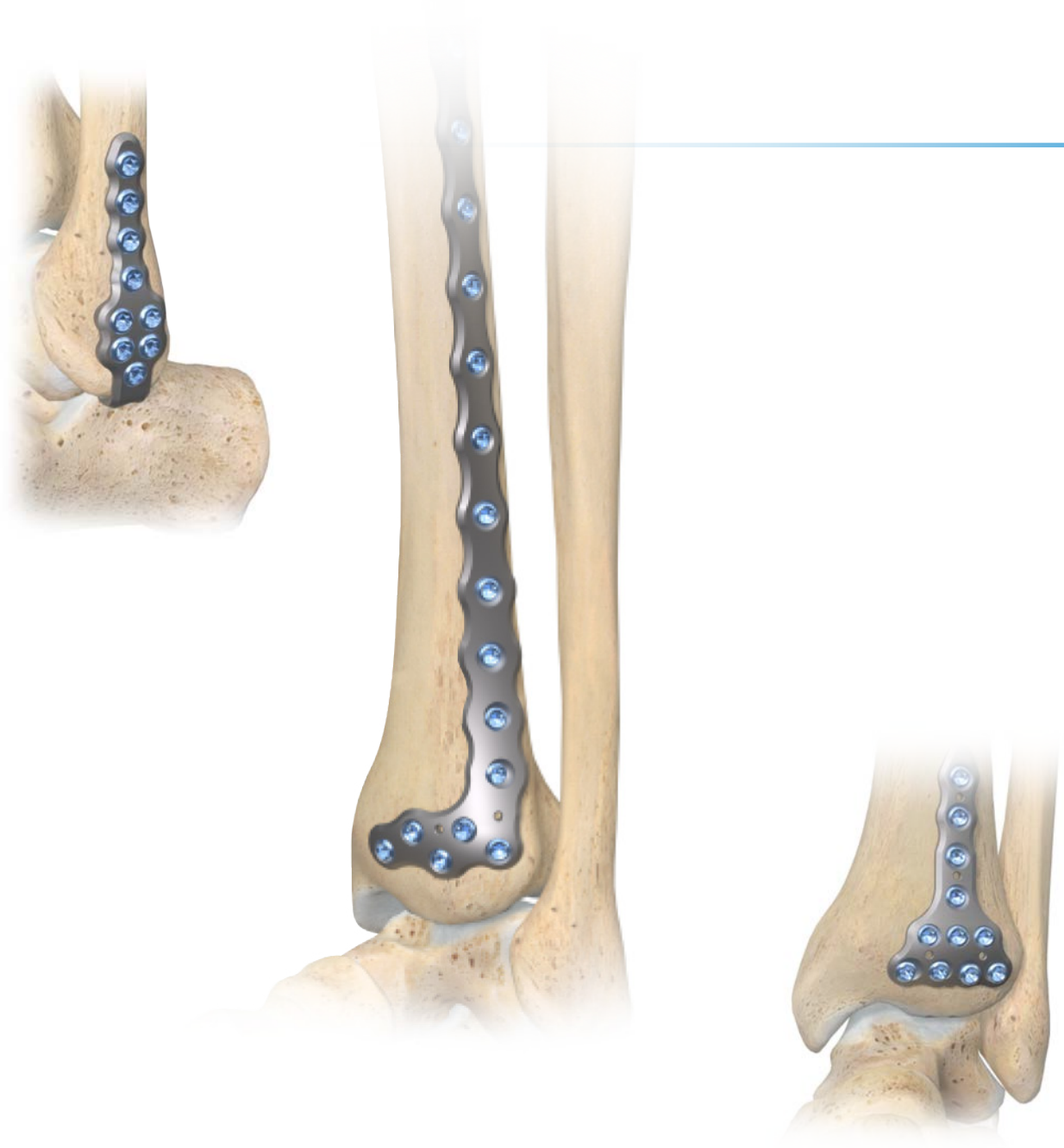
ZIMMER BIOMET
Moving You Forward.™

A.L.P.S.™ mvX Ankle Fracture System

Surgical Technique



A.L.P.S.™ mvX Ankle Fracture System

Surgical Technique

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Indications and Warnings

Indications

Zimmer Biomet Ankle Fracture System is indicated for Use in:

- Fixation of fractures of the distal tibia included, but not limited to, ankle fractures, periarticular fractures, corrective osteotomies, non-unions, intra- and extraarticular and distal tibia fractures with a shaft extension, and malleolar fractures.
- In intra- and extra articular fractures, osteotomies, medial malleolar fractures and nonunion of the metaphyseal and diaphyseal region of the distal fibula, and calcaneus.
- In distal tibia/fibula long bones which include the metaphyseal and diaphyseal regions of the tibia and fibula in the ankle.
- The Zimmer Biomet A.L.P.S. mvX Ankle Fracture System is not for Spinal Use.[1]

Contraindications

Contraindications include:

- Infection.
- Patient conditions including blood supply limitations, obesity and insufficient quantity or quality of bone.
- Patients with mental or neurologic conditions who are unwilling or incapable of following postoperative care instructions.
- Foreign body sensitivity. If material sensitivity is suspected, testing is required prior to implanting the device.

1. LBL-ZB202316 Rev. B-01

Comprehensive Ankle Fracture Care in One System

The A.L.P.S. mvX Ankle Fracture System is designed as the core system for the future of ankle fracture plating allowing for a single, cohesive platform across all ankle fracture applications.

Nine plating families provide sixty-nine plate options for accurate anatomic solutions for the full spectrum of ankle fractures and fusions, while a core instrument case creates a versatile solution for streamlined management and enhanced efficiency making the A.L.P.S. mvX Ankle Fracture System the ideal comprehensive ankle trauma solution.

