem
  00-5843-023-00 Short
  00-5843-024-00 Long

- Distal Telescoping Rod
  00-5843-026-00

- Ankle Clamp
  00-5997-070-00
Resect the Proximal Tibia

- Use the proximal M/L slide adjustment at the midshaft of the assembly to position the fixation arm of the Tibial Resector Base and Tibial Resector so it lies just medial to the midpoint of the tibial tubercle and is in line with the center of the intercondylar eminence (Fig. 11).

- In the sagittal plane, align the assembly so it is parallel to the anterior tibial shaft by using the A/P slide adjustment at the distal end of the Distal Telescoping Rod. Tighten the knob for the adjustment (Fig. 12).

TECHNIQUE TIP 1.E
If there is a bulky bandage around the ankle, adjust the assembly to accommodate the bandage to aid in cutting the tibia in the proper slope.

TECHNIQUE TIP 1.F
If the patient has a slight flexion contracture, cutting less posterior slope will result in less bone resection posteriorly than anteriorly, thereby opening the extension gap more relative to the flexion gap.

Instruments

- Tibial Resector 5° 00-5843-021-00 LM/RL 00-5843-022-00 LL/RM
- Tibial Resector Base 00-5843-021-02 LM/RL 00-5843-022-02 LL/RM
- Tibial Resector Stem 00-5843-024-00 Long 00-5843-023-00 Short
- Distal Telescoping Rod 00-5843-026-00
- Ankle Clamp 00-5997-070-00
Resect the Proximal Tibia

SECvement the Tibial Platform

• Lower the cut slot using the thumb screw on the Tibial Resector Base so that the tip of the stylus rests in the deepest defect on the tibial plateau (Fig. 15). The cut will remove 2mm or 4mm of bone below the tip of the stylus.

Secure the Assembly

• Insert a 48mm Headed Screw, or predrill and insert a Holding Pin, through the hole in the fixation arm of the Tibial Resector Base (Fig. 13).

TECHNIQUE TIP 1.6

Do not completely seat the screw/pin until the final adjustments have been made to the position of the Tibial Resector.

TECHNIQUE TIP 1.H

To minimize the number of screw/pin holes in the bone, avoid repositioning the screw/pin by confirming the appropriate position of the guide before inserting the screw/pin.

• Insert the stylus into the hole on the top of the Tibial Resector and gently tighten the screw (Fig. 14).

• Insert the stylus 2/4mm

00-5843-029-00

Tibial Resection Stylus 2/4mm

00-5843-021-00 LM/RL

00-5843-021-02 LM/RL

00-5843-022-00 LL/RL

00-5843-022-02 LL/RL

Tibial Resector 5°

00-5843-021-00 LM/RL

00-5843-021-02 LM/RL

00-5843-022-00 LL/RL

00-5843-022-02 LL/RL

Tibial Resector Base

00-5843-024-00 Long

00-5843-023-00 Short

Tibial Resector Stem

00-5791-041-00

Headed Screw 48mm

00-5791-041-00

Instruments
• Secure the Tibial Resector to the proximal tibia by inserting a 48mm Headed Screw or predrilling and inserting a Gold Headless Holding Pin (Fig. 16).

• Use electrocautery or the reciprocating saw to score the tibial surface where the sagittal cut will be made (Fig. 17).
The Transverse Cut

- Insert a retractor medially to protect the medial capsular structures, and flex the knee.
- Use a 1.27mm (0.050-inch) oscillating saw blade through the slot in the cutting guide to make the transverse cut. The Tibial Resector must remain against the bone during resection. Be careful to avoid undercutting the tibial spine (Fig. 18).

**TECHNIQUE TIP 1.J**

Do not use a saw blade with a thickness of less than 1.27mm to avoid inaccurate cuts.

The Sagittal Cut

- Flex the knee and use a reciprocating blade to make the sagittal cut at the base of the tibial eminence (Fig. 19).
- Cut along the edge of the ACL down to, but not beyond, the level of the transverse cut. Be careful to avoid the ACL attachment.

**TECHNIQUE TIP 1.J**

To help avoid possible damage to the surrounding anatomy, a single-sided reciprocating blade can be used for the sagittal cut.

