Zimmer® Patient Specific Instruments (CT)
Surgical Techniques for NexGen® Complete Knee Solution
Introduction

General Considerations

- *Zimmer®* PSI is not designed for use with the *Zimmer MIS Quad-Sparing™* Total Knee Procedure.

- *Zimmer PSI* should be used in conjunction with a femur first technique.

- Verify stability and fixation of all pins. When securing the conventional tibia cutting guides, avoid the use of spring pins as these may cause stress / unwanted shift on the tibia cutting guide.
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**NexGen Conventional Instruments – Femoral Technique**

**Position Femoral Pin Guide**
- Do not remove osteophytes from the femur.
- Position the Pin Guide on the distal femur (Fig. 1).
- Pin Guide will be captured by the anterior and proximal ridge of the femur. The guide fits over the edge on the proximal bone to increase locking.
- The A/P axis reference line on the Pin Guide can be used to assess alignment. The most distal end of the guide is parallel to the epicondylar axis and can also be used as reference.
- Apply anterior proximal pressure to the Pin Guide and verify a secure fit. Applying posterior pressure may destabilize the Pin Guide.

**Drill and Pin the Anterior Pin Holes**
- Drill and pin the medial and lateral anterior pin holes of the Pin Guide using the Universal Disposable Drill (2001-00-000) (Fig. 2).

**Drill Distal Pin Holes**
- Drill the distal pin holes of the Pin Guide (do not place pins) (Fig. 3).

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**Instruments**

- PSI Femoral Pin Guide 00-5970-015/018-00
- Universal Pin and Drill Kit 2001-00-000
Place Distal Cut Guide and Cut Femur
- Remove the Pin Guide by sliding it off the pins, leaving the anterior pins in the bone.
- Secure the MIS Distal Cut Guide (00-5967-036-00).
- Verify the distal resection on the medial and lateral side with a resection guide (00-5977-084-00). Check alignment if desired, and make the cut (Fig. 4).

Remove Distal Cut Guide and Place Distal Pins
- Locate the drilled pin holes.
- Remove the anterior pins.
- Place the distal pins in drilled holes of the distal femur (Fig. 5).

In the event the drilled distal holes are covered up following the distal cut, clean the area. Alternatively, prior to removing the anterior pins, place the Pin Guide back over the anterior pins and locate the distal pins through the distal Pin Guide holes (Fig. 6).

Instruments
- MIS Distal Cut Guide 00-5967-036-00
- Resection Guide 00-5977-084-00
- PSI Femoral Pin Guide 00-5970-015/018-00

TECHNIQUE TIP 1A.A
When performing the cuts, excessive force (considering the pressure being applied to the guide) on the medial or lateral side of the cut guide could influence the amount of varus/valgus in the cut.

TECHNIQUE TIP 1A.B
In the event the drilled distal holes are covered up following the distal cut, clean the area. Alternatively, prior to removing the anterior pins, place the Pin Guide back over the anterior pins and locate the distal pins through the distal Pin Guide holes (Fig. 6).
Place Femoral Finishing Guide

- Place the *NexGen* 4-in-1 Femoral Finishing Guide (silver) or the Flex Femoral Finishing Guide (gold) over the distal pins.
- Adjust the M/L positioning for appropriate placement.
- Secure the Finishing Guide and remove the pins. Verify resections using a resection guide and make the cuts (Fig. 7).

Follow 4-in-1 Femoral Surgical Technique

- Following the 4-in-1 cuts, proceed with the surgery as suggested in the *Zimmer MIS Multi-Reference*® 4-in-1 Femoral Instrumentation Surgical Technique.
NexGen Conventional Instruments – Tibial Technique

Position Tibial Pin Guide
- Remove the meniscus.
- Do not remove osteophytes from the tibia. Clean the bone around the ACL and anterior tibia where the guide fits. Remove any soft tissues that may prevent proper placement of the Pin Guide.
- Position the Pin Guide on the tibia (Fig. 8).
- The rotation cylinders do not make contact with bone surface. Both cylinders will be above the tibia surface. All other contact with the Pin Guide should ensure a proper fit.
- The mechanical axis and proximal resection lines may be used to assess the alignment. Additionally, the alignment arch (00-5977-024-00) and rod (00-5785-080-00) may be used to verify alignment. Additionally, the alignment adapter (00-5970-024-00) and rod (00-5785-080-00) may be used to verify alignment.

Drill and Pin Anterior Pin Holes
- Drill and pin the medial and lateral anterior holes of the Pin Guide (Fig. 9).

Instruments
- PSI Tibia Pin Guide 00-5970-015/018-00
- Universal Pin and Drill Kit 2001-00-000
- Alignment Adapter 00-5970-024-00
- Alignment Rod 00-5785-080-00
Establish Tibia Rotation (Drill Proximal Holes)

- Tibia rotation may be established through the Pin Guide per surgeon discretion.
- Drill the proximal medial and lateral holes of the Pin Guide (do not place pins) (Fig. 11).

Remove Tibial Pin Guide

- Remove the Pin Guide by sliding anteriorly off the pins (Fig. 12). Do not pry the Pin Guide from the tibia as this could shift the pins.

TECHNIQUE TIP 1B.A

When drilling the proximal holes, excessive side loads through the proximal guide cylinders could alter the planned hole position.
Secure Cut Guide and Cut Tibia

- Secure the NexGen Tibial Cut Guide. Verify the proximal resection on the medial and lateral side with a resection guide.
- Make tibial cut (Fig. 14).
- Use the appropriate right or left tibia cut guide.

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<th>0° Left Cut Guide</th>
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<td>0° Right Cut Guide</td>
<td>00-5997-076-00</td>
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- Insert the Alignment Arch into the Tibial Cut Guide, insert the Alignment Rod and check alignment.

Note: Two options are available for visually verifying the tibia alignment.
- The first option uses the standard alignment arch (00-5977-024-00). The pin placement of the tibial Pin Guide is offset 20 degrees medially to avoid soft tissues. Noting this offset placement, ensure the alignment rod is parallel with respect to the tibial shaft (Fig. 15).
- The second option uses the alignment adapter which accounts for the medial offset and provides a more traditional observance (aligned to the tibia shaft) for the visual alignment check.

<table>
<thead>
<tr>
<th>Alignment Adapter</th>
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<td>Alignment Arch</td>
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TECHNIQUE TIP 1B.B

When fixing the Cut Guide, excessive force from screws can alter the planned location and could influence the amount of varus/valgus in the cut.

TECHNIQUE TIP 1B.C

When performing the cuts, excessive force (considering the pressure from leaning on the guide) on the medial or lateral side of the cut guide could influence the amount of varus/valgus in the cut.
Position Tibial Sizing Plate
- Position the tibial sizing plate to align with the drilled proximal holes (Fig. 16).

TECHNIQUE TIP 1B.D
In the event the drilled proximal holes are covered up following the proximal cut, clean the area. Alternatively, prior to removing the anterior pins, place the Pin Guide back over the anterior pins and locate the proximal holes through the Tibial Pin Guide.

Follow 4-in-1 Femoral Surgical Technique
- Following the positioning of the tibial plate, proceed with the surgery as suggested in the Zimmer MIS Multi-Reference 4-in-1 Femoral Instrumentation Surgical Technique.

Instruments
- NexGen Tibial Sizing Plate (see above)
- NexGen Locking Tibial Tray Provisional Handle
- NexGen PRI Offset Sizing Plate Handle
- Alignment Rod 00-5785-080-00
NexGen Posterior Referencing Instruments – Femoral Technique

Position Femoral Pin Guide
- Do not remove osteophytes from the femur.
- Position the Pin Guide on the distal femur (Fig. 17).
- Pin Guide will be captured by the anterior and proximal ridge of the femur. The guide fits over the edge on the proximal bone to increase locking.
- The A/P axis reference line on the Pin Guide can be used to assess alignment. The most distal end of the guide is parallel to the epicondylar axis and can also be used as reference.
- Apply anterior proximal pressure to the Pin Guide and verify a secure fit. Applying posterior pressure may destabilize the Pin Guide.

Drill and Pin the Anterior Pin Holes
- Drill and pin the medial and lateral pin holes of the Pin Guide using the Universal Disposable Drill (2001-00-00) (Fig. 18).

Drill Distal Pin Holes
- Drill the distal pin holes of the Pin Guide (do not place pins) (Fig. 19).

Instruments
PSI Femoral Pin Guide 00-5970-015/018-00
Universal Pin and Drill Kit 2001-00-000
Place Distal Cut Guide and Cut Femur

- Remove the Pin Guide by sliding it off the pins, leaving the anterior pins in the bone.
- Secure the NexGen Posterior Referencing Distal Femoral Resection Guide (00-5901-064-00)
- Verify the distal resection on the medial and lateral side with a resection guide (00-5977-084-00). Check alignment if desired, and make the cut (Fig. 20).

**TECHNIQUE TIP 2A.A**

When performing the cuts, excessive force (considering the pressure being applied to the guide) on the medial or lateral side of the cut guide could influence the amount of varus/valgus in the cut.

Remove Distal Cut Guide

- Locate the drilled pin holes.
- Remove the anterior pins (Fig. 21).