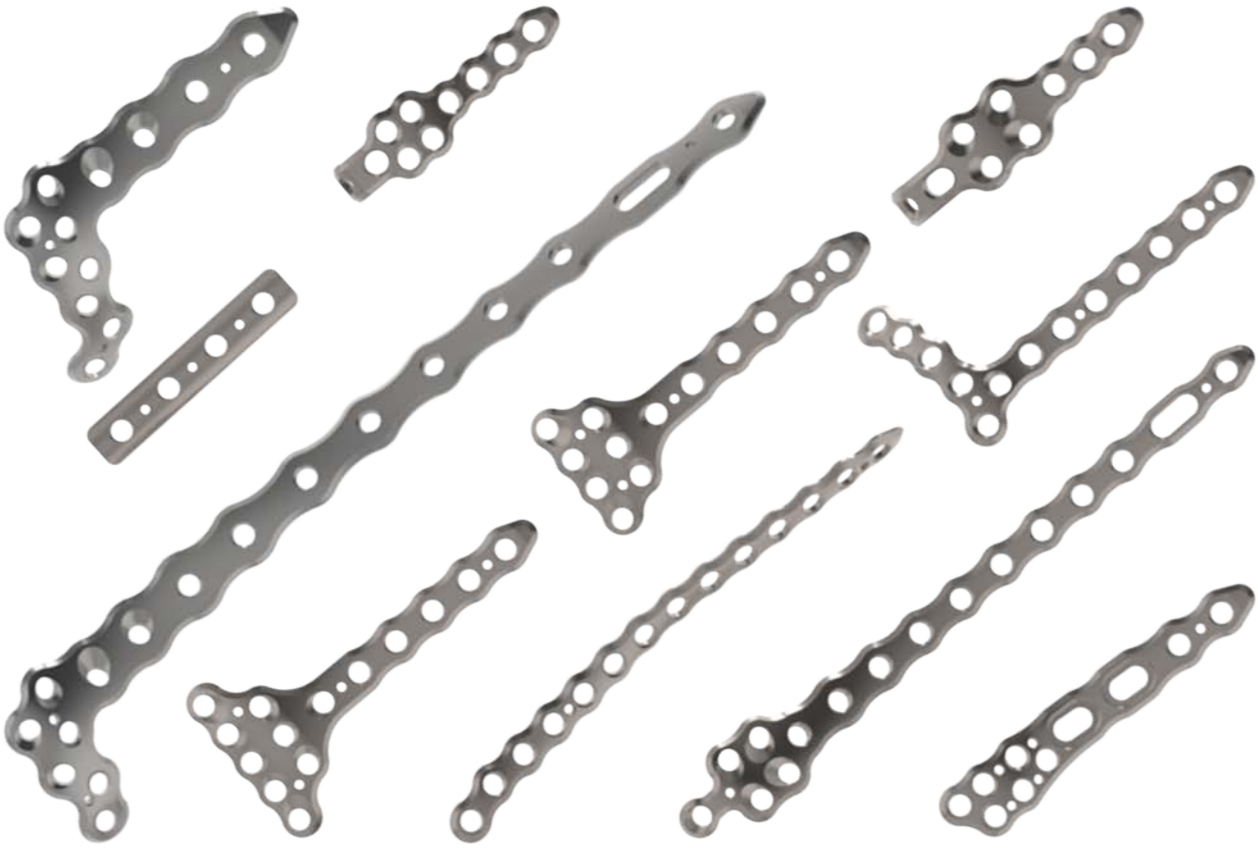
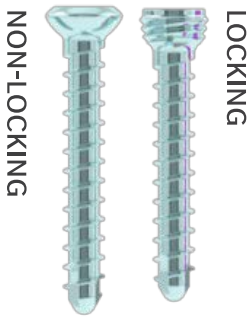
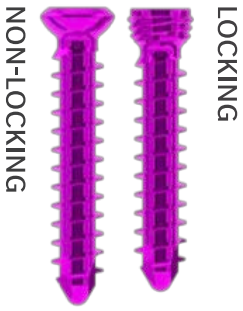


Plate Families

Plate Family Name	Offerings
 Anatomic Lateral Fibula	4-hole, 6-hole, 8-hole, 10-hole, and 12-hole plates Right and Left Options
 Posterior Fibula	8-hole, 10-hole, and 14-hole plates Right and Left Options
 ⅓ Tubular	2-hole, 4-hole, 6-hole, 8-hole, 10-hole,12-hole, and 15-hole plates
 Fibula Hook	4-hole and 6-hole plates
 Anterolateral Tibia	6-hole, 10-hole, 12-hole, and 16-hole plates Right and Left Options Wide and Narrow Options

Plate Family Name	Offerings
 Medial Tibia	6 hole, 10 hole, 12 hole, and 16 hole plates Right and Left Options
 Anterior Tibia	4-hole, 6-hole, and 8-hole plates Wide and Narrow Options
 Posterolateral Tibia	4-2 hole, 4-4 hole, 4-5 hole, 6-2 hole, 6-4 hole, 6-5 hole options Right and Left Options
 Medial Mallelous Hook	3 hole and 5 hole options

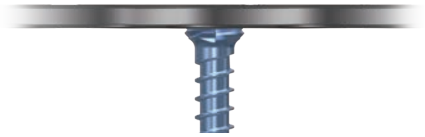
Screw Options

SCREW DIAMETER	2.7mm Screws	3.5mm Screws	4.0mm Screws
			
THREAD DIAMETER	2.7mm	3.5mm	4.0mm
DRILL	2.0mm	2.5mm	2.5mm
DRIVER	T15	T15	T15
SCREW LENGTH	10-50 (2mm increments) 55-100 (5mm increments)	10-50 (2mm increments) 55-100 (5mm increments)	10-50 (2mm increments) 55-100 (5mm increments)

Experience precision with variable angle locking screws that allow for up to 30 degrees off-axis insertions, ensuring optimal placement. Embrace versatility with an expansive suite of plate footprints. Envision efficiency with a system designed for a smooth surgical journey.

30°

Variable Angle Locking



Low Screw Head Prominence

Multiple Screw Insertions

Screw Options

SCREW DIAMETER	THREAD IN/FIXED ANGLE DRILL GUIDE	FIXED/VA DOUBLE DRILL GUIDE
Ø2.7mm	Thread In/Fixed 2.0mm Drill Guide	2.0mm Fixed Angle/VA Double Drill Guide
Ø3.5mm	Thread In/Fixed 2.5mm Drill Guide	2.5mm Fixed Angle/VA Double Drill Guide
Ø4.0mm	Thread In/Fixed 2.5mm Drill Guide	2.5mm Fixed Angle/VA Double Drill Guide

SCREW DIAMETER	DRILL	DEPTH GAUGE	COUNTERSINK	DRIVER
Ø2.7mm	2.0mm AO Drill, Short 2.0mm AO Drill, Long	2.7/3.5/4.0mm Depth Gauge	2.7mm Countersink	T15
Ø3.5mm	2.5mm AO Drill, Short 2.5mm AO Drill, Long	2.7/3.5/4.0mm Depth Gauge	3.5mm Countersink	T15
Ø4.0mm	2.5mm AO Drill, Short 2.5mm AO Drill, Long	2.7/3.5/4.0mm Depth Gauge	4.0mm Countersink	T15

Surgical Technique: Pre-Operative

Preoperative Planning

Preoperative planning is recommended before beginning the surgical procedure. Radiographic assessment of pilon fractures should include A/P, Lateral, Mortise and Oblique views of the distal tibia. A/P and Lateral x-rays of the contralateral uninjured ankle can also be taken preoperatively to provide insight into the characteristics of the pre-injured ankle.

For comminuted fractures, traction radiographs will allow for more precise identification of the fracture morphology and may facilitate preoperative planning. CT scans are very helpful in determining the precise amount of articular and rotary displacement and impaction of the fracture fragments. Preoperative planning should include patient positioning, placement of incision(s), careful soft tissue assessment, methods, and instruments required for fracture reduction, and the implants necessary for fixation. Instruments frequently required include: distractor, tension device, bone spreaders and reduction forceps or linear bone clamps.

Patient Positioning

The use of image intensification is required. The image intensifier should be sterile-draped and may be positioned from either the contralateral or ipsilateral side of the operating table. Position the patient based on fracture and surgeon preference on a radiolucent table, such that the injured ankle is near the end of the table. Elevate the leg on a padded bump with the knee slightly flexed to assist in a neutral positioning and placement.

Surgical Approaches

Approaches include an antero-medial incision, a standard anterior incision, or the lateral Böhler approach. When plating the fibula through a standard lateral approach, the surgeon should identify the tibial incision first to avoid narrow skin bridges between the two incisions. The fibular shaft and lateral malleolus should be reconstructed initially, depending on the tibial incision planned. If a midline or antero-medial incision is planned, a straight lateral or posterolateral incision can be used. Standard techniques of fibular plating are used. If an anterolateral approach to the tibia is employed, a postero-lateral incision can be used to fix the fibula. Alternately, both tibial and fibular fixation may be performed through the same anterolateral incision. Furthermore, if plain films and CT scan indicate that the posterior malleolus is "free floating", then this fragment must be fixed at the time of fibula fixation so that a stable fragment exists to reconstruct the articular surface. If this is not performed, the joint will be malreduced at the end of the surgery.

Antero-Medial Approach

Begin at the level of the distal shaft of the tibia, just lateral to the anterior crest, and continue distally as far as needed, staying medial to the anterior tibial tendon. Take the skin together with the subcutaneous tissue and the periosteum in a full thickness flap to prevent separation of the medial skin from its periosteal blood supply. Expose the joint through major tears in the soft tissue envelope. If needed, the joint capsule can be incised in line with the skin incision, to visualize the articular surface. This approach offers the surgeon an excellent view of the medial and anterior distal tibia, but visualization of the lateral tibial articular surface will be limited

Standard Anterior Approach

Make an 8 - 10 cm skin incision centered over the ankle, with most of the incision proximal to the joint. Distally, the incision stops at the level of the talo-navicular joint. Find and protect the superficial peroneal nerve, which crosses the wound from the lateral side. Incise the extensor retinaculum in line with the skin incision and expose the anterior tibial (AT) and extensor hallucis longus (EHL) tendons. Locate and protect the anterior tibial artery and deep peroneal nerve just medial to the EHL tendon at the level of the joint. Move the neurovascular bundle laterally along with the EHL; the AT should be moved medially. This exposes the ankle capsule. The exposure of the joint should be through the major tears in the soft tissue envelope. Excellent visualization of the medial, and anterior tibial plafond are possible with this approach, but visualization of the lateral tibial plafond again is somewhat limited.

Lateral Approach

Start 5 cm proximal to the ankle joint and slightly medial to Chaput's tubercle. Continue distally in a straight line toward the base of the third and fourth metatarsals. Identify and protect the superficial peroneal nerve and proceed through the subcutaneous tissue to expose the superior and inferior extensor retinaculum, and the tendons of the extensor digitorum longus, peroneus tertius, hallucis brevis, and the extensor hallucis longus. After dividing the extensor retinaculum, the tendons of the extensor digitorum longus and peroneus tertius, the deep peroneal nerve, and the dorsalis pedis artery are moved medially. In the distal aspect of the incision, the muscle belly of the extensor digitorum brevis can be seen, and, if greater distal exposure is needed, this can be mobilized. At completion, the exposure should allow visualization of the entire anterior face of the distal tibia, with excellent visualization of the lateral articular surface.

Surgical Technique - Anatomic Lateral Fibula Plate

1

Make a straight lateral or posterolateral surgical incision over the fibula. Continue along the incised area with soft tissue dissection to allow exposure of the fracture site.

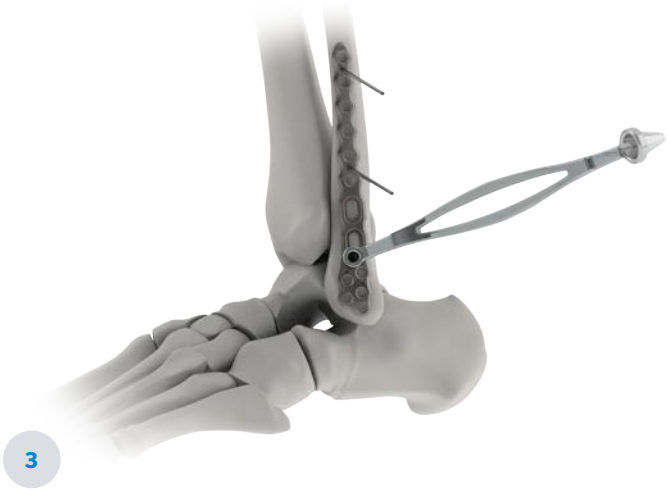
Expose and clean the fracture site and reduce the fracture. It is critical that fibular length, alignment, and rotation are accurately restored in the fracture reduction. Provisional reduction can be maintained with k-wires or reduction forceps, per surgeon preference.

Once adequate reduction has been maintained, select the appropriate anatomic lateral fibula plate for the fracture type and size (Figure 1).

2

The use of fluoroscopic imaging during plate placement in both the AP and lateral planes is recommended.

Plate tacks can be used to secure the plate to bone. Confirm plate placement using temporary fixation (Figure 2).



3

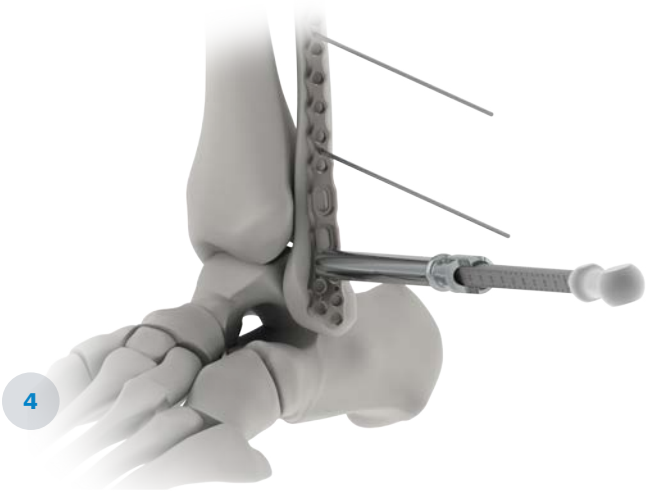
Based on the fracture site, select a locking hole to insert the first screw into and identify the proper screw for fixation.

All plate holes accept 2.7 mm, 3.5 mm (locking or non-locking) or 4.0 mm (non-locking) screws.

Select the appropriately sized drill guide (770004270 /770006270 / 770004350 / 770006350) based on screw diameter and place it in the chosen hole (Figure 3).

Optionally, users may use the corresponding Overdrill (770003270 / 770003350 / 770003400) or Countersink (770008270) if required for the desired indication

Surgical Technique - Anatomic Lateral Fibula Plate

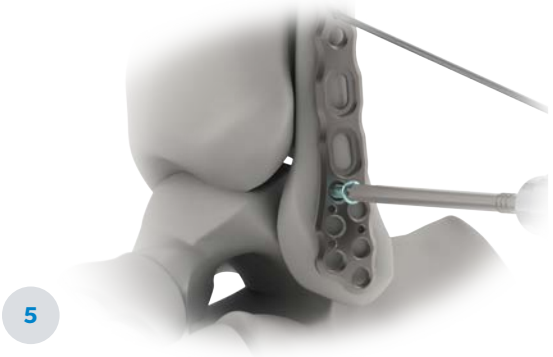


4

Drill to the desired depth using the appropriate drill for the desired screw diameter.

If using the ThreadIn/Fixed Drill Guide, screw length can be measured by either using the Depth Gauge (770009270) or by using the Thread In Drill Guide to read the measurement marks from the drill.

If using either side of the Double Drill Guide, screw length can only be measured using the Depth Gauge corresponding to desired screw diameter (Figure 4).