Instruments

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tibial Resector Base</td>
<td>00-5843-021-02 LM/RL</td>
</tr>
<tr>
<td></td>
<td>00-5843-022-02 LL/RM</td>
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<td>Tibial Resector 5°</td>
<td>00-5843-021-00 LM/RL</td>
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<tr>
<td></td>
<td>00-5843-022-00 LL/RM</td>
</tr>
<tr>
<td>Headed Screw 48mm</td>
<td>00-5791-041-00</td>
</tr>
<tr>
<td>Gold Headless Holding Pin</td>
<td>00-5791-042-00</td>
</tr>
</tbody>
</table>
Resect the Proximal Tibia

Use the Spacer Block to Verify the Tibia Cut

• Remove the Tibial Resector but leave the tibial assembly in place. Check the extension gap with the 8mm spacer block to ensure the tibial resection is sufficient (Fig. 20).

• If the 8mm Spacer Block is too loose, use a thicker Spacer Block.

• If the 8mm Spacer Block is too tight, reattach the Tibial Resector and use the thumb screw to dial down the level of resection 1mm to 2mm and recut the proximal tibia.

• Optionally, the tibial assembly can be removed and the 2mm recutter (referenced on page 11) may be used to recut the proximal tibia.

Verify Alignment

• Attach the Alignment Tower to the Spacer Block and insert the Alignment Rod through the Alignment Tower (Fig. 21).

• Insert the Targeting Guide onto the Alignment Rod, and position the guide relative to the femoral head to check alignment.

• When the tibia preparation is complete, remove the tibial assembly.

Instruments

Spacer Block 5° 8/10/12/14mm 00-5843-030-08/10/12/14
Headed Screw 48mm 00-5791-041-00
Spacer Block Alignment Tower 00-5843-032-00
Alignment Rod 00-5785-079-00
Targeting Guide 00-5843-028-00
Tibial Resector Base 00-5843-021-02 LM/RL 00-5843-022-02 LL/RM
Resect the Distal Femoral Condyle

- Fully extend the knee, and insert the appropriate size Spacer Block into the joint space until the anterior stop contacts the anterior tibia (Fig. 22).

TECHNIQUE TIP 2.A
The Spacer Block must be fully inserted and sit flat on the resected tibial surface to ensure that the proper amount of femoral bone will be resected.

- Insert a 48mm Headed Screw or predrill and insert a Short-head Holding Pin into the anterolateral angled hole in the Spacer Block (Fig. 23).

Instruments

Spencer Block 5°
8/10/12/14mm
00-5843-030-08/10/12/14

Headed Screw 48mm
00-5791-041-00
Resect the Distal Femoral Condyle

**TECHNIQUE TIP 2.B**

*Since the Zimmer Unicompartmental High Flex Knee System has been designed for 5° of posterior tibia slope, the handle of the Spacer Block is angled 5° relative to the Spacer Block. This ensures that the distal femoral resection is made perpendicular to the mechanical axis of the femur.*

- Place the Distal Femoral Resector over the handle of the Spacer Block (Fig. 24).

- Secure the guide by inserting a 48mm Headed Screw or predrill and insert a Holding Pin through the hole (Fig. 25).

**TECHNIQUE TIP 2.C**

*Be sure that the Spacer Block is fully inserted in the joint and the cut slot is centered on the femoral condyle to help ensure that the screw/pin achieves appropriate purchase in the bone.*

- Use a 1.27mm (0.050-inch) oscillating saw blade to resect the distal femur (Fig. 26).

*Note: To avoid damaging the posterior popliteal area, do not extend the saw blade posteriorly past the distal femur while the leg is held in extension.*

**Instruments**

- Spacer Block 5° 8/10/12/14mm 00-5843-030-08/10/12/14
- Headed Screw 48mm 00-5791-041-00
- Spacer Block Femoral Resector 00-5843-033-02
Check the Flexion/Extension Gap

- Flexion/Extension Gap Spacers are available in 8mm, 10mm, 12mm, and 14mm thicknesses.
- The thick end of each spacer duplicates the combined thickness of the corresponding tibial and femoral components in extension (Fig. 27).
- The thin end of each spacer simulates the thickness of the tibial component in flexion (Fig. 28).

**TECHNIQUE TIP 3.A**

It may be helpful to slightly flex the knee when checking the extension gap to avoid a false sense of tightness.

Flexion/Extension Gap Decision Point

- If the 8mm Flexion/Extension gap spacer is tight in flexion and extension, refer to page 11 to recut the proximal tibia or distal femur.
- If the joint space is loose in flexion and extension, insert the next gap spacer thickness and repeat the gap checking.
- If tight in extension and acceptable in flexion, two options may be pursued:
  - **Option 1:** Recut the proximal tibia with less tibial slope
  - **Option 2:** Recut the distal femoral condyle.

**TECHNIQUE TIP 3.B**

Verifying the Extension gap at this stage of the procedure will reduce the likelihood of a gap imbalance during the trial reduction.

Instruments

Flexion/Extension Gap
Spacer 8/10/12/14mm
00-5843-035-08/10/12/14
Optional Technique

The 2mm Recutter is designed to remove an additional 2mm of bone from either the medial or lateral compartment on the tibia or femur.

Recutting the Tibia

- Apply the 2mm Recutter to the tibia parallel to the sagittal cut and with the cutting slot facing anteriorly. Ensure that the guide is flat against the resected surface.
- Secure the guide by inserting two 48mm Headed Screws through the holes in the guide (Fig. 29).

TECHNIQUE TIP 3.C

The original tibial bone piece can be measured to determine the amount of bone taken with the first tibial resection.

- Use an oscillating saw with a 1.27mm (0.050-inch) blade to cut the tibia through the slot in the 2mm Recutter (Fig. 30).

TECHNIQUE TIP 3.D

Be careful to avoid undercutting the sagittal cut.

- Use the Flexion/Extension Gap Spacers to recheck the gaps (Fig. 31).

Instruments

- Headed Screw 48mm
  00-5791-041-00
- ZUK 2mm Recutter
  00-5843-056-00
- Flexion/Extension Gap Spacer 8/10/12/14mm
  00-5843-035-08/10/12/14
Recutting the Distal Femur

- If the knee felt good in extension and flexion prior to cutting the distal femur and now is tight in extension, then the femur may need to be recut.
- Apply the 2mm Recutter to the femoral condyle so it is flat against the resected surface. Position the guide as anterior as possible, and at an angle that will avoid the anterior cruciate ligament, the patellar tendon, and the uninvolved femoral condyle (Fig. 32).
- Secure the guide by inserting two 48mm Headed Screws through the holes in the guide (Fig. 33).

- Use an oscillating saw with a 1.27mm (0.050-inch) blade to cut the femoral condyle through the slot in the 2mm Recutter. Check to ensure that the resected surface is flat (Fig. 34).

- Use the Flexion/Extension Gap Spacers to recheck the gaps (Fig. 35).

**TECHNIQUE TIP 3.E**
The 2mm recutter is NOT intended for use on a finished femur.

**Instruments**
- Headed Screw 48mm 00-5791-041-00
- ZUK 2mm Recutter 00-5843-056-00
- Flexion/Extension Gap Spacer 8/10/12/14mm 00-5843-035-08/10/12/14
Size the Femur

There are seven sizes of femoral implants (lefts and rights) and corresponding sizes of Femoral Sizer/Finishing Guides. The outside contour of the Femoral Sizer/Finishing Guides matches the contour of the corresponding implant.

- Insert the prongs on the Insertion Handle into the corresponding holes of the appropriate Femoral Sizer/Finishing Guide (Fig. 36).

- Thread the handle into the guide and tighten it securely (Fig. 37).
Insert the foot of the guide into the joint and rest the flat surface against the cut distal condyle (Fig. 38).

Pull the foot of the guide anteriorly until it contacts the cartilage/bone of the posterior condyle.

**TECHNIQUE TIP 4.A**

"Be sure that there is no soft tissue or remaining osteophytes between the Femoral Sizer/Finishing Guide and the cut distal condyle. Any gaps between the guide and the bone will compromise the accuracy of the cuts."

There should be 2mm - 3mm of exposed bone above the anterior edge of the guide (Fig. 39).

Repeat with additional guides until the proper size is selected.

**TECHNIQUE TIP 4.B**

"If the condyle appears to be between two sizes, choose the smaller size. This prevents anterior overhang which can lead to patellar impingement."

---

**Instruments**

Femoral Sizer/
Finishing Guide
00-5843-01x-01 LM/RL
00-5843-01x-02 LL/RM
FINISH THE FEMUR

With the proper size Femoral Sizer/Finishing Guide in position, insert a 48mm Headed Screw into the top pin hole, or predrill and insert a Holding Pin (Fig. 40).

- Rotate the guide on the screw/pin until the posterior edge of the guide is parallel to the cut surface of the tibia (Fig. 41).
- Make sure there is exposed bone on both sides of the guide to ensure that the Femoral Sizer/Finishing Guide does not overhang.
- Insert one 33mm Headed Screw (gold head) into the angled anterior pin hole, which is parallel to the chamfer cut (Fig. 42).

