Axi+Line™ Proximal Bunion Correction System
Surgical Technique
• Corrects both IM angle and frontal plane deformity
  • 87.3% of patients with hallux valgus have abnormal frontal plane rotation (pronation) of the 1st metatarsal
  • Other proximal/midshaft osteotomies, such as the Scarf do not address the frontal plane deformity, which has been shown to result in a recurrence rate of 78 percent

• The long oblique Proximal Modified Mau osteotomy
  • Provides intrinsic stability that may allow (at surgeon’s discretion) for early weight bearing
  • Maximizes fusion surface area and provides the ability to correct moderate to large angular deformities
  • Avoids violating a healthy metatarsal-cuneiform joint compared to a Lapidus procedure
  • Minimizes the probability of shortening compared to performing sawcut Lapidus procedure without use of the interposition autograft

• Osteotomy guide
  • Provides a templated path for a precise osteotomy

• Instrumentation provides full control of all bone fragments during the procedure and allows for a seamless transition from templating to plating

• Four angles of correction built into the plate, providing a self-reducing, 5-hole construct with bicortical locking or non-locking screw options

• Sterile kit – provides added efficiency and convenience for surgical team

Bone-to-Bone Cross Sectional Area

The Proximal Modified Mau is a transverse plane osteotomy that extends plantar-proximal to dorsal-distal when viewed in the sagittal plane. The defining feature of this osteotomy is the creation of a dorsal shelf which helps resist weight bearing forces. The Proximal Modified Mau creates good bone apposition for fixation, resulting in the most intrinsic stability of all proximal osteotomies. As seen to the right, the Proximal Modified Mau has much more bone to bone surface area compared to the Opening Wedge osteotomy.
1. Templating

**Axi+Line** templates (part no. LIT-1524) may be used to evaluate preoperative images and determine desired degree of correction.

## Pronation Correction

IM angle and frontal plane rotation correction are built into the plate. The degree of first metatarsal pronation is linearly related to the amount medial deviation of the first metatarsal.\(^\text{13}\)

<table>
<thead>
<tr>
<th>Plate</th>
<th>Approximated Pronation Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>5°</td>
<td>5°</td>
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<tr>
<td>7.5°</td>
<td>7.5°</td>
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<tr>
<td>10°</td>
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<tr>
<td>12.5°</td>
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2. Osteotomy Guide

Standard medial incision should be made to visualize entire first metatarsal shaft. Prepare site using standard surgical techniques, such as resecting exostosis if present. Mark center line of metatarsal shaft (blue line) and place left/right side specific **Osteotomy Guide**. Avoid placing guide too proximal which may cause the osteotomy to violate base of metatarsal.

**NOTE:** Release adduction hallucis.

**NOTE:** Edge of guide should be approximately 1cm distal to the metatarsal-cuneiform joint line.

3. Pin Insertion

Place proximal **Threaded Pin**, then distal **Threaded Pin**, making sure to achieve bi-cortical purchase with both pins.
4. K-Wire Insertion

Drive K-wire through superior hole, ensuring wire crosses both cortices. Remove K-wire and repeat for the second and third diagonal holes.

Remove non-threaded K-wires from diagonal holes.

NOTE: Put marker on K-wires prior to drilling the three diagonal holes for better visualization when cutting osteotomy.

5. Bushing Removal

Leaving Threaded Pins in place, remove Bushing from distal hole using the Hex Shaft and Driver Handle.

6. Osteotomy Guide

Remove the Osteotomy Guide.
7. Cut
Keeping saw blade parallel to the proximal **Threaded Pin**, make a Proximal Modified Mau osteotomy by sawing along the line extending through the three holes created by the **K-wires**.

Verify distal fragment mobility.

NOTE: Longer blade/angle

8. Plate Placement
Based on desired degree of correction determined during templating, select appropriate left or right **Axi+Line Plate** (5, 7.5, 10 or 12.5 degrees of correction) and place plate over the **Threaded Pins** as shown.

9. Reduction
Place **Nuts** on each **Threaded Pin**. Manually reduce with fingers by pinching **Plate** to bone. Hold **Plate** to bone to assist reduction. Starting with the **Nut** centered in each hole, alternately advance **Nuts** in small increments, while gently moving the distal fragment, until osteotomy and the plate on the bone is fully reduced. **Nuts** should be finger tight, do not over tighten. Verify position of toe is as desired.

WARNING: DO NOT use Nuts only to reduce plate to bone. Manual manipulation is required, especially in less dense bone.
Axi+Line Proximal Bunion Correction System - Surgical Technique Overview

10. Drill Hole #1

Thread Drill Guide into proximal, superior hole. Using the provided AO Drill Bit, drill through both cortices and measure using either the Depth Gauge or using the Drill Bit’s laser scale as measured from the top of the Drill Guide. Remove Drill Guide. Verify plate is sitting flush to the proximal bone. If not, loosen both Nuts and retighten while gently moving distal fragment. Select appropriate length Non-Locking Screw and drive using the T10 Driver. NOTE: T10 Shaft may be connected to a power driver if desired. Alligator clamp can be used to hold and reduce osteotomy.

11. Drill Holes #2 & #3

Thread Drill Guide starting with the inferior, transverse hole (2) and and repeat step 10 using appropriate Non-Locking Screw. Repeat for second distal hole using Non-Locking Screw (3).

12. Drill Holes A & B

Remove proximal Nut and Threaded Pin from hole A. Place Drill Guide and drill hole. Place appropriate Non-Locking or Locking Screw. Remove distal Nut and Threaded Pin from hole B and repeat for distal hole B. Close in the usual manner.

Screw Placement

Screws 1, 2, and 3 are Non-Locking Screws (Locking Screws may also be used). Screws A and B can be either Locking or Non-Locking Screws based on the surgeon’s judgement of bone quality or surgical preference.

Depth Gauge: Demonstrates 24mm depth
Nextremity Solutions has a long history of developing disposable, sterile, single-use systems. The new i3 Delivery System allows us to provide our surgeons with instruments and implants in a more efficient method.

The i3 Delivery System utilizes a patented tube-style packaging system to organize the implants for quick identification and ease of presentation to the sterile field. All required instruments for the procedure are also included in a disposable instrument kit. All items are contained in our reusable i3 Delivery case for easy product transportation and organization.
ORDERING INFORMATION - INSTRUMENT KITS, PLATES & SCREWS

<table>
<thead>
<tr>
<th>Part No.</th>
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<tr>
<td>KITS</td>
<td>Include: Osteotomy Guide, 2.2mm Threaded Wire (2), Drill Bushing, 2.6mm Drill, T10 Driver, Hex Shaft, Driver Handle, 1.6mm K-wire (2), Nut (2), Depth Gauge</td>
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<td>AXL-00R</td>
<td>Axi+Line Instrument Kit (RIGHT)</td>
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<td>Axi+Line Fluoroscopic Template (LEFT &amp; RIGHT)</td>
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References: