Auxein

Metatarsal Shortening Implant

Surgical Technique

NEXT-LEVEL CARE

ABOUT US

Auxein Medical is an integrated, research based, orthopaedic implants & instruments manufacturing company, producing a wide range of quality, affordable generic implants, trusted by healthcare professionals and patients across geographies. It is the Company's constant endeavour to provide a wide basket of generic and our innovator products that exceed the highest expectations of customers in term of quality and safety. The company has world-class manufacturing unit established in India and serves customers in over 75 countries worldwide.

IMPACTING HEALTHCARE GLOBALLY

Our Reach & Influence

500+
Employees Worldwide

75+
Operations in Countries

150+
Distributors Worldwide

20M+
Patients Cured

200+
FDA Approved Products

250+
Machines Worldwide

3000+
Orthopedic Solutions

Auxein is dedicated to advancing medical technology through innovative orthopedic solutions, including **Trauma, Arthroscopy, and Reconstructive Procedures**, with a commitment to improving patient outcomes worldwide. Our approach integrates advanced research, precision engineering, and high-quality manufacturing to develop reliable implants and surgical instruments that address the evolving needs of modern orthopedic practice.

OUR ACHIEVEMENTS



OVER THE YEARS

Disclaimer: Not all products in this catalogue are covered by European CE, US FDA, or other certifications. Please contact our Sales Team for product-specific certification details.


HAAS
HAAS
POWER ON
POWER OFF
EMERGENCY STOP
HANDLE JOG
RESET
F1
F2
F3
F4
OVERRIDES
CYCLE START
STOP
REV
SPINDLE

At Auxein, it is our goal to provide the best in class quality and value to every individual. Consistency is a virtue we pursue with a passion. From the procurement of raw materials to the manufacturing of our range of 1200+ orthopaedic implant products, we employee world-class systems and technology at par with the highest standards of globally recognized evaluation systems. Metatarsal Shortening Implant is part of our advanced orthopedic portfolio designed to support versatile fixation techniques in trauma and reconstructive procedures. Developed with input from global experts, the system provides reliable solutions for fixation of fractures, helping achieve stable fixation and accurate anatomical alignment.

METATARSAL SHORTENING SYSTEM

Indications For Use

Metatarsal Shortening Implant is indicated for use in stabilization and fixation of the small bones of the feet and ankle for the treatment of fractures, osteotomies, arthrodesis, nonunions, pseudoarthroses and malunions caused by revision, joint fusion or reconstruction procedures.

Contraindications

- Active, suspected or latent infection in the affected area
- Patients who are physiologically or psychologically inadequate
- Patients previously sensitized to titanium
- Longitudinal splits or longitudinal fractures
- Insufficient quantity or quality of bone to permit stabilization, conditions that retard healing (not including pathological fractures)
 and conditions causing poor blood supply
- Open epiphyseal plates
- In patients where there is a possibility for conservative treatment
- Indications not included in the

Indications For Use

- Loosening, deformation or fracture of the implant
- Acute post-operative infections and late infections with possible sepsis
- Migration, subluxation of the implant with resulting reduction in range of movement
- Fractures resulting from unilateral joint loading
- Thrombosis and embolism
- Wound hematoma and delayed wound healing
- Temporary and protracted functional neurological perturbation
- Tissue reactions as a result of allergy or foreign body reaction to dislodged particles
- Corrosion with localized reaction and pain
- Pain, a feeling of malaise or abnormal sensations due to the implant used
- Bone loss due to stress shielding
- Re-operation to remove or replace implants may be required at any time due to medical reasons or device failure.
 If corrective action is not taken, complications may occur.
- Use of an undersized implant in areas of high functional stresses may lead to implant fracture and failure.
- Plates and screws, wires, or other appliances of dissimilar metals should not be used together in or near the implant site.
- The implants and guide wires are intended for single use only.
- Instruments and K-wires are to be treated as sharps.

Product Description

The Auxein Metatarsal Shortening System is designed to provide fixation for an in-line, parallel shortening osteotomy of the lesser metatarsals. The system is designed to help eliminate potential complications that may arise from alternative osteotomies, such as post-operative floating toe, malunion of the metatarsal head, an altered distal articular surface, opening of the joint capsule, and/or the effects of an open capsulotomy.The Auxein Metatarsal Shortening implant is designed to thread into the distal metatarsal head after performing the desired osteotomy.

The proximal end of the implant is then inserted into the exposed intramedullary canal and the osteotomy is compressed, completely enveloping the implant. Finally, a Ø2.0 mm crossing screw is driven bicortically through the bone and proximal slot of the implant head to secure the shortening fixation.The Auxein Metatarsal Shortening System was designed with instrumentation to facilitate the procedure from start to finish. Cut Guides are available to allow for measured, parallel cuts, in 1 mm increments that range from 3 mm – 8 mm. Bone canal measurement tools are provided to allow for selection of an appropriately sized implant diameter.

Drilling tools are provided to prepare both the distal and proximal aspects of the metatarsal osteotomy for implant placement. A Wire Guide is provided to help place the crossing screw proximally to secure the implant and impart additional stability



Incision/Exposure

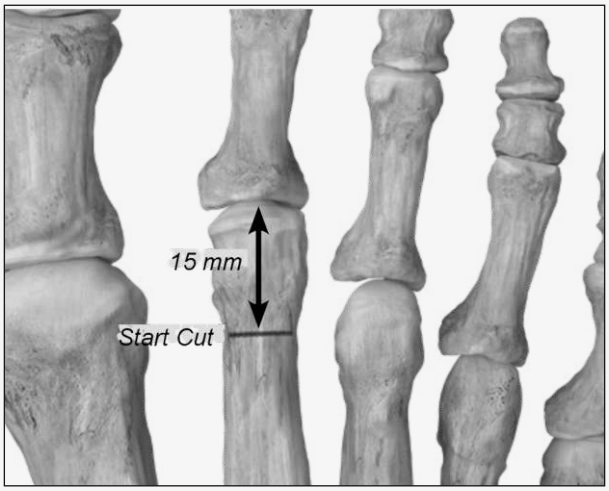
Make a longitudinal dorsal incision over the metatarsal that requires shortening. Use blunt soft tissue dissection to expose the dorsal metatarsal bone while taking care to avoid the extensor digitorum longus tendons. Loosen the soft tissue around the osteotomy site to improve access and maneuverability within the space. It is not required to make a capsular incision and expose the metatarsophalangeal (MTP) joint.

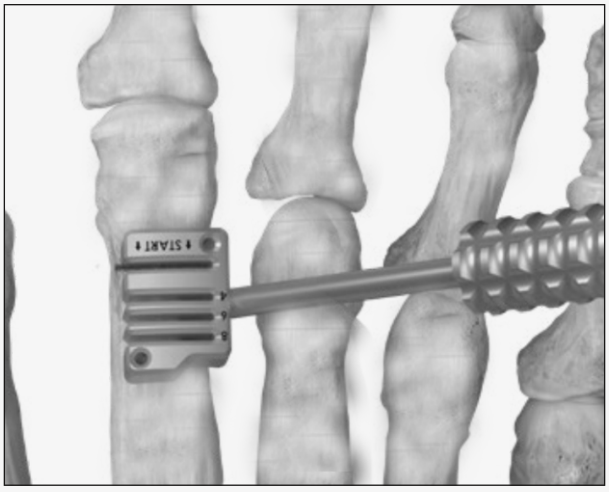
Establish the osteotomy location approximately 15mm proximal to the MTP joint at the metaphyseal-diaphyseal junction. This can be done by using a K-wire and fluoroscopy, as shown on the left. Mark the desired location dorsally with electrocautery (Start Cut)

Select the Cut Guide that allows for the desired cut distance. Align the distal (START) slot of the Cut Guide with the perpendicular electrocautery mark.

Item Code	Item Name
7-161-11	K-wire Ø1.30 mm x 80mm for Metatarsal Shortening System
7-161-12	K-wire Ø1.10 mm x 50mm for Metatarsal Shortening System





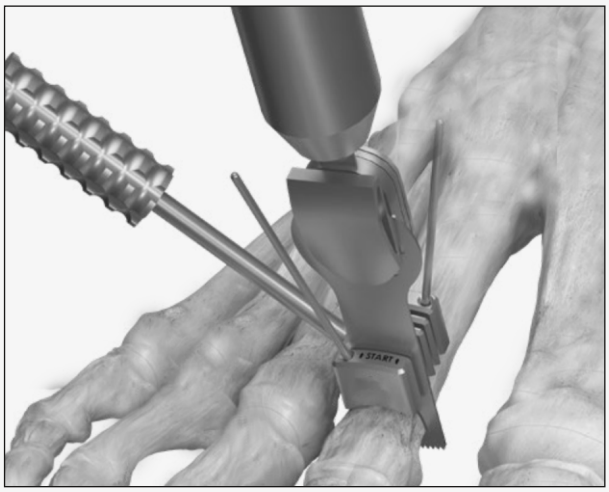


Insert Ø1.10 mm K-wires bicortically through both the distal and proximal oblique K-wire holes of the Cut Guide to secure the Cut Guide to the metatarsal. Before cutting, confirm the cut location using fluoroscopy and reposition if necessary.