TECHNIQUE TIP 5.A

The 48mm Headed Screw may be used in place of the 33mm Headed Screw (gold head) for additional fixation on femoral finishing guide sizes G and F.

TECHNIQUE TIP 5.B

For best fixation, seat the screw head slowly. This should stabilize the guide sufficiently to finish the femur.

Instruments

Femoral Sizer/Finishing Guide
00-5843-01x-01 LM/RL
00-5843-01x-02 LL/RM

Headed Screw 48mm
00-5791-041-00

Headed Screw 33mm (gold head)
00-5791-044-00
• Insert the Femoral Drill w/ Stop into the anterior post hole and drill the anterior peg hole (Fig. 43).

**TECHNIQUE TIP 5.C**

*Insert the femoral holding peg into the anterior peg hole for additional fixation.*

• Drill the posterior post hole in the same manner. This hole is angled the same as the anterior post hole (Fig. 44).

**TECHNIQUE TIP 5.D**

*A reciprocating saw can also be used to cut the posterior chamfer.*

• Remove the anterior Femoral Holding Peg and cut the posterior chamfer through the cutting slot in the guide (Fig. 45).

**TECHNIQUE TIP 5.E**

*If a screw/pin was inserted into the middle hole, either remove the pin or cut around it. The remaining island of bone can then be resected after removing the Femoral Sizer/Finishing Guide.*

**Instruments**

- Femoral Sizer/Finishing Guide
  - 00-5843-014-01 LM/RL
  - 00-5843-014-02 LL/RM

- Headed Screw 48mm
  - 00-5791-041-00

- Headed Screw 33mm (gold head)
  - 00-5791-044-00

- Precoat Femoral Drill w/Stop
  - 00-5843-018-00

- Femoral Holding Peg
  - 00-5789-046-00
• Cut the posterior condyle through the cutting slot in the guide (Fig. 46).

• Remove the Femoral Sizer/Finishing Guide and ensure that all surfaces are flat.

• If any prominent spurs or osteophytes are present, especially in the area of the superior posterior femoral condyle, remove them with an oscillating saw or an osteotome, as they could inhibit flexion or extension (Fig. 47).

**TECHNIQUE TIP 5.F**

The Femoral Provisional may be put in place and the knee flexed to help identify and remove any residual posterior condylar bone which could limit flexion.

**Instruments**

- Femoral Sizer/Finishing Guide
  - 00-5843-01x-01 LM/RL
  - 00-5843-01x-02 LL/RM

- Headed Screw 48mm
  - 00-5791-041-00

- Headed Screw 33mm (gold head)
  - 00-5791-044-00
Size the Tibia

- Resect the remaining meniscus and remove any osteophytes, especially those interfering with the collateral ligament.
- Select the Tibial Sizer that best covers the resected proximal tibia in both the A/P and the M/L dimensions.
- Place the head of the Tibial Sizer on the cut surface of the tibia with the straight edge against the surface created by the sagittal cut (Fig. 48).

TECHNIQUE TIP 6.A

The resected tibial bone fragment can be used as an aid in sizing.

- The Tibial Sizer has a sliding ruler which facilitates measuring in the A/P dimension (Fig. 49).

- Pull the Tibial Sizing Slider anteriorly until the hook on the tip of the slider contacts the posterior edge of the tibia (Fig. 50).

Instruments

- Tibial Sizer
  - 00-5843-041-0x
- Tibial Sizer Slider
  - 00-5843-042-00
• The A/P size of the tibia can be referenced using the etch marks on the handle of the Tibial Sizer and the line on the Tibial Sizer Slider (Fig. 51).

• The Tibial Sizer Slider extends beyond the handle of Tibial Sizer and can be used to reference the amount of exposed posterior bone behind the Tibial Sizer (Fig. 51).

• Once the correct size is chosen, the location of the rotational fin on the tibial implant can be marked through the cut out on the straight edge of the tibial sizer (Fig. 52).

• Remove the tibial sizer and all soft tissue debris from the posterior region.

**TECHNIQUE TIP 6.B**

To facilitate insertion of the Tibial Fixation Plate Provisional, internally rotate the tibia while the knee is flexed.

**Instruments**

- Tibial Sizer 00-5843-041-0x
- Tibial Sizer Slider 00-5843-042-00
- Tibial Baseplate Provisionals 00-5841-00x-01 LM/RL 00-5841-00x-02 LL/RM
Finish the Tibia

- Place the corresponding size Tibial Baseplate Provisional onto the cut surface of the tibia.
- Insert the Tibial Plate Impactor into the recess on the provisional and impact it so the rotational fin engages the bone and the provisional sits flush on the tibial surface (Fig. 53).

**TECHNIQUE TIP 7.A**

In hard bone, a reciprocating saw may be used to create the hole for the rotational fin.

- Insert a Short-headed Holding Pin into the anterior fixation hole of the tibial baseplate provisional (Fig. 54).

- Use the Tibial Drill with Stop to drill the two tibial peg holes (Fig. 55).

**TECHNIQUE TIP 7.B**

The tibial peg holes are angled 20 degrees posteriorly to facilitate drilling.

- Leave the Tibial Baseplate Provisional in place to perform trial reduction.

**Instruments**

- Tibial Baseplate Provisionals 00-5841-00x-01 LM/RL 00-5841-00x-02 LL/RM
- Short-Head Holding Pin 17mm 00-5977-056-02
- Tibial Drill w/Stop 00-5789-049-00
- Tibial Tray Impactor 00-5791-035-00
- Mallet 00-0155-002-00
Perform Trial Reduction

With all bone surfaces prepared, perform a trial reduction with the appropriate size Femoral Provisional, Tibial Baseplate Provisional, and Tibial Articular Surface Provisional.

- Insert the prongs on the Insertion Handle into the corresponding holes on the Femoral Provisional. Thread the handle into the provisional and tighten it securely (Fig. 56).

- In flexion, insert the long post first. Impact the provisional onto the femur with a mallet (Fig. 57).
• Slide the rails on the bottom of the Tibial Articular Surface into the grooves on the Tibial Baseplate Provisional (Fig. 58).
• Check for proper range of motion and ligament stability.

• Evaluate soft tissue tension in flexion and extension using the 2mm end of the Tension Gauge to help ensure that flexion and extension gaps are not too tight (Fig. 59).
Implant Final Components

- Obtain the final components. Taking into account space constraints, if using a modular tibial component, implant the tibial component first. If using an all-polyethylene tibial component, implant the femoral component first.

**TECHNIQUE TIP 9.A**

*If the resected surfaces of the tibia and/or femur are sclerotic, drill multiple holes with a small drill (2.0mm-3.2mm) to improve cement intrusion.*

Tibial Component

- To facilitate insertion, flex the knee and externally rotate the tibia.

**TECHNIQUE TIP 9.B**

*To collect cement behind the tibia, a slightly moist sterile gauze can be placed behind the tibia before implanting the components.*

- Apply cement and press the tibial baseplate on the tibia.
- Press down on the posterior portion of the tibial component first to force excess cement anteriorly. Then press down on the anterior portion of the component.
- If inserting a modular tibial component, use the Tibial Plate Impactor to impact the tibial base plate (Fig. 60).
- If using an all-polyethylene tibial component, insert the Tension Gauge into the joint and extend the knee. This will apply sufficient pressure to fully seat the component.

**Note:** Do not use the Tibial Plate Impactor to impact an all-polyethylene tibial component.

- If a sterile gauze was used, remove it slowly from behind the tibia and use the Cement Removal Tool to remove any excess cement.

**Instruments**

- Tibial Tray Impactor
  - 00-5791-035-00
- Mallet
  - 00-0155-002-00
- Cement Removal Tool
  - 00-5061-084-00
Femoral Component

- Apply cement and begin the femoral component insertion with the leg in deep flexion.
- Insert the long post first and adjust the leg to a midflexion position, and seat the component with the Femoral Impactor (Fig. 61).

Tibial Articular Surface

- After the cement has cured, remove any remaining excess cement before the final placement of the tibial articular surface.

Note: Do not proceed with locking the final articular surface component until the cement has fully cured.

- Snap the disposable Articular Surface Inserter Tip onto the Tibial Articular Surface Inserter.
- With the engraved side down, slide the edge of the polyethylene component under the posterior lip of the base plate.
- Insert the tab on the lower jaw of the Tibial Articular Surface Inserter into the notch on the front of the tibial base plate.
- Bring the polyethylene tip on the upper jaw of the inserter down until it contacts the articular surface implant. Squeeze the handles of the inserter together until the articular surface implant snaps into place (Fig. 62).

Closure

- Irrigate the knee for the final time and close. Cover the incision with a sterile dressing and wrap the leg with an elastic bandage from the toes to the groin.
References


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