Optimizing exposure and preserving soft tissue during MIS THA
The Minimally Invasive Hip Instruments are specifically designed to facilitate THA through a mini-incision using a posterior-lateral incision. The comprehensive set of instruments helps reduce the complexity of a minimally invasive THA by optimizing exposure and access to the hip while protecting the delicate soft tissue structures.

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“Performing a total hip replacement through a mini-incision can be a challenging task. Adequate training and special instruments are needed to make a minimally invasive hip surgery both predictable and reproducible.”

These minimally invasive instruments have been designed in collaboration with Dr. L. Dorr, Director of the Arthritis Institute at Centinela Hospital in Los Angeles. We would like to thank Drs. Dore, K. Gustke, A. Hofmann, K. Mathis, D. Mochel, and W. Overdyke for their clinical evaluation of these instruments.
Zimmer MIS
Mini-Incision THA
Posterolateral Approach
Retractor Placement Guide
Instruments and surgical technique
developed in conjunction with:

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**Table of Contents**

<table>
<thead>
<tr>
<th>Section</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Overview</td>
<td>3-4</td>
</tr>
<tr>
<td>Initial Exposure</td>
<td>5-6</td>
</tr>
<tr>
<td>Femoral Resection</td>
<td>7-8</td>
</tr>
<tr>
<td>Acetabular Exposure</td>
<td>9-10</td>
</tr>
<tr>
<td>Acetabular Preparation</td>
<td>11-12</td>
</tr>
<tr>
<td>Femoral Preparation</td>
<td>13-14</td>
</tr>
<tr>
<td>Optional Femoral Preparation for Heavy Patients</td>
<td>15-17</td>
</tr>
<tr>
<td>Supplemental Guide</td>
<td>17</td>
</tr>
<tr>
<td>Ordering Information</td>
<td>18</td>
</tr>
</tbody>
</table>
Angled Acetabular Reamer System
Instrument impingement with the rim of the mini-incision can make adequate and precise reaming of the acetabulum difficult or even impossible with a straight reamer. This unique Reamer Shaft is angled at 45 degrees to prevent soft tissue impingement that tends to push the reamer into a superior position. The angled handle allows for additional surgeon control during reaming.

Elevator
The non-intrusive femoral neck Elevator facilitates delivery of the femur through a small incision and simultaneously protects skin edges and soft tissue structures during femoral canal reaming and broaching. The streamlined design eliminates the usual bulk and weight of some current neck elevators.

Retractors
The comprehensive set of Retractors improves access and exposure to the hip. The ‘working ends’ of these Retractors are contoured specifically for use in small areas. The long handles help keep assistants’ hands out of the surgical field.

Box Chisels
Contoured Box Chisels provide better access for removal of the overhanging superior edge of the greater trochanter without interfering with the edges of a small and narrow incision.

Screwdriver
The extended tip of the U-joint Screwdriver is designed to be used in conjunction with the standard-line Converge® CSTi™ Porous Acetabular Cup System 4.5-mm Drill Guide. This combination allows driving a screw from an angle and facilitates screw and dome hole plug placement in smaller incisions.
Curved Shell Impactor with Screwdriver

In a posterior-lateral mini-incision, a straight shell impactor very often proves to be inadequate. Impingement of the straight rod with the edge of the small incision makes it difficult to implant the acetabular shell in a physiological position. The curvature of the Shell Impactor allows the instrument to circumvent the edge of the skin incision. This enables the surgeon to properly impact the shell in the intended position.

T-Handle Rulers

This ingenious device allows measurement of important bony landmarks in a deep and small incision without interfering with wound edges.

Universal Head Holder

Inserting femoral trial heads and the final femoral heads can become a cumbersome and time-consuming task in a small incision. The Universal Head Holder incorporates four functions in one instrument:

- Firmly holding the head (or head trial) in place during insertion
- Removing the trial head without dropping it in the wound
- Placement of the head prosthesis
- Impaction of the head prosthesis

It has been said that this one instrument can save 5 minutes of OR time by itself.

Metasul® Insert Impactor

Direct, straight-line access to the acetabulum can be difficult to achieve during some instances of MIS hip surgery. This special impactor has been designed to facilitate proper seating of a Metasul® insert into a shell even if straight-line access to the insert cannot be achieved.

1 Designed to be used with the Converge® CSTI™ Porous Acetabular Cup System.

2 This instrument is designed to be used with the standard-line Converge® CSTI™ Porous Acetabular Cup System Impactor, P/N 9340-00-000.
Initial Exposure

Order of retractor placement

Insert Retractor #1
Insert Retractor #2

TIPS

The incision is made at the posterior border of the greater trochanter from the tip of the greater trochanter distally toward the level of the vastus tubercle.

Retractor #1
Small Bent Hohmann Retractor
Place over the greater trochanter to anteriorly retract the gluteus maximus, fat and skin.

- Elevates superior portion of gluteus maximus.
- Allows for visualization of the external rotator muscles and tendon of the gluteus medius muscle once the fat overlying these structures is incised.

Retractor #2
Slim Tip Hohmann Retractor
Place over the piriformis tendon and under the gluteus medius tendon to anteriorly retract.