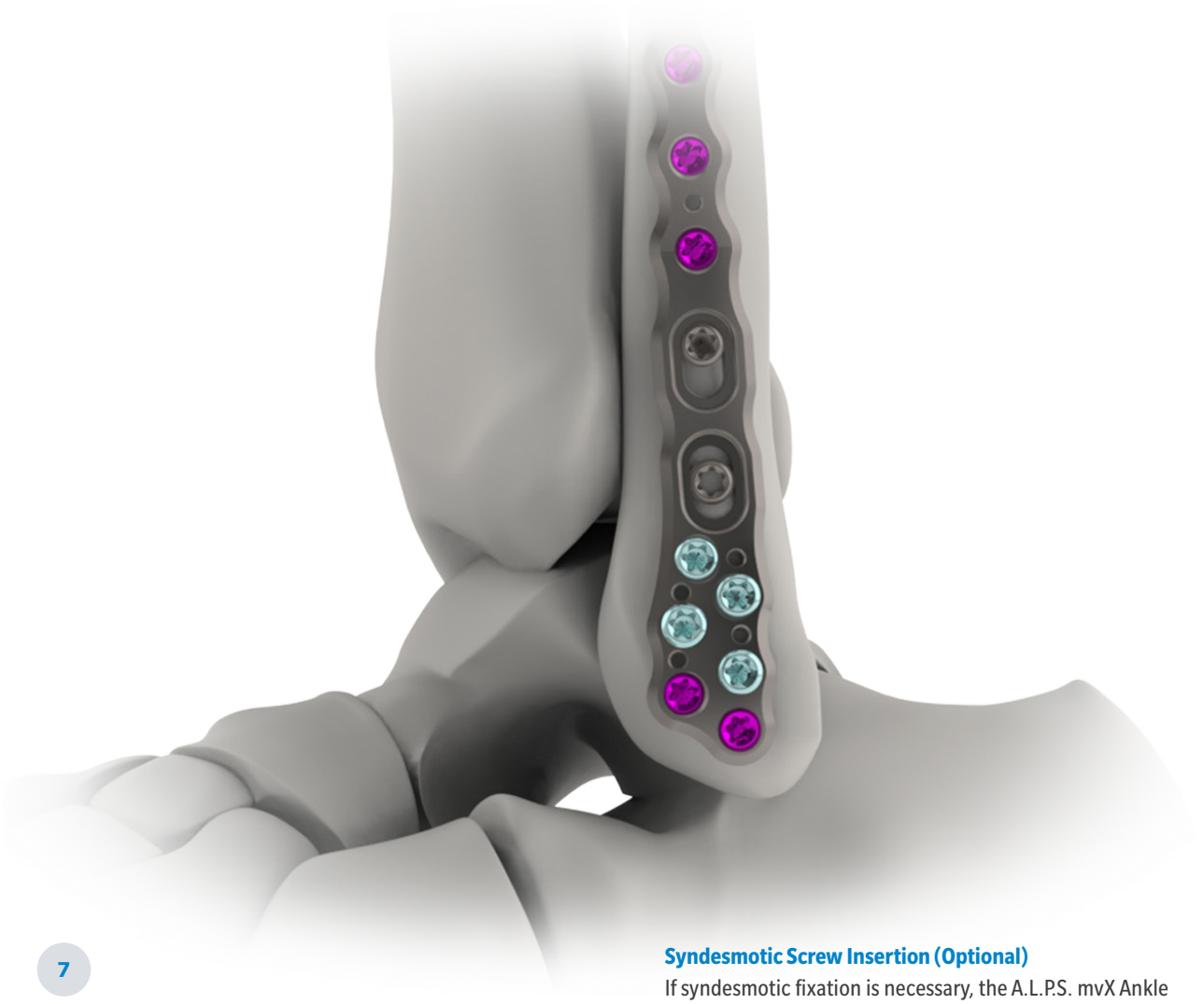
5

Connect the corresponding driver to the Ratcheting AO Handle (770017010) to advance and seat the screw (Figure 5).

6

Fill the desired remaining screw holes following the above technique, leaving the syndesmotic slots for optional fixation. (Figure 6)

Surgical Technique - Anatomic Lateral Fibula Plate

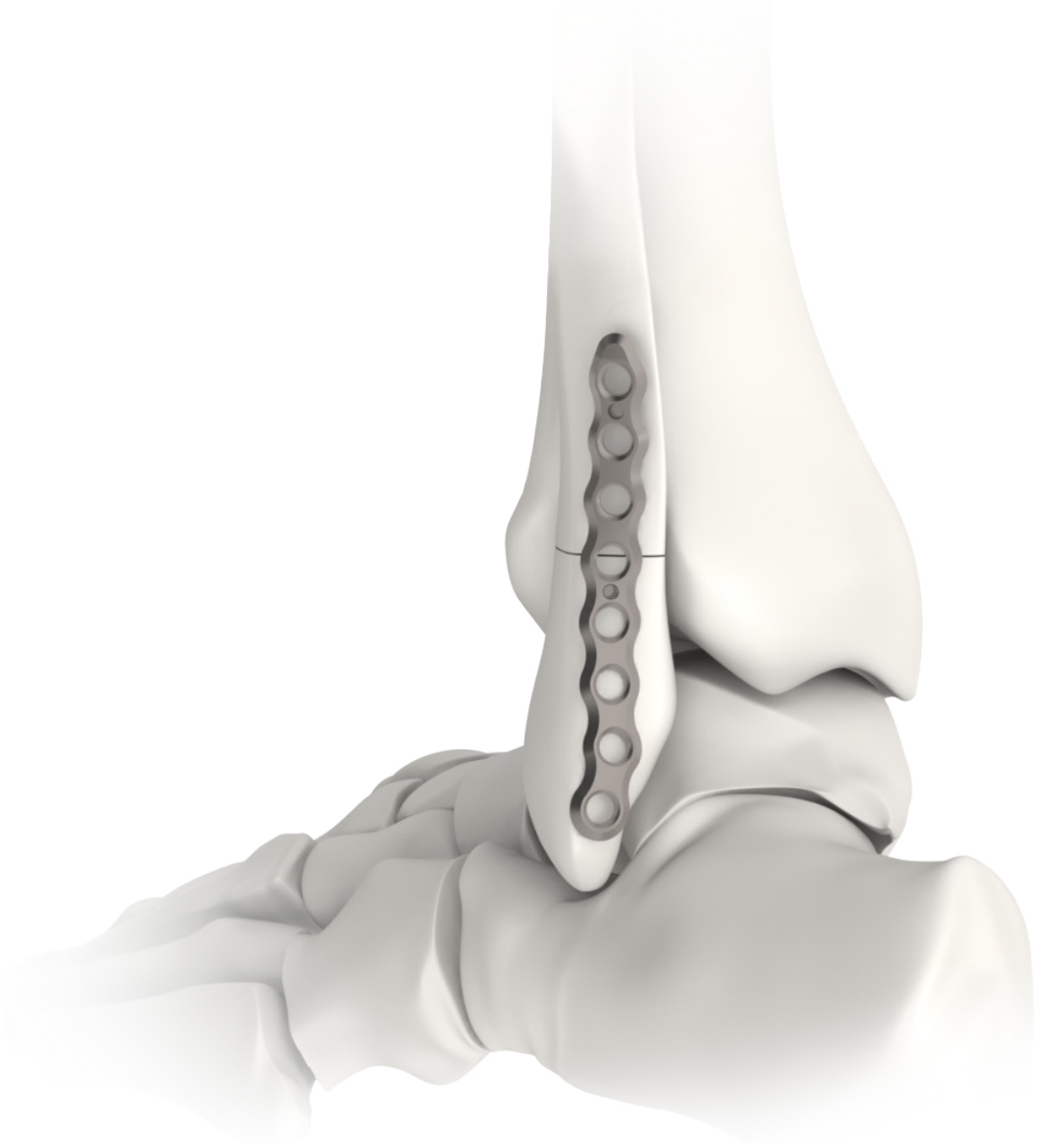


7

Syndesmotic Screw Insertion (Optional)
If syndesmotic fixation is necessary, the A.L.P.S. mvX Ankle Fracture System provides a 2.7 / 3.5 / 4.0 mm screw for the insertion of a syndesmosis screw. Using the above technique, it is recommended to drill 3-4 cortices for the desired screw size (Figure 7).

For syndesmotic button technique, refer to either the ZipTight[1] or Juggerloc[2] surgical techniques.

Surgical Technique - Posterior Fibula Plate



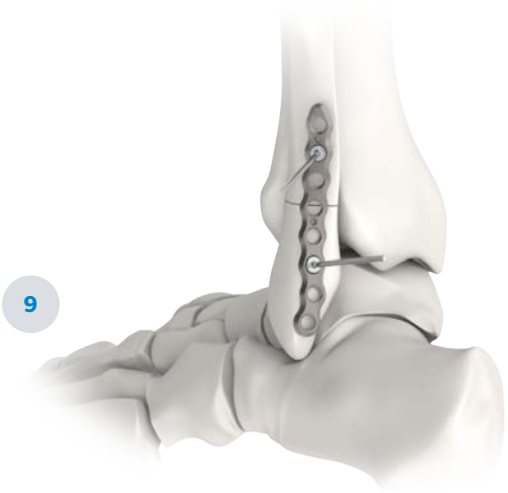
8

Make a lateral (supine or lateral decubitus position) or posterior (lateral decubitus) surgical incision over the fibula. Continue along the incised area with soft tissue dissection to allow exposure of the fracture site.

Expose and clean the fracture site and reduce the fracture. It is critical that fibular length, alignment, and rotation are accurately restored in the fracture reduction. Provisional reduction can be maintained with K-Wires or reduction forceps, per surgeon preference. Once adequate reduction has been maintained, select the appropriate posterior fibula plate for the fracture type and size **(Figure 8).**

Optionally, users may use the corresponding Overdrill (770003270 / 770003350 / 770003400) or Countersink (770008270) if required for the desired indication.

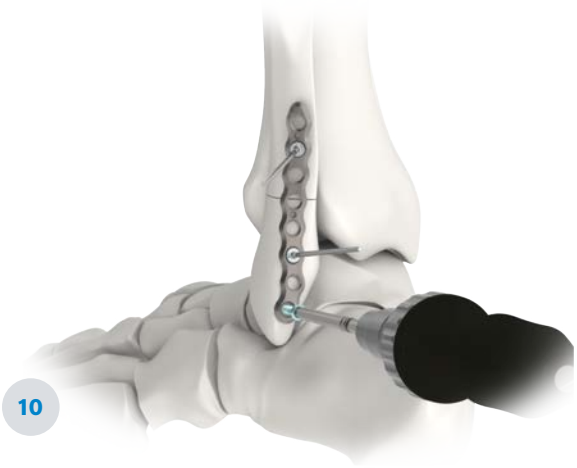
Surgical Technique - Posterior Fibula Plate



9

The use of fluoroscopic imaging during plate placement in both the AP and lateral planes is recommended.

K-Wires or plate tacks can be used to secure the plate to bone. Confirm plate placement using temporary fixation (Figure 9).



10

Based on the fracture site, select a locking hole to insert the first screw into and identify the proper screw for fixation.

All plate holes accept 2.7 mm, 3.5 mm (locking or non-locking) or 4.0 mm (opn) screws.

Select the appropriately sized drill guide (770004270 / 770006270 / 770004350 / 770006350) based on screw diameter and place it in the chosen hole.

Drill to the desired depth using the appropriate drill for the desired screw diameter.

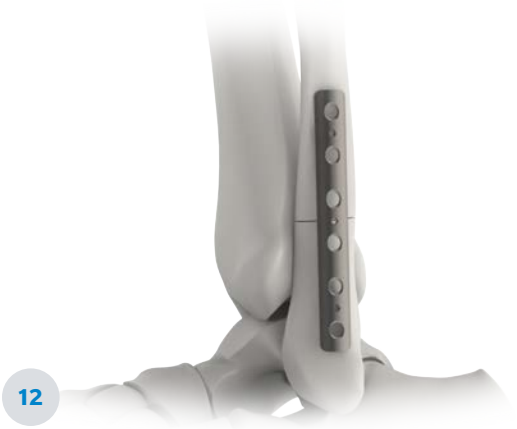
If using the ThreadIn/Fixed Drill Guide, screw length can be measured by either using the Depth Gauge (770009270) or by using the Thread In Drill Guide to read the measurement marks from the drill.

If using either side of the Double Drill Guide, screw length can only be measured using the Depth Gauge corresponding to desired screw diameter.
Connect the corresponding driver to the Ratcheting AO Handle (770017010) to advance and seat the screw (Figure 10).

11

Fill the desired remaining screw holes following the above technique (Figure 11).

Surgical Technique - 1/3 Tubular Plate

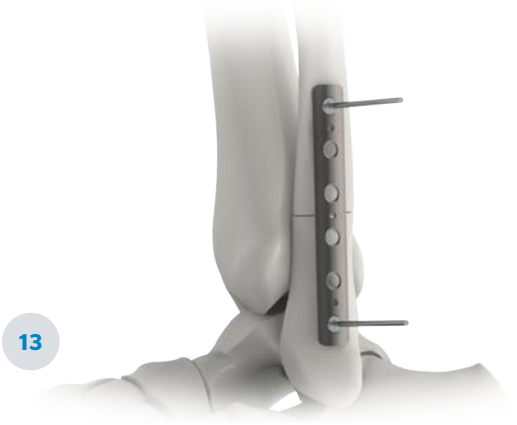


12

Make a straight lateral or posterolateral surgical incision over the fibula. Continue along the incised area with soft tissue dissection to allow exposure of the fracture site.

Expose and clean the fracture site and reduce the fracture. It is critical that fibular length, alignment, and rotation are accurately restored in the fracture reduction. Provisional reduction can be maintained with k-wires or reduction forceps, per surgeon preference.

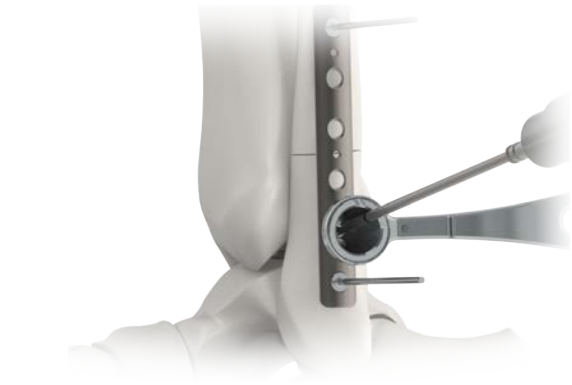
Once adequate reduction has been maintained, select the appropriate one third tubular plate for the fracture type and size (Figure 12).



13

The use of fluoroscopic imaging during plate placement in both the AP and lateral planes is recommended.

Plate tacks can be used to secure the plate to bone. Confirm plate placement using temporary fixation (Figure 13).



14

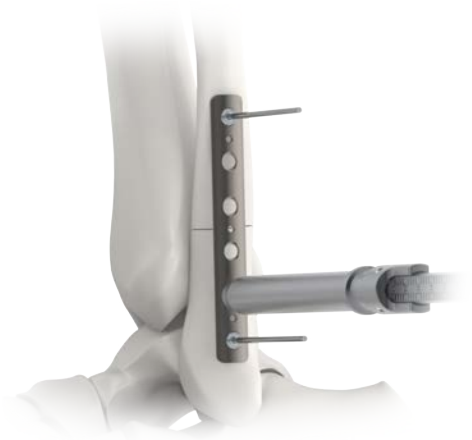
Based on the fracture site, select a locking hole to insert the first screw into and identify the proper screw for fixation.