**TECHNIQUE TIP 2A.B**

In the event the drilled distal holes are covered up following the distal cut, clean the area. Alternatively, prior to removing the anterior pins, place the Pin Guide back over the anterior pins and locate the distal pins through the distal Pin Guide holes.

Place Posterior Referencing Femoral Cut Guide

- Secure the NexGen Posterior Referencing 4-in-1 Flex Femoral cut guide, verify resections with a resection guide and finish the femur following the instructions from the Zimmer NexGen CR-Flex and LPS-Flex Knees Surgical Technique with Posterior Referencing Instrumentation (Fig. 22).

**Instruments**

- NexGen Posterior Referencing Distal Femoral Resection Guide 00-5901-064-00
- Resection Guide 00-5977-084-00
- NexGen Posterior Referencing 4-in-1 Flex Femoral Cut Guide 00-5901-041/048-00
NexGen Posterior Referencing Instruments – Tibial Technique

Position Tibial Pin Guide

- Remove the meniscus.
- Do not remove osteophytes from the tibia. Clean the bone around the ACL and anterior tibia where the guide fits.
- Remove any soft tissues that may prevent proper placement of the Pin Guide.
- Position the Pin Guide on the tibia (Fig. 23).
- The rotation cylinders do not make contact with bone surface. Both cylinders will be above the tibia surface. All other contact with the Pin Guide should ensure a proper fit.
- The mechanical axis and proximal resection reference lines on the Pin Guide can be used to assess alignment.

Drill and Pin Anterior Pin Holes

- Drill and pin the medial and lateral anterior holes of the Pin Guide (Fig. 24).

Instruments

PSI Tibia Pin Guide
00-5970-015/018-00

Universal Pin and Drill Kit
2001-00-000
Establish Tibia Rotation (Drill Proximal Holes)

- Tibia rotation may be established through the Pin Guide per surgeon discretion.
- Drill the proximal medial and lateral holes of the Pin Guide (do not place pins) (Fig. 26).

Remove Tibial Pin Guide

- Remove the Pin Guide by sliding anteriorly off the pins (Fig. 27). Do not pry the Pin Guide from the tibia as this could shift the pins.

TECHNIQUE TIP 2B.A

When drilling the proximal holes, excessive side loads through the proximal guide cylinders could alter the planned hole position.
Secure Cut Guide and Cut Tibia
- Secure the NexGen Posterior Referencing Tibial Cut Guide. Verify the proximal resection on the medial and lateral side with a resection guide.
- Make tibial cut (Fig. 29).
- Use the appropriate right or left tibia cut guide.

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<tr>
<td>0° PRI Left Cut Guide</td>
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<tr>
<td>0° PRI Right Cut Guide</td>
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- Insert the Alignment Adapter into the Tibial Cut Guide, insert the Alignment Rod and check alignment.

Note: If you wish to check alignment, use of the Tibia Alignment Rod with the NexGen Posterior Referencing Tibia Cut Guides allows for a standard observance of the tibia alignment rod (Fig. 30).

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<tr>
<td>Alignment Rod</td>
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TECHNIQUE TIP 2B.B
When fixating the Cut Guide, excessive force from screws can alter the planned location and could influence the amount of varus/valgus in the cut.

TECHNIQUE TIP 2B.C
When performing the cuts, excessive force (considering the pressure from leaning on the guide) on the medial or lateral side of the cut guide could influence the amount of varus/valgus in the cut.

Instruments
- NexGen PRI Tibial Cut Guide
  - 00-5901-075/076-00
- PRI Alignment Adapter
  - 00-5901-086-00
- Alignment Rod
  - 00-5785-080-00
Position Tibial Sizing Plate

- Position the tibial sizing plate to align with the drilled proximal holes (Fig. 31).

**TECHNIQUE TIP 2B.0**

In the event the drilled proximal holes are covered up following the proximal cut, clean the area. Alternatively, prior to removing the anterior pins, place the Pin Guide back over the anterior pins and locate the proximal holes through the Tibial Pin Guide.

Follow NexGen Posterior Referencing Instrumentation Surgical Technique

- Following the positioning of the tibial component, proceed with the surgery as suggested in the Zimmer NexGen CR-Flex and LPS-Flex Knees Surgical Technique with Posterior Referencing Instrumentation.

**Instruments**

- NexGen® Posterior Referencing Instruments – Tibial Technique
  - OR-
  - NexGen® Tibial Sizing Plate (see above)
  - NexGen Locking Tibial Tray Provisional Handle 00-5977-096-00
  - NexGen® PRI Offset Sizing Plate Handle 00-5953-096-00
  - Alignment Rod 00-5785-080-00
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