- Exposes gluteus minimus.
Femoral Resection

Order of retractor placement
Retractors remaining from previous step:
Retractors #1 and #2
Insert Retractor #3
Remove Retractor #3

TIPS
• After the femoral neck and head are exposed, the hip is dislocated. Neck length can be measured using T-handled rulers from the center of the femoral head or the superior edge of the lesser trochanter.
• The level of the neck cut should be confirmed because if it is left excessively long, it interferes with retraction of the femur anterior to the acetabulum.
• Anterior osteophytes on the femoral neck should be removed at this time.

Retractor #1
Small Bent Hohmann Retractor

Retractor #2
Slim Tip Hohmann Retractor

Retractor #3
Short Wide Tip Hohmann Retractor
Insert along the medial neck and retract posteriorly.
• Separates bony femoral neck from soft tissues, particularly sciatic nerve.
• Helps protect sciatic nerve during femoral head resection.
Acetabular Exposure
Acetabular Exposure

Order of retractor placement

Retractors remaining from previous step:
Retractors #1 and #2
Move Retractor #2 behind anterior-superior capsule
Insert Retractor #4
Insert Retractor #5
Remove Retractor #2
Remove Retractor #1
Insert Retractor #6
Remove Retractor #6

TIPS

• Retractor #6 is removed to help prevent possible impingement with the sciatic nerve during the positioning of the femur and leg. To proceed to acetabular preparation, the leg is flexed at 30 degrees at the hip and 45 degrees at the knee and laid on the table.

Retractor #4
Double Bend Narrow Hohmann Retractor
Mallet into the posterior-superior corner of the acetabulum between the labrum and the posterior capsule.
• Retracts the posterior capsule for exposure of the acetabulum.

Retractor #5
Universal Snake Acetabular Retractor
Aim toward the anterior superior spine of the pelvis and mallet into the anterior ilium, anterior to the anterior-superior rim of the acetabulum
• Hooks the greater trochanter and retracts antero-superiorly.
• Allows femur to be pulled further anteriorly.

Retractor #6
Long Narrow Tip Hohmann Retractor
Positioned between the posterior capsule and the external oblique muscle.
• Protects the medial circumflex artery and vein carried in the external oblique muscle during capsular incision.
Acetabular Preparation
Acetabular Preparation

Order of retractor placement
Retractor remaining from previous step:
Retractor #4 and Retractor #5
Insert Retractor #7
Remove Retractor # 4 and Retractor #7

TIPS
For acetabular preparation, leg should be in flexed position at 30 degrees at the hip and 45 degrees at the knee and laid on the table.

- The acetabulum is first reamed with a straight handled reamer that is two sizes smaller than the preoperatively selected acetabular component size. The reamer should be angled into slight anteversion to protect the anterior wall while reaming the ridge down to the level of the cortical bone of the cotyloid notch.

- The curved reamer handle is used after the initial straight handled reaming. First, place the curved reamer transversely into the acetabulum in the same direction as the straight reamer. Ream the anteroposterior walls to this size; when the reamer spins freely it can be moved to the final position. Rotate the reamer handle into the position of 20° anteversion and 40° inclination. The reamer will cut bone in this position until the hemisphere is created, then will spin signifying the end point of reaming.

Retractor #5
Universal Snake Acetabular Retractor

Retractor #4
Double Bend Narrow Hohmann Retractor

Retractor #7 Left or #7 Right Posterior Retractor
Insert tip at a right angle into the obturator fossa at the level of the transverse acetabular ligament and around the edge of the cotyloid cortical bone. Spin to bring posterior capsule around.

- Paddle of retractor is seated onto ischium anterior to sciatic nerve to help protect the sciatic nerve. Hold gently to decrease any possible pressure on the sciatic nerve.

- Exposes entire medial and posterior inferior acetabulum and helps protect the sciatic nerve.

TIPS continued
- Standard shell/insert trialing and component implantation techniques should be used. The curved shell impactor is exclusively compatible with the Converge® Acetabular System to facilitate shell placement.
Femoral Preparation*

* See pages 15-16 for optional technique for larger patients.
Femoral Preparation*

Retractor #8
Femoral Neck Elevator
Place under the resected femoral neck with curved teeth positioned around the medial calcar.

- Elevates femur for straight access to the femoral canal.
- Protects proximal skin edges during femoral preparation.

Retractor #2
Slim Tip Hohmann Retractor
Placed proximal to the tip of the greater trochanter in the fat just deep to the gluteus medius.

- Retracts gluteus medius anteriorly.
- Provides exposure of entire cut neck.

Order of retractor placement

Retractors remaining from previous step:
Retractor #5 is left in place until #8 is positioned

Insert Retractor #8
Remove Retractor #5
Insert Retractor #3
Insert Retractor #2

TIPS

- The leg position for femoral preparation is moved from laying extended on the table to a flexed and internally rotated position with the operated leg resting on the down leg.
- Standard surgical techniques should be used for femoral preparation and component implantation.
- During femoral component implantation, the operated leg should be flexed, internally rotated and resting over the side of the table. This allows for the stem to be inserted in the proper anteversion. Then the leg is moved back on top of the down leg.
- Once the implant has achieved enough stability inside the femur so that anteversion will not change, the leg is moved back onto the table to maintain the flexion and internal rotation but with the operated leg resting on top of the down leg. This move is necessary if the neck of the femoral implant is not clearing Retractor #8.

Retractor #3
Short Wide Tip Hohmann Retractor
Inserted along the medial neck around the lesser trochanter.

- Separates femoral neck from the soft tissues, including the sciatic nerve.
- Provides clear exposure of the lesser trochanter.

* See pages 14-15 for optional technique for larger patients.
Optional Femoral Preparation for Heavy Patients
**Optional Femoral Preparation for Heavy Patients**

**Order of retractor placement**

Retractors remaining from previous step:
Retractor #5 is left in place until #8 is positioned

Insert Retractor #8
Remove Retractor #5
Insert Retractor #3
Insert Retractor #10
Insert Retractor #9, connect with #10 using bridge plate.

---

**Retractor #8**
**Femoral Neck Elevator**
Place under the resected femoral neck with curved teeth positioned around the medial calcar.

- Elevates femur for straight access to the femoral canal.
- Protects proximal skin edges during femoral preparation.
- Move retractor as necessary to protect skin during reaming and broaching.

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**Retractor #3**
**Short Wide Tip Hohmann Retractor**
Inserted along the medial neck around the lesser trochanter.

- Separates femoral neck from the soft tissues, including the sciatic nerve.
- Provides clear exposure of the lesser trochanter.

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**Retractor #10**
**Slim Tip Hohmann Retractor**
Placed proximal to the tip of the greater trochanter in the fat just deep to the gluteus medius.

- Retracts gluteus medius anteriorly.
- Provides exposure of the entire cut neck.

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**Retractor #9**
**Short Slim Tip Hohmann Retractor**
Placed over the greater trochanter to retract skin and fat.

**Note:** Retractors #9 and #10 are mobile with this placement and should be actively angled around to protect soft tissues during broaching.
TIPS (Optional Femoral Prep for Heavy Patients)

- The leg position for femoral preparation is moved from laying extended on the table to a flexed and internally rotated position with the operated leg resting on the down leg.
- Standard surgical techniques should be used for femoral preparation and component implantation.
- During femoral component implantation, the operated leg should be flexed, internally rotated and resting over the side of the table. This allows for the stem to be inserted in the proper anteversion.
- Once the implant has achieved enough stability inside the femur so that anteversion will not change, the leg is moved back onto the table to maintain the flexion and internal rotation but with the operated leg resting on top of the down leg. This move is necessary if the neck of the femoral implant is not clearing Retractor #8.
- Surgeon can hold the long handle of Retractor #8 against his/her abdomen. If two assistants are available, assistant opposite surgeon can hold the leg and connected Retractors #9 and #10. Assistant beside surgeon can hold Retractors #3 and #10.

Supplemental Guide

Initial Incision

Acetabular Reaming Position

Head Trial Placement

Capsule Closure Sequence
# Ordering Information

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<tr>
<th>Catalog No.</th>
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</tr>
</thead>
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<tr>
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<td>9375-00-007</td>
<td>Hohmann Retractor, Slim Tip</td>
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<td>9375-00-003</td>
<td>Hohmann Retractor, Short Wide Tip</td>
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<td>9375-00-004</td>
<td>Hohmann Retractor, Double Bend Narrow</td>
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<td>Universal Snake Acetabular Retractor*</td>
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**Universal MIS Hip Instruments**

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</tr>
</thead>
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<td>Vault™ MIS THA Instrument Case</td>
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<td>9375-00-991</td>
<td>Instrument Tray MIS THA (2 required)</td>
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<tr>
<td>9375-00-021</td>
<td>Box Chisel, Medium</td>
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<td>9375-00-022</td>
<td>Box Chisel, Large</td>
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<td>9375-00-025</td>
<td>Screwdriver, Extended Tip U-Joint</td>
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<td>9366-00-051</td>
<td>4.5-mm Drill Guide*</td>
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<td>9375-00-041</td>
<td>T-Handle Ruler, 40 mm</td>
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<tr>
<td>9375-00-042</td>
<td>T-Handle Ruler, 70 mm</td>
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<td>Head Holder, 28 mm</td>
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<td>9340-00-000</td>
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**Angled Reamer System**

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<td>9275-00-150</td>
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<td>9376-00-000</td>
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<td>9376-00-001</td>
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<td>9275-00-042 through 071</td>
<td>Bridgeback Acetabular Graters</td>
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**Implant Specific MIS Hip Instruments**

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<td>9375-00-032</td>
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<td>9306-01-003</td>
<td>Alignment Rod (3/16&quot;)*</td>
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<td>9375-00-061</td>
<td>Spherical Impactor for 28-mm Metasul®</td>
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**Legend**

* necessary standard-line instruments
Please refer to package insert for complete product information, including contraindications, warnings, precautions, and adverse effects.

Contact your Zimmer representative or visit us at www.zimmer.com