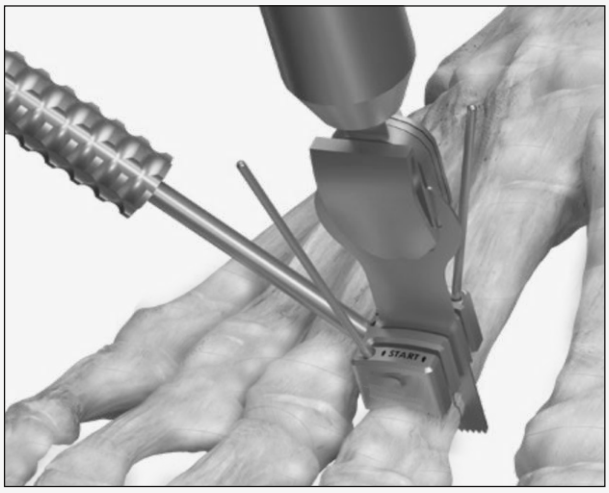


Osteotomy

While holding the Cut Guide against the metatarsal, use the provided sterile packed Saw Blade (5.5 mm or 10 mm, per surgeon preference) to create the first cut through the distal (START) slot. Complete this distal cut first to avoid prematurely loosening the metatarsal head.

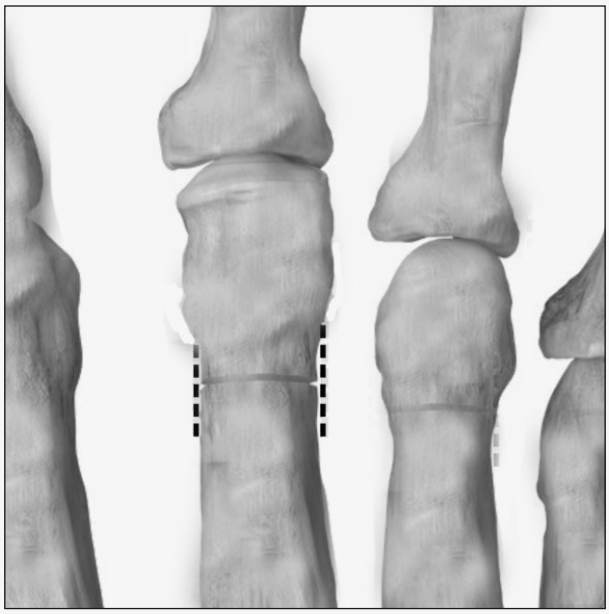


Using the same Saw Blade, make a second cut through the slot at the desired shortening distance (3 mm – 8 mm).



Item Code	Item Name
7-161-15	Cut Guide for 3 mm, 5 mm & 7 mm cuts
7-161-16	Cut Guide for 4 mm, 6 mm & 8 mm cuts

Remove the bone fragment and confirm that the cut surfaces are congruent when placed together under fluoroscopy. Remove any residual bone spurs or fragments if the cut surfaces are not congruent



IMPLANT SIZING

Starting with the smallest Implant Sizer and progressing up in size, expose the proximal intramedullary canal and insert the Implant Sizer to measure the inner diameter. The Implant Sizer should insert fully and fit snugly without the need to apply significant force. Confirm that the next largest size does not fit into the canal prior to the final size decision.

This measurement corresponds to the implant size to be used.



Item Code	Item Name
7-161-05	Implant Sizers Ø2.7 mm for Metatarsal Shortening System
7-161-06	Implant Sizers Ø3.5 mm for Metatarsal Shortening System
7-161-07	Implant Sizers Ø4.2 mm for Metatarsal Shortening System
7-161-08	Implant Sizers Ø5.0 mm for Metatarsal Shortening System



NOTE: In situations where the smallest sizer does not fit into the proximal canal, use the **7-161-21 Ø2.7 mm Reamer for Metatarsal Shortening System** attached to the provided Mini-AO Handle to ream the intramedullary canal to allow for the Ø2.7 mm implant to be inserted. The Reamer should be rotated clockwise until the Reamer bottoms out on the bone, as shown



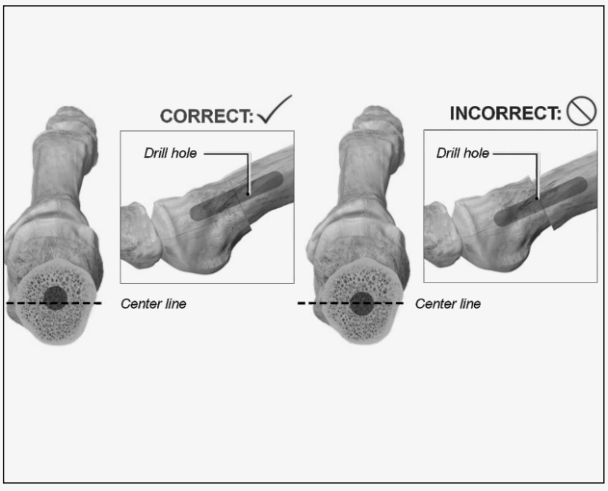
Reaming should be done by hand only, not under power.

Use the provided Shmogler Metatarsal Elevator (shown) or Mini Skin Hook to expose the cut surface of the distal metatarsal head. Obtain the appropriately-sized Pilot Hole Wire for the implant size to be used (see table above). Use the K-wire Ruler to confirm Pilot Hole Wire diameter before use.

Drill the distal pilot hole with the appropriate Pilot Hole Wire approximately 1 mm dorsal to center and at the same axial trajectory of the proximal metatarsal canal (see Note and images below



	Dia	Item Code	Item Code
	Ø2.7mm	12-019-2.7TI	12-019-2.7TI-S
	Ø3.5mm	12-019-3.5TI	12-019-3.5TI-S
	Ø4.2mm	12-019-4.2TI	12-019-4.2TI-S
	Ø5.0mm	12-019-5.0TI	12-019-5.0TI-S

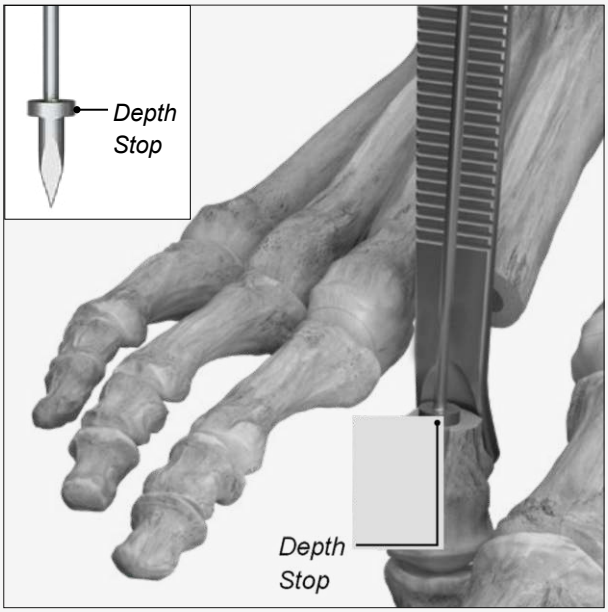


Insert the Pilot Hole Wire to the Depth Stop. Confirm the wire trajectory under fluoroscopy.

Select the Implant Inserter size corresponding to the implant size diameter. Attach the Inserter to the provided **7-161-26 Ratcheting Mini-AO Handle for Metatarsal Shortening System** and then insert the corresponding implant fully into the Inserter, ensuring that it is seated securely.

Thread the implant into the pilot hole in the distal metatarsal head by turning clockwise until the front edge of the Inserter is flush with the cut surface.Rotate the implant to ensure the slot in the Proximal Head of the implant is oriented dorsoplantar.

Item Code	Item Name
7-161-26	Ratcheting Mini-AO Handle for Metatarsal Shortening System







Hold the exposed (proximal) end of the implant with a straight Kelly clamp, or similar instrument. Simultaneously grab the proximal metatarsal shaft with the mini skin hook. Distract the distal metatarsal head and proximal metatarsal shaft to insert the exposed portion of the implant into the intramedullary canal.



Do not fully insert the implant into the proximal canal at this time to allow room for Wire Guide attachment in the next step.

Attach the Wire Guide to the Central Shaft of the implant, ensuring the Wire Guide is oriented dorsally to the metatarsal with the wire slot proximal. Compress the bone fragments together against the Wire Guide.

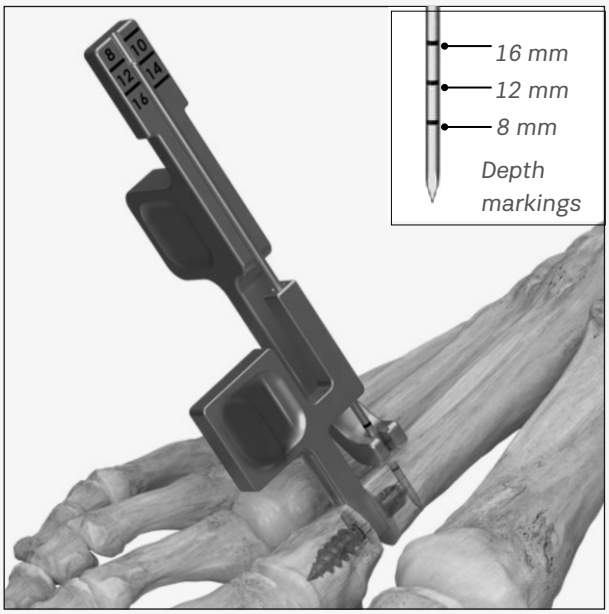


Drive a **7-161-11 K-wire Ø1.30 mm X 80mm for Metatarsal Shortening System** through the Wire Guide and both cortices of the metatarsal to create a pilot hole for the Ø2.0 mm Cortical Screw crossing screw. Before removing the K-Wire and Wire Guide, use fluoroscopy to ensure the tip of the K-wire is touching the plantar edge of the metatarsal. The K-wire will be proximal to the implant.