All plate holes accept 2.7 mm, 3.5 mm (locking or non-locking) or 4.0 mm (non-locking) screws.

Select the appropriately sized drill guide (770004270 /770006270 / 770004350 / 770006350) based on screw diameter and place it in the chosen hole 14).

Optionally, users may use the corresponding Overdrill (770003270 / 770003350 / 770003400) or Countersink (770008270) if required for the desired indication.

Surgical Technique - 1/3 Tubular Plate

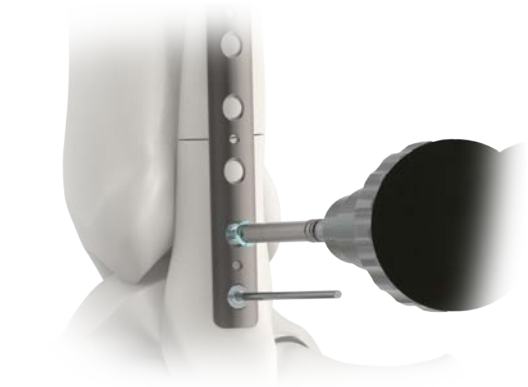


15

Drill to the desired depth using the appropriate drill for the desired screw diameter.

If using the ThreadIn/Fixed Drill Guide, screw length can be measured by either using the Depth Gauge (770009270) or by using the Thread In Drill Guide to read the measurement marks from the drill.

If using either side of the Double Drill Guide, screw length can only be measured using the Depth Gauge corresponding to desired screw diameter.(Figure 15).



16

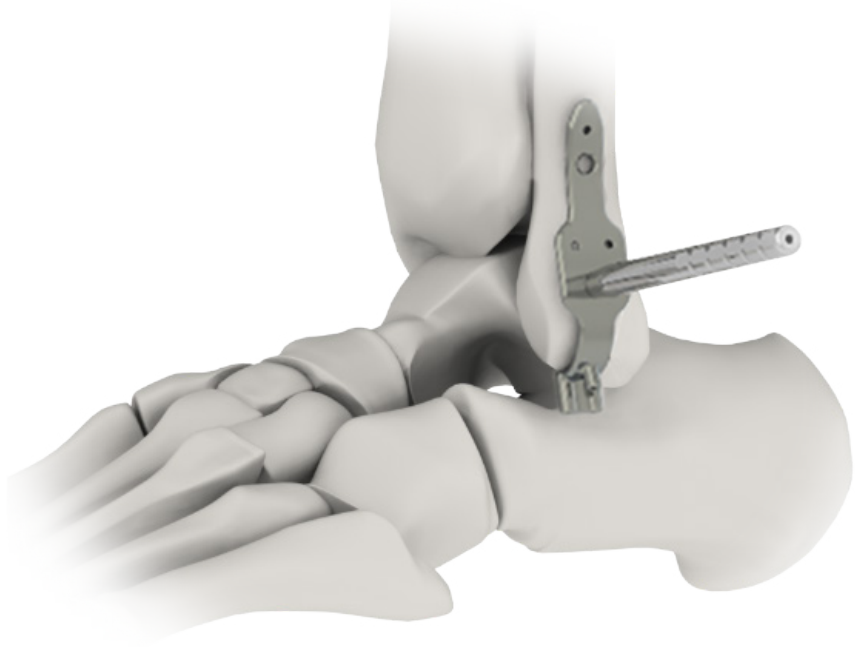
Connect the corresponding driver to the Ratcheting AO Handle (770017010) to advance and seat the screw (Figure 16).

17

18

Fill the desired remaining screw holes following the above technique (Figure 17 & 18).

Surgical Technique - Fibular Hook Plate



19

Make a straight lateral or posterolateral surgical incision over the fibula. Continue along the incised area with soft tissue dissection to allow exposure of the fracture site.

Expose and clean the fracture site and reduce the fracture. It is critical that fibular length, alignment, and rotation are accurately restored in the fracture reduction. Provisional reduction can be maintained with k-wires or reduction forceps, per surgeon preference.

Once adequate reduction has been maintained, select the appropriate medial malleolus hook plate for the fracture type and size. The drill guide is used as a template to determine implant positioning. A bending pin can be used as a handle for easier placement.

Once the desired placement is achieved, the guide must be secured in two locations using K-Wires or plate tacks. A K-Wire through the hole adjacent to the drill guide barrels should be placed. This will guide implant insertion.

Once fixated (minimum two locations). Punch the cortex using the 2.5mm drill (use the 2.0mm drill for the fibula hook drill guide).

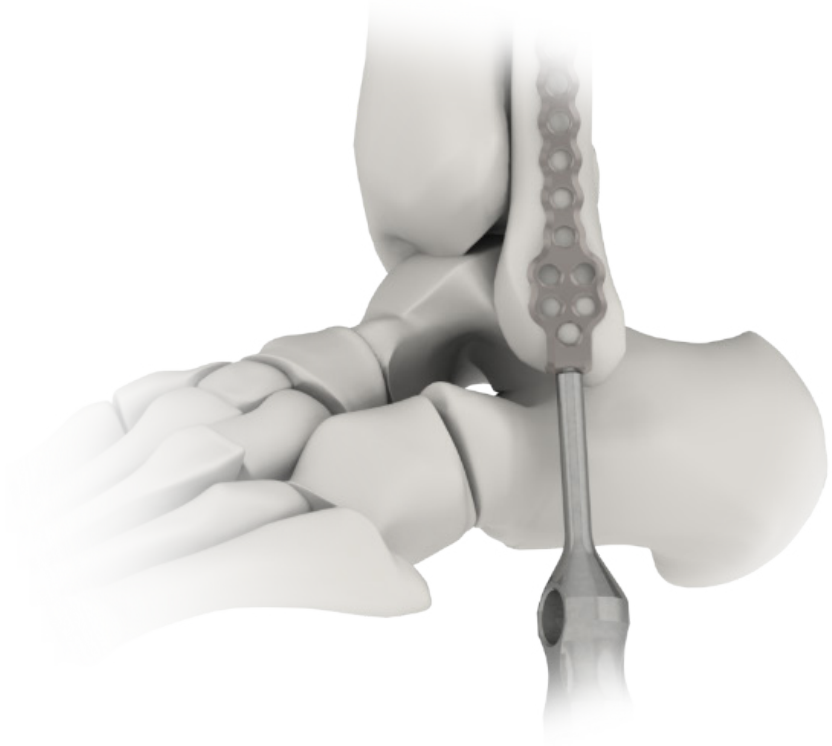
After drilling, remove all fixation wires/tacks EXCEPT for the K-Wire in the hole adjacent to the drill guide barrels. Remove the drill guide by sliding it off the K-Wire inserted adjacent to the drill barrels.

The hook plate tamp instrument is to be threaded onto the hook plate implant in the screw hole near the tines.

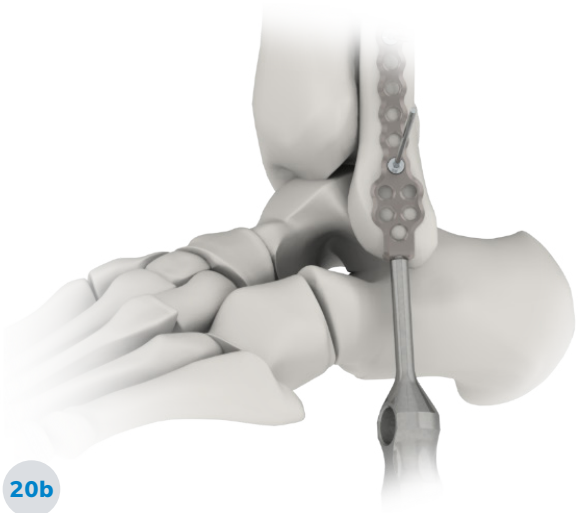
Slide the hook plate tamp over the K-Wire that was used with the hook plate drill guide. This will help align the plate with the pilot holes created for the tines. Slide the plate up to the bone until the pilot holes are located. A mallet can be used to tamp the implant into place.

Once tamped into place, apply temporary fixation to hold the plate in the intended location. (Figure 19).

Surgical Technique - Fibular Hook Plate



20a



20b

The use of fluoroscopic imaging during plate placement in both the AP and lateral planes is recommended.

Plate tacks can be used to secure the plate to bone. Confirm plate placement using temporary fixation.

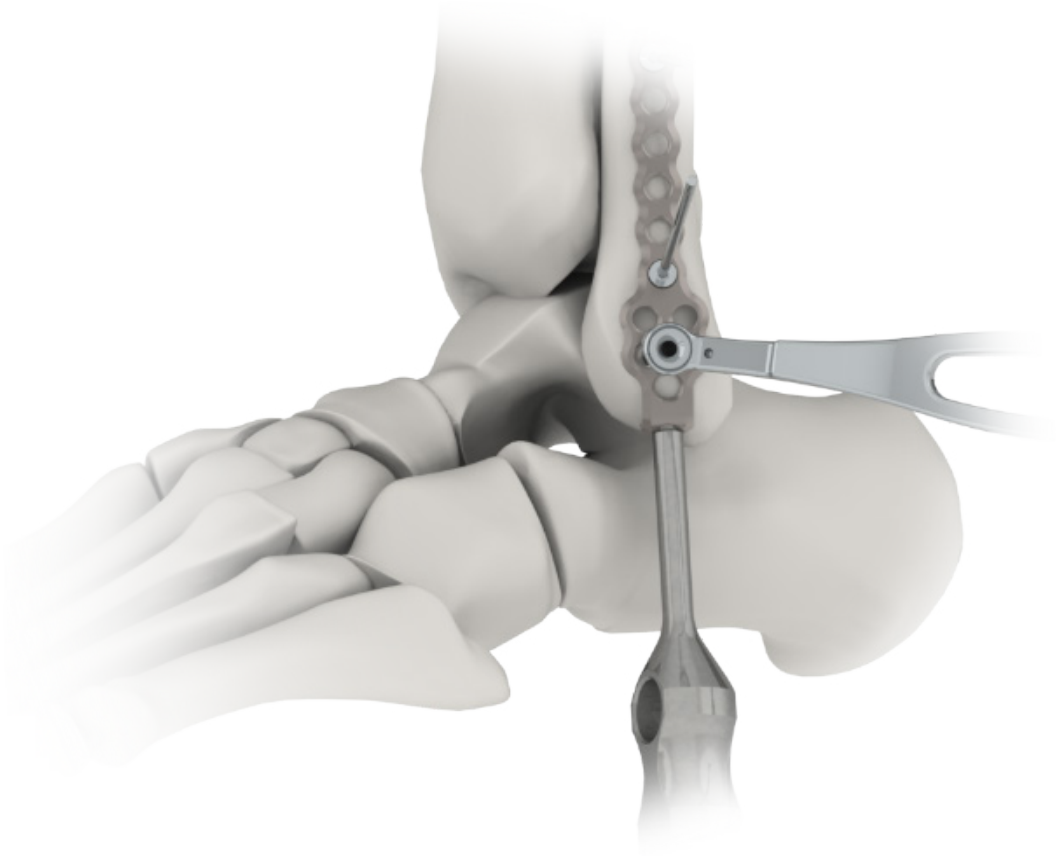
Based on the fracture site, select a locking hole to insert the first screw into and identify the proper screw for fixation.

All plate holes accept 2.7 mm, 3.5 mm (locking or non-locking) or 4.0 mm (non-locking) screws.

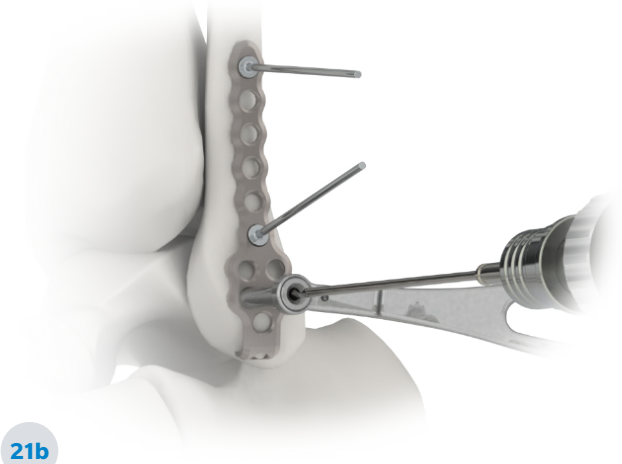
Select the appropriately sized drill guide (770004270 /770006270 / 770004350 / 770006350) based on screw diameter and place it in the chosen hole (Figure 20a, 20b).

Optionally, users may use the corresponding Overdrill (770003270 / 770003350 / 770003400) or Countersink (770008270) if required for the desired indication.

Surgical Technique - Fibular Hook Plate



21a



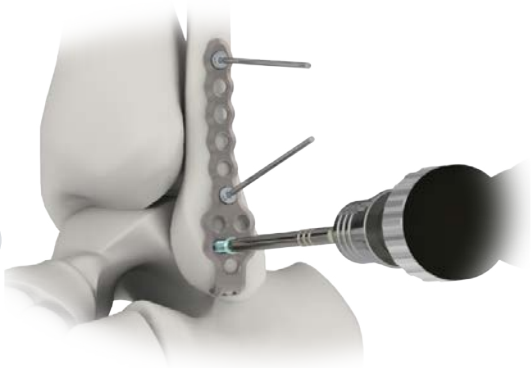
21b

Drill to the desired depth using the appropriate drill for the desired screw diameter.

If using the ThreadIn/Fixed Drill Guide, screw length can be measured by either using the Depth Gauge (770009270) or by using the Thread In Drill Guide to read the measurement marks from the drill.

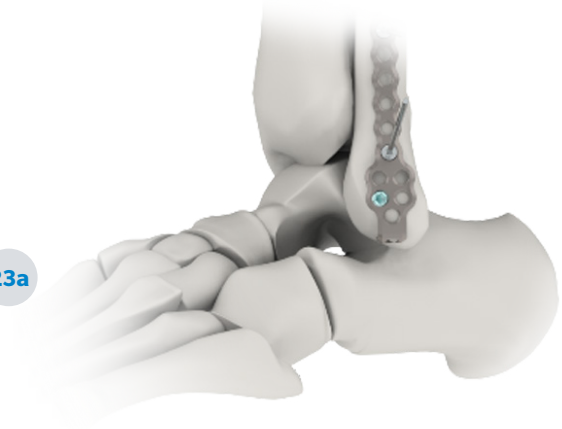
If using either side of the Double Drill Guide, screw length can only be measured using the Depth Gauge corresponding to desired screw diameter (Figure 21a, 21b).

Surgical Technique - Fibular Hook Plate



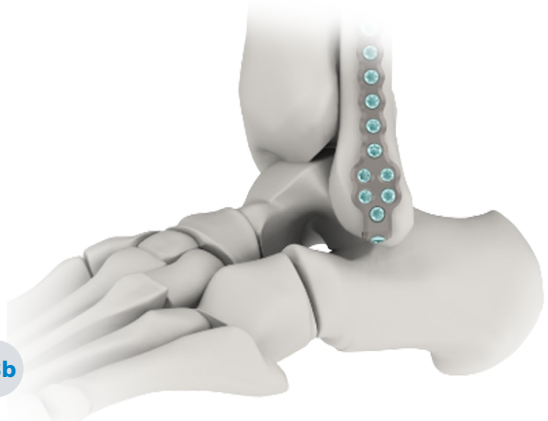
22

Connect the corresponding driver to the Ratcheting AO Handle (770017010) to advance and seat the screw. (Figure 22)



23a

Fill the desired remaining screw holes following the above technique. (Figure 23a, 23b)



23b

Surgical Technique - Anterolateral Tibia Plate

24

Make a small distal medial incision over the tibia, with percutaneous incision(s) made for proximal fixation. Continue along the incised area with soft tissue dissection to allow exposure of the fracture site.

Expose and clean the fracture site and reduce the fracture. It is critical that fibular length, alignment, and rotation are accurately restored in the fracture reduction. Provisional reduction can be maintained with k-wires or reduction forceps, per surgeon preference. Once adequate reduction has been maintained, select the appropriate anterolateral tibia plate for the fracture type and size (Figure 24).

25

The use of fluoroscopic imaging during plate placement in both the AP and lateral planes is recommended.

Plate tacks can be used to secure the plate to bone. Confirm plate placement using temporary fixation (Figure 25).

Optionally, users may use the corresponding Overdrill (770003270 / 770003350 / 770003400) or Countersink (770008270) if required for the desired indication.

Surgical Technique - Anterolateral Tibia Plate

26

27

28

Based on the fracture site, select a locking hole to insert the first screw into and identify the proper screw for fixation.

All plate holes accept 2.7 mm, 3.5 mm (locking or non-locking) or 4.0 mm (non-locking) screws.

Select the appropriately sized drill guide (770004270 /770006270 / 770004350 / 770006350) based on screw diameter and place it in the chosen hole

Drill to the desired depth using the appropriate drill for the desired screw diameter.

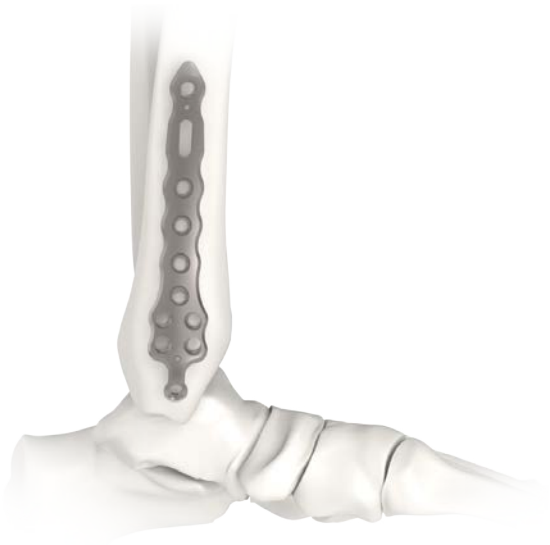
If using the ThreadIn/Fixed Drill Guide, screw length can be measured by either using the Depth Gauge (770009270) or by using the Thread In Drill Guide to read the measurement marks from the drill.

If using either side of the Double Drill Guide, screw length can only be measured using the Depth Gauge corresponding to desired screw diameter.

Connect the corresponding driver to the Ratcheting AO Handle (770017010) to advance and seat the screw (Figure 26 & 27).

Fill the desired remaining screw holes following the above technique (Figure 28).

Surgical Technique - Medial Tibia Plate

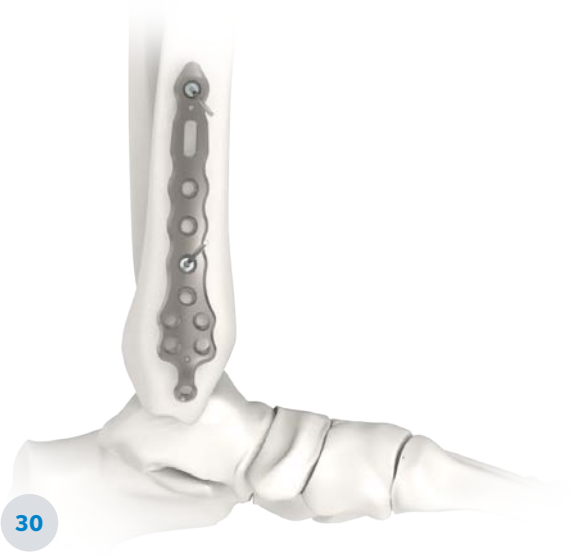


29

Make a straight medial surgical incision over the medial aspect of the tibia. Continue along the incised area with soft tissue dissection to allow exposure of the fracture site.

Expose and clean the fracture site and reduce the fracture. It is critical that fibular length, alignment, and rotation are accurately restored in the fracture reduction. Provisional reduction can be maintained with k-wires or reduction forceps, per surgeon preference.

Once adequate reduction has been maintained, select the appropriate medial tibia plate for the fracture type and size (Figure 29).



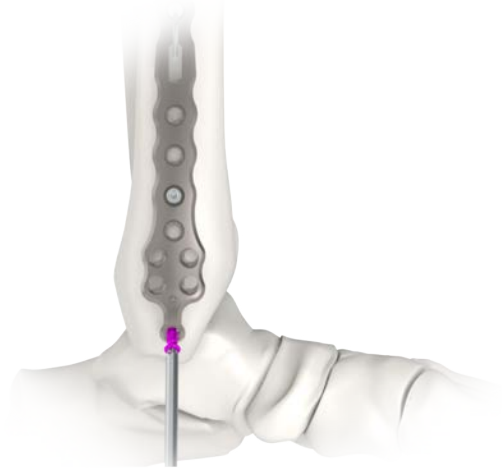
30

The use of fluoroscopic imaging during plate placement in both the AP and lateral planes is recommended.

Plate tacks can be used to secure the plate to bone. Confirm plate placement using temporary fixation (Figure 30).

Optionally, users may use the corresponding Overdrill (770003270 / 770003350 / 770003400) or Countersink (770008270) if required for the desired indication.

Surgical Technique - Medial Tibia Plate



31

Based on the fracture site, select a locking hole to insert the first screw into and identify the proper screw for fixation.

All plate holes accept 2.7 mm, 3.5 mm (locking or non-locking) or 4.0 mm (non-locking) screws.

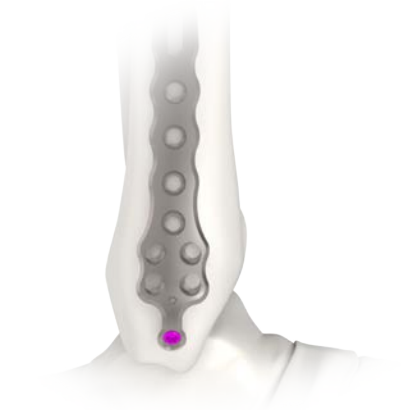
elect the appropriately sized drill guide (770004270 /770006270 / 770004350 / 770006350) based on screw diameter and place it in the chosen hole

Drill to the desired depth using the appropriate drill for the desired screw diameter.

If using the ThreadIn/Fixed Drill