ZUK Patient Specific Instruments
Unicompartmental High Flex Knee
Surgical Technique

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Introduction

Unicompartmental knee arthroplasty (UKA) has been shown to be an effective treatment for isolated osteoarthritis. This guide to the surgical technique is a step-by-step procedure written for medial compartment UKA using Materialise PSI guides for use with the ZUK implant. It is strongly recommended that the surgeon read the complete procedure for details, notes, and technique tips prior to the first case.

Exposure

Perform a standard ZUK Unicompartmental knee incision (see ZUK Unicompartmental High Flex Knee Spacer Block Surgical Technique for reference).

Remove at least the anterior half of the medial meniscus and expose the anterior portion of the medial plateau. Any remaining meniscus will be removed after the tibia bone resection.

Do not remove any osteophytes from the femur or tibia.

Remove any soft tissue that may prevent proper placement of the femoral or tibia guide.

Indications

Unicompartmental knee implants are indicated for restoring either compartment of a knee that has been affected by the following:

1. Noninflammatory degenerative joint disease including osteoarthritis, traumatic arthritis, or avascular necrosis;
2. Correction of functional deformity;
3. Revision procedures where other treatments or devices have failed; and
4. Treatment of fractures that are unmanageable using other techniques.

Unicompartmental knee implants are single use only and are intended for implantation only with bone cement.

Contraindications

1. Cases where there is poor bone stock which would make the procedure unjustifiable.
2. Active, local infection or previous intra-articular infections.
3. Mental or neurologic conditions that tend to pre-empt the patient’s ability or willingness to restrict activities.
4. Neuropathic (Charcot) joint.
5. Conditions that tend to place increased loads on implants such as age, weight, and activity level, which are incompatible with a satisfactory long-term result.
6. Collateral ligament insufficiency (except in cases where a constrained knee system is indicated and used).
7. Skeletal immaturity.
8. Use of a supracondylar nail through intercondylar notch of PROFIX® primary femoral components.
9. Use of slotted femoral and tibial stems without adequate bone support.
Tibial Surgical Technique

Position the tibia cut guide on medial tibia plateau while holding the guide using downward pressure (Fig. 1).

**Technique tip:** Dry the tibial plateau before positioning the tibia cut guide.

**Technique tip:** Externally rotating the tibia will expose more of the proximal surface and reduce any interference with the femur.

Verify a unique and stable fit of the cut guide on the tibia. Apply pressure on top of the tibia guide to hold in position. Verify contact with bone through the windows and around the contact surface of the guide (Fig. 2).

Place a Headless Trocar Drill Pin through the hole in the sagittal cut slot (Fig. 3). Verify the guide location has not changed. Check the bone contact through the windows and around the perimeter of the guide.

**Technique tip:** It is recommended that one person hold the guide to ensure the least amount of movement while a second person drills.

**Technique tip:** Use caution when inserting the pin to avoid exiting the bone posteriorly.

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Zimmer Uni PSI
Tibia Cut Guide
00-5970-000-04

MIS Screw Inserter/Extractor
00-5983-049-00

Headless Trocar Drill Pin
00-5901-020-00
Tibial Surgical Technique

Insert a 48mm headed screw through the center hole (Fig. 4a). Then insert a 48mm headed screw through the medial hole. Verify the guide did not move while placing the headed screws (Fig. 4b).

**Technique tip:** Do not over torque the headed screws, this can lead to movement of the guide position. Reduce speed when the screw head is nearly seated against the guide.

**Technique tip:** A 33mm headed screw may be used for the medial hole depending on the tibia size.
Slide the ZUK Uni Alignment Tower onto the tibia guide to check the alignment of the planned proximal cut with the drop rod. The rod should be parallel with the tibia crest in the frontal plane (Fig. 5).

**Technique tip:** In order to maintain guide stability, it is recommended to perform the proximal cut first.

Perform the proximal cut through the proximal tibia cut slot using a narrow oscillating saw (1.27mm thick, 12.5mm wide) (Fig. 6). The saw blade will make contact with the Trocar Drill Pin on the lateral side. Do not insert the saw blade more posteriorly than the pre-operatively planned saw blade excursion depth.

**Technique tip:** The PSI report will display the saw blade excursion depth and can be monitored when using an oscillating saw with depth markings.
Tibial Surgical Technique

Perform the sagittal cut through the sagittal tibia cut slot using a reciprocating saw (1.19mm thick saw blade). The blade will stop on the Trocar Drill Pin at the distal end of the cut (Fig. 7).

Remove the Trocar Drill Pin, 48mm screw and the cut guide from the tibia.

Remove the medial tibia plateau. If required, complete the proximal cut to ensure complete removal of tibia plateau.
Femoral Surgical Technique

Position the femoral guide on the medial femoral condyle with the knee in approximately 45 degrees of flexion. Apply posterior pressure to the femoral cut guide and verify the unique and stable fit of the cut guide. Verify contact with bone through the windows and around the contact surface of the guide (Fig. 8).

**Technique tip:** Dry the femoral condyle surface before positioning the femoral guide.

Extend the femur to full extension. Insert the tension guide (2mm or 3mm) between the femoral guide and the tibia cut to hold axial pressure and keep the guide in full contact with the bone.

**Note:** The tension may vary depending on the laxity of the soft tissues.

Verify the fit of the cut guide. Then insert a 48mm headed screw through the lateral hole (Fig. 9).

Insert a 48mm headed screw through the medial hole. Verify the guide did not move while placing the fixation screws.

**Technique tip:** The lateral femoral surface should be fixated first to minimize movement.

**Technique tip:** It is recommended that one person hold the guide to ensure the least amount of movement while a second person drills. Apply pressure on the distal and anterior positions of the guide.

**Technique tip:** Do not over torque the headed screw, this can lead to movement of the guide position. Reduce speed when the screw head is nearly seated against guide.
Femoral Surgical Technique

Remove the tension gauge and flex the knee slightly.

Ensure the femoral guide has not moved and is in contact with the bone through the window.

Drill through the distal rotation pin cylinder with a 3.2mm drill bit (Fig. 10). Do not insert the pin into the rotation hole.

Fig. 10
Extend the knee with the femoral guide in position.

Insert the tension gauge (2mm or 3mm) in the joint space between the proximal cut and distal surface of the femoral guide.

**Note:** The tension may vary depending on the laxity of the soft tissues (Fig. 11).

Compress the knee joint so the tension gauge securely pushes the distal part of the femoral guide against the femoral condyle.

Perform the distal cut through the distal femoral cut slot using a narrow oscillating saw (1.27mm thick, 12.5mm wide) (Fig. 12). Do not insert the saw blade more posteriorly than the pre-operatively planned saw blade excursion depth.

**Technique tip:** Ensure the saw blade is parallel with the cut slot to avoid moving the femoral guide.

**Technique tip:** Rotate the blade to cover the entire cut surface. If any remaining uncut bone remains, finish the resection by hand.

**Technique tip:** The PSI report will display the saw blade excursion depth and can be monitored if using an oscillating saw with depth markings.
Femoral Surgical Technique

Remove the fixation screws and the femoral cut guide.

Remove the distal bone resection.

Based on the pre-operatively planned femoral size, place the Femoral Finishing guide onto the distal femur cut.

Align the proximal hole on the Femoral Finishing guide over the pre-drilled distal hole location. Insert a pin through the proximal hole into the pre-drilled hole.

**Technique tip:** A 33mm headed screw can be used in place of a pin for additional fixation.

Adjust the femoral rotation by rotating the Femoral Finishing guide around the pin. The posterior surface of the femoral finishing guide should be parallel to the tibia cut. An under hang of 2-3mm is visible when the component is sized properly (Fig. 13).

**Technique tip:** If rotation is not satisfactory, remove the pin and follow standard placement of the Femoral Finishing guide.

Fixate the Femoral Finishing guide to the femur and finish the femur according to the ZUK Unicompartmental High Flex Knee Spacer Block surgical technique.
Check overall alignment using a spacer block with the desired poly thickness and a full leg drop down rod (if preferred) (Fig. 14).

Check Overall Alignment

![Image of Check Overall Alignment](image)

Fig. 14

Concave Tibial Spacer
00-5791-060-08_14

Alignment Rod
00-5785-079-00
Verify the pre-operatively planned tibia size with the corresponding Tibial Sizer (Fig. 15).

Finish the tibia according to the ZUK Unicompartmental High Flex Knee Spacer Block Surgical Technique.

Finish the knee according to the ZUK Unicompartmental High Flex Knee Spacer Block Surgical Technique.

**Technique tip:** It is recommended that a pulse lavage is used on the femur and tibia cut surfaces before cementing.
## SPEED PIN™ device and sawblades

<table>
<thead>
<tr>
<th>Type of Guide Cylinders</th>
<th>Compatible pins</th>
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<tbody>
<tr>
<td><strong>Femur</strong></td>
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<tr>
<td>Limitation Pin Cylinders</td>
<td>00-5983-040-48</td>
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<tr>
<td></td>
<td>7401-3471</td>
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<tr>
<td>Rotation Cylinder</td>
<td>00-5971-071-00</td>
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<tr>
<td>(no pinning needed)</td>
<td>7401-3401</td>
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<tr>
<td><strong>Tibia</strong></td>
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<tr>
<td>Limitation Pin Cylinder</td>
<td>00-5983-040-33</td>
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<tr>
<td>(if small size of tibia)</td>
<td>7401-3470</td>
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<tr>
<td>and/or</td>
<td>00-5983-040-48</td>
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<tr>
<td>Stop-Pin Cylinder</td>
<td>00-5901-020-00</td>
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<td>7401-3490</td>
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### Sawblades

<table>
<thead>
<tr>
<th><strong>Recommended Oscillating Sawblades</strong></th>
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<tbody>
<tr>
<td>7144-0389 Stryker 2000/Systems 4 &amp; 5 Straight Blade</td>
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<tr>
<td>7144-0367 Linvatec Hall PowerPro Straight Blade</td>
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<tr>
<td>7144-0381 3M MaxiDriver Straight Blade</td>
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<tr>
<td>7220-4188 Dyonics StableCut Straight Blade</td>
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<tr>
<td>7220-4152 Dyonics Diamond Ground Teeth Straight Blade</td>
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<tr>
<th><strong>Recommended Reciprocating Sawblades</strong></th>
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<tbody>
<tr>
<td>7144-1573 Stryker Single-sided</td>
</tr>
<tr>
<td>7144-1574 Hall Single-sided</td>
</tr>
<tr>
<td>7144-1575 Synthes Single-sided</td>
</tr>
<tr>
<td>7220-4149 Dyonics Single-sided</td>
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### SPEED PINs Sawblades

<table>
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<tr>
<th><strong>IM Femoral Resector</strong></th>
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<tbody>
<tr>
<td>7401-3471</td>
<td>7144-0389 Stryker 2000/Systems 4 &amp; 5 Straight Blade</td>
</tr>
<tr>
<td>00-5791-041-00 (Headed Screw, 48mm)</td>
<td>7220-4188 Dyonics StableCut Straight Blade</td>
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<thead>
<tr>
<th><strong>EM Femoral Resector</strong></th>
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<td>7401-3471</td>
<td>7144-0389 Stryker 2000/Systems 4 &amp; 5 Straight Blade</td>
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<tr>
<td>00-5791-041-00 (Headed Screw, 48mm)</td>
<td>7220-4188 Dyonics StableCut Straight Blade</td>
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<tr>
<th><strong>ZUK Additional Disposable Pin</strong></th>
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<tbody>
<tr>
<td>00-5791-054-00 (Collapsing Holding)</td>
<td>7101-3470 (30mm Rimmed)</td>
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<tr>
<th><strong>Driver</strong></th>
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<tbody>
<tr>
<td>7401-3489 (SPEED PIN Quick Connect)</td>
<td>7101-3470 (30mm Rimmed)</td>
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<td></td>
<td>7101-3471 (45mm Rimmed)</td>
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<tr>
<td></td>
<td>7101-3480 (65mm Non-Rimmed)</td>
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<td></td>
<td>7101-3470 (30mm Rimmed)</td>
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<tr>
<th><strong>ZUK Screw Inserter/Extractor</strong></th>
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<tbody>
<tr>
<td>00-5791-049-00 (Screw Inserter/Extractor)</td>
<td>00-5791-044-00 (Headed, 33mm – Gold)</td>
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<tr>
<td>00-5791-041-00 (Headed, 48mm)</td>
<td>00-5791-042-00 (Headless, 48mm)</td>
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<tr>
<td>00-5791-043-00 (Headed, 27mm)</td>
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*Or any 0.050” or 1.27mm thick saw blade*