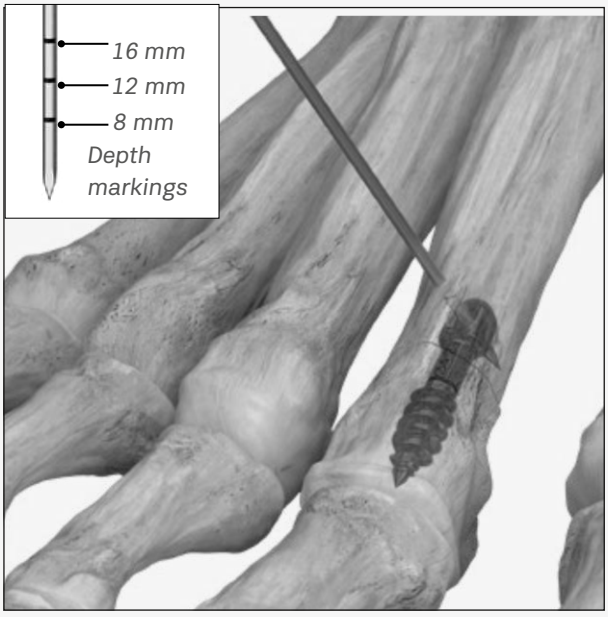
Item Code	Item Name
7-161-05	Implant Sizers Ø2.7 mm for Metatarsal Shortening System
7-161-06	Implant Sizers Ø3.5 mm for Metatarsal Shortening System
7-161-07	Implant Sizers Ø4.2 mm for Metatarsal Shortening System
7-161-08	Implant Sizers Ø5.0 mm for Metatarsal Shortening System

Attach the **7-161-14 Depth Gauge for Metatarsal Shortening System** to the K-wire by wrapping the distal portion around the wire and pushing it against the dorsal surface of the metatarsal. Measure the desired crossing screw length by reading the depth gauge proximally. The laser markings at 8 mm, 12 mm, and 16 mm on the provided Ø1.30 mm K-wire can also be used for depth measurement. If the appropriate crossing screw length is unclear because the wire depth falls between two potential screw lengths, round up to the larger length.



Remove the Depth Gauge, K-wire, and Wire Guide. Compress and hold the bone fragments together

Slide the Screw Holding Sleeve over the Hx7 Solid Driver and attach the Driver to the provided AO Handle. Select the appropriate Cortical Screw crossing screw based on the measured length. While compressing the bone fragments axially and avoiding dorsiflexion of the toe, insert the crossing screw through the drilled hole in the proximal metatarsal shaft by turning clockwise. Ensure the crossing screw is through the implant slot and has bicortical purchase
while confirming final implant position and length
using fluoroscopy.



Proceed to incision closure or concomitant procedures at this time.

Specialized Instrument Use

If it is difficult to get the exposed proximal portion of implant into the proximal canal (page 9), use the Implant Inserter to advance the threads distally. Be mindful that the implant threads do not advance through the MTP joint, and do not exceed one full (360°) turn of the Inserter.



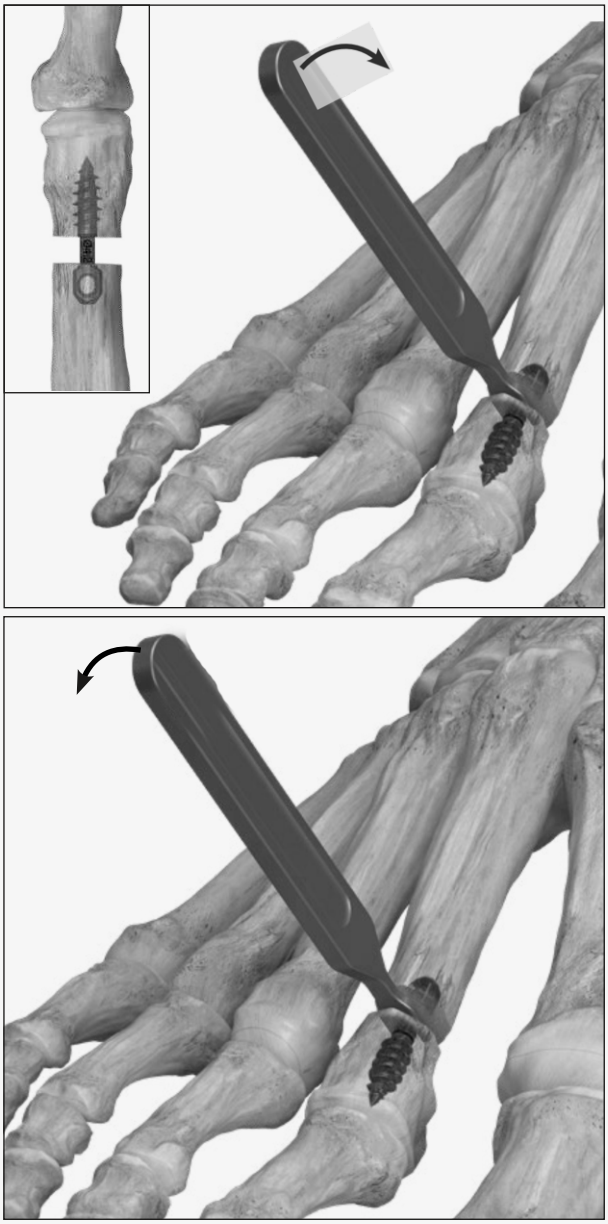




Once able to insert the proximal end of the implant, use the Slot Wrench to back out the implant by rotating clockwise from a distal perspective. Back out the implant the same rotational amount as further inserted previously, such that the distal edge of the implant's Central Shaft is flush with the distal cut surface, and the slot of the Proximal Head is oriented dorsoplantar.

If a gap remains between the two bone segments after crossing screw insertion, remove the screw and use the Slot Wrench to rotate the implant one half turn (180°) or one full turn (360°) counter-clockwise from a distal perspective, based on gap size. Ensure the implant is clocked properly to accept the crossing screw. Be mindful that the implant threads do not advance through the MTP joint.

Apply compression to oppose the bone fragments and re-insert the crossing screw into the screw hole to allow for improved bone apposition upon seating the screw

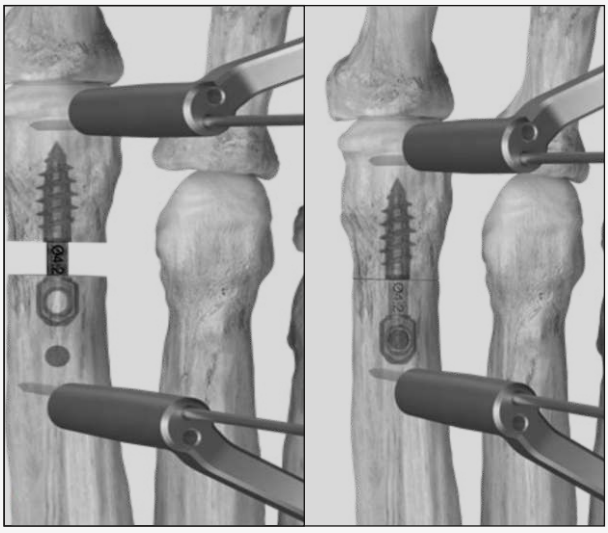


If assistance is needed when compressing the bone fragments together against the Wire Guide insert a Ø1.30 mm K-wire at an oblique angle into the distal metatarsal head, avoiding the joint, distal of the implant threads. Insert another Ø1.30 mm K-wire at the same oblique angle into the proximal metatarsal shaft, bicortical, proximal to the Wire Guide. Slide the Pin Compressor over the two Ø1.30 mm wires and compress the bone fragments together against the Wire Guide.

After making the pilot hole for the crossing screw and using the Depth Gauge to measure the desired screw length, continue to use the Pin Compressor to compress the bone surfaces and fully seat the proximal implant before placing the crossing screw.







Implant Removal

- If implant removal is required, attach the HX7 Solid Driver to the provided AO Handle. Identify the head of the screw at the dorsal-proximal end of the implant. Insert the Driver and rotate counterclockwise to remove the crossing screw. Pass the crossing screw from the operative site. Metatarsal Nail until two-finger tightness is achieved.

Distract the osteotomy site to expose the proximal end of the implant. If bone healing has occurred, create an osteotomy around the central aspect of the implant, then distract the osteotomy to expose the proximal end of the implant. The provided Pin Distractor can be used to assist in this step, if needed.

Assemble the provided AO Handle to the appropriate Implant Inserter based on implant size. Connect the exposed (proximal) end of the implant to the Implant Inserter and rotate counterclockwise until the implant is removed. Confirm complete implant removal under fluoroscopy.

Item Code	Item Name
1138-39	Star Screwdriver for 2.0mm Screws-Hand & Foot System





Metatarsal Shortening Implant



NON STERILE

Length	Code
Ø2.7mm	12-019-2.7TI
Ø3.5mm	12-019-3.5TI
Ø4.2mm	12-019-4.2TI
Ø5.0mm	12-019-5.0TI

STERILE

Length	Code
Ø2.7mm	12-019-2.7TI-S
Ø3.5mm	12-019-3.5TI-S
Ø4.2mm	12-019-4.2TI-S
Ø5.0mm	12-019-5.0TI-S

SCREWS

2.0mm Cortical Screw, Self-Tapping, (Star Head)

NON STERILE

Length	Titanium
6mm	TI-102.206
7mm	TI-102.207
8mm	TI-102.208
9mm	TI-102.209
10mm	TI-102.210
11mm	TI-102.211
12mm	TI-102.212
13mm	TI-102.213
14mm	TI-102.214
15mm	TI-102.215
16mm	TI-102.216
18mm	TI-102.218
20mm	TI-102.220
22mm	TI-102.222
24mm	TI-102.224
26mm	TI-102.226
28mm	TI-102.228
30mm	TI-102.230
32mm	TI-102.232
34mm	TI-102.234
36mm	TI-102.236
38mm	TI-102.238
40mm	TI-102.240

STERILE

Length	Titanium
6mm	TI-102.206-S
7mm	TI-102.207-S
8mm	TI-102.208-S
9mm	TI-102.209-S
10mm	TI-102.210-S
11mm	TI-102.211-S
12mm	TI-102.212-S
13mm	TI-102.213-S
14mm	TI-102.214-S
15mm	TI-102.215-S
16mm	TI-102.216-S
18mm	TI-102.218-S
20mm	TI-102.220-S
22mm	TI-102.222-S
24mm	TI-102.224-S
26mm	TI-102.226-S
28mm	TI-102.228-S
30mm	TI-102.230-S
32mm	TI-102.232-S
34mm	TI-102.234-S
36mm	TI-102.236-S
38mm	TI-102.238-S
40mm	TI-102.240-S



INSTRUMENTS

7-161-01 Implant Inserter Ø2.7mm for Metatarsal Shortening System



7-161-02 Implant Inserter Ø3.5mm for Metatarsal Shortening System



7-161-03 Implant Inserter Ø4.2mm for Metatarsal Shortening System



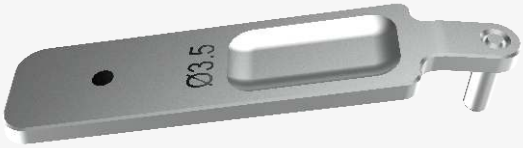
7-161-04 Implant Inserter Ø5.0mm for Metatarsal Shortening System



7-161-05 Implant Sizers Ø2.7mm for Metatarsal Shortening System



7-161-06 Implant Sizers Ø3.5mm for Metatarsal Shortening System



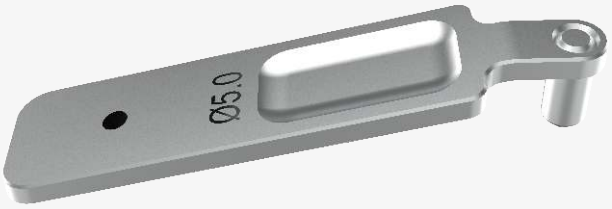
7-161-07

Implant Sizers Ø4.2mm for Metatarsal Shortening System



7-161-08

Implant Sizers Ø5.0mm for Metatarsal Shortening System



7-161-09

Pilot Hole Wire Ø2.25 mm for Metatarsal Shortening System



7-161-10

Pilot Hole Wire Ø2.75mm for Metatarsal Shortening System



7-161-11

K-wire Ø1.30mm x 80mm for Metatarsal Shortening System



7-161-12

K-wire Ø1.10mm x 50mm for Metatarsal Shortening System



7-161-13

Wire Guide for Metatarsal Shortening System



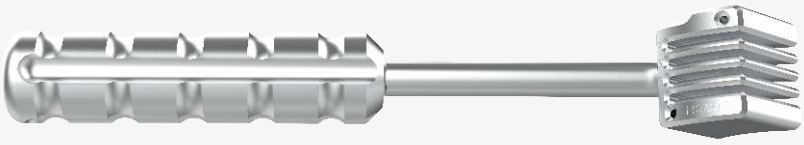
7-161-14

Depth Gauge for Metatarsal Shortening System



7-161-15

Cut Guide for 3mm, 5mm & 7mm cuts



7-161-16

Cut Guide for 4mm, 6mm & 8mm cuts



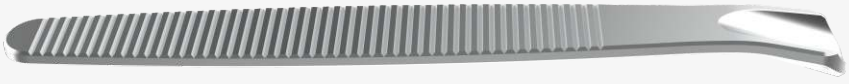
7-161-17

K-wire Ruler / Sizer for Metatarsal Shortening System



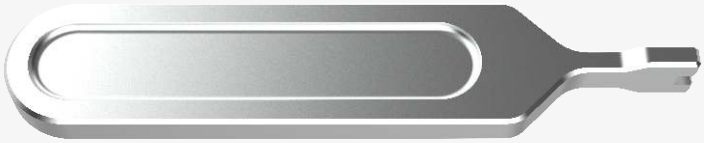
7-161-18

Shmogler Metatarsal Elevator for Metatarsal Shortening System



7-161-19

Slot Wrench for Metatarsal Shortening System



7-161-20

Mini Skin Hook for Metatarsal Shortening System



7-161-21

Ø2.7 mm Reamer for Metatarsal Shortening System



7-161-22

Screw Driver Shaft, T6 with AO Quick Coupling



7-161-23

Screw Holding Sleeve for 2.0mm Cortical Screw



7-161-24

Mini Pin Distractor for Metatarsal Shortening System



7-161-25

Mini Pin Compressor for Metatarsal Shortening System

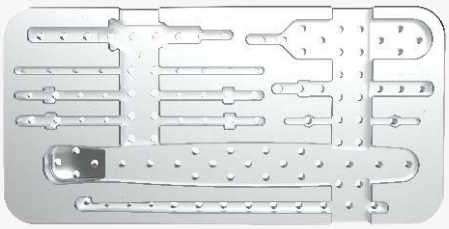
7-161-26

Ratcheting Mini-AO Handle for Metatarsal Shortening System



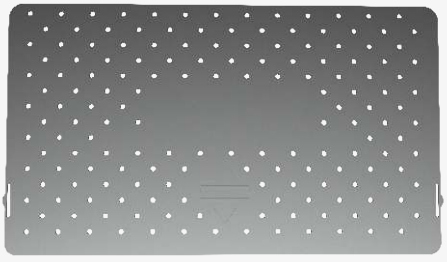
7-161-27

Implant Caddy for Shortening Instrument System



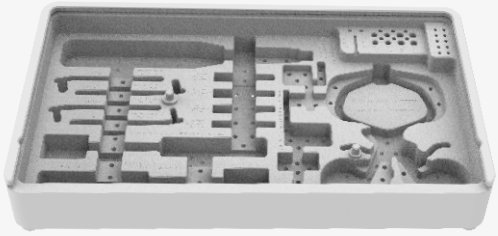
7-161-28

Lid for Metatarsal Shortening Instrument System



7-161-29

Container for Metatarsal Shortening Instrument System



OPTIONAL

1138-39	Star Screwdriver for 2.0mm Screws - Hand & Foot System



ORDER INFORMATION

7-164	Metatarsal Shortening System

Code	Set Consisting Of	Unit
7-161-01	Implant Inserter Ø2.7mm for Metatarsal Shortening System	1
7-161-02	Implant Inserter Ø3.5mm for Metatarsal Shortening System	1
7-161-03	Implant Inserter Ø4.2mm for Metatarsal Shortening System	1
7-161-04	Implant Inserter Ø5.0mm for Metatarsal Shortening System	1
7-161-05	Implant Sizers Ø2.7mm for Metatarsal Shortening System	1
7-161-06	Implant Sizers Ø3.5mm for Metatarsal Shortening System	1
7-161-07	Implant Sizers Ø4.2mm for Metatarsal Shortening System	1
7-161-08	Implant Sizers Ø5.0mm for Metatarsal Shortening System	1
7-161-09	Pilot Hole Wire Ø2.25mm for Metatarsal Shortening System	2
7-161-10	Pilot Hole Wire Ø2.75mm for Metatarsal Shortening System	2
7-161-11	K-wire Ø1.30mm x 80mm for Metatarsal Shortening System	4
7-161-12	K-wire Ø1.10mm x 50mm for Metatarsal Shortening System	4
7-161-13	Wire Guide for Metatarsal Shortening System	1
7-161-14	Depth Gauge for Metatarsal Shortening System	1
7-161-15	Cut Guide for 3mm, 5mm & 7mm cuts	1
7-161-16	Cut Guide for 4mm, 6mm & 8mm cuts	1
7-161-17	K-wire Ruler / Sizer for Metatarsal Shortening System	1
7-161-18	Shmogler Metatarsal Elevator for Metatarsal Shortening System	1
7-161-19	Slot Wrench for Metatarsal Shortening System	1
7-161-20	Mini Skin Hook for Metatarsal Shortening System	1
7-161-21	Ø2.7mm Reamer for Metatarsal Shortening System	1
7-161-22	Screw Driver Shaft, T6 with AO Quick Coupling	1
7-161-23	Screw Holding Sleeve for 2.0mm Cortical Screw	1
7-161-24	Mini Pin Distractor for Metatarsal Shortening System	1
7-161-25	Mini Pin Compressor for Metatarsal Shortening System	1
7-161-26	Ratcheting Mini-AO Handle for Metatarsal Shortening System	1
7-161-27	Implant Caddy for Shortening Instrument System	1
7-161-28	Lid for Metatarsal Shortening Instrument System	1
7-161-29	Container for Metatarsal Shortening Instrument System	1
1138-39	Star Screwdriver for 2.0mm Screws - Hand & Foot System	1



METATARSAL SHORTENING IMPLANT

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