As described by:

**Lawrence G. Lenke, MD**  
The Jerome J. Gilden Professor of Orthopaedic Surgery  
Pediatric and Adult Spinal, Scoliosis and Reconstructive Surgery  
Washington University Medical School  
Co-Chief, Spinal Service  
Shriners Hospital for Children  
St. Louis, Missouri

**Andrew G. King, MD**  
Professor, Orthopaedic Department, LSU Health Sciences Center  
Co-Director of Spinal Unit  
Children's Hospital  
New Orleans, Louisiana
The goals of iliac fixation include leveling pelvic obliquity, correcting coronal and sagittal imbalance, and providing rigid fixation to help prevent pseudoarthrosis, dislodgement of instrumentation, and recurrence of deformity. The implants and instruments featured in this guide are versatile and can be used according to surgeon preference. Following are two methods for performing iliac fixation.

**STEP 1**

*Exposure and Starting Point Selection*

**Option 1:** Lateral dissection is done underneath the spinal fascia to reach the medial aspect of the iliac wing at its very distal aspect. The posterior superior iliac spine (PSIS) is identified, with the starting point for screw placement located 1cm inferior to the PSIS, and 1cm proximal to the distal edge of the PSIS (Figure 1). If required, the lateral aspect of the iliac wing may be subperiosteally exposed to help with the trajectory of the pathway down the iliac bone.

**Option 2:** The spine is stripped and cleared of soft tissue down to the mid-sacrum. Separate fascial incisions are made over each iliac crest at the periosteum of the outer table of the ileum. A Taylor retractor is then inserted to allow visualization of the sciatic notch and the ridge of bone that runs just above it. The iliac apophysis is then pared down until it lies flush with the sacral surface. In paring down the iliac crest to be flush with the sacrum, the widest path of the medullary cavity becomes obvious, usually just proximal to its most posterior part. This is the ideal site for insertion of the iliac screw (Figure 2).

**STEP 2**

*Screw Site Preparation*

**Option 1:** A 4mm burr is utilized to create a medial cortical defect at the appropriate starting point. Then using the iliac probe, with the tip facing medial and the trajectory being 45° caudal and lateral, the probe is tunneled down an intraosseus pathway into the distal ilium (Figure 3). It is more likely to exit lateral than medial, thus the reason for the probe facing medial. The ideal placement of the screw is just cephalad to the superior gluteal notch, the thickest part of the ilium, which also allows for bone graft harvest proximal to the definitive screw placement. Once the trajectory is made with the probe, a fine-tipped sounding device is utilized to palpate the intraosseus borders of the ilium to confirm intraosseus screw placement. Tapping of the trajectory can be done, but is not required, due to the self-tapping design of the screws.

**Option 2:** A standard awl is used to start the hole in the iliac crest. The iliac probe is then used to tunnel down the pathway into the distal ilium using the same trajectory as Option 1 (Figure 3). Next, the hole is palpated with a blunt probe to make sure it runs inside bone throughout its entire length.
STEP 3

Screw Selection

Depending on the dorsal height difference between the ilium and sacrum, often a 10° or 20° angled LEGACY Iliac Screw head will allow easier placement of the connector rod to avoid impingement of the dorsal sacral cortex. A 0° non-angled screw may be beneficial with an iliac screw trajectory that is more vertical. The screw trials are utilized to determine what screw type is best suited to the patient’s anatomy. Next the appropriate screw size is selected. In general, this is the longest, widest bolt that will fit the anatomy.

STEP 4

Screw Placement

The screw is placed using the appropriate screwdriver. Each screw type, 0°, 10°, and 20°, has its own screwdriver. The screwdrivers are matched to the angle of the screw head to allow a dorsal rotation of the instrument for smooth insertion of the screw. Once the screw is placed snugly into the ilium, it is important that the top of the screw head rest below the top of the PSIS (Figure 4). This will ensure that the screw will not be prominent postoperatively.

STEP 5

Lateral Connector Positioning and Rod Placement

The screw head is positioned facing directly medial to allow the lateral connector to engage and thus keep the rod vertical in its orientation. The length of the lateral connector necessary is determined following placement and alignment of the more cephalad spinal instrumentation with the goal being verticality of the rod with only sagittal plane bending and not coronal plane bending required. Once the offset is determined, the lateral connector can be cut with a standard rod cutter to the appropriate length. Next, the lateral connector is inserted into the screw head and the iliac screw set screw is provisionally tightened. The rod is then inserted into the lateral connector and cantilevered down into the cephalad spinal instrumentation (Figure 5). The set screw for the lateral connector is then placed and provisionally tightened.
**STEP 6**

*Set Screw Break-Off*

When all implants are securely in place, final tightening and break-off of the set screw head is performed (Figures 6a and 6b).

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MEDTRONIC SOFAMOR DANEK USA, INC.
1800 Pyramid Place  Memphis, TN 38132
(901) 396-3133  (800) 876-3133
Customer Service: (800) 933-2635
www.sofamordanek.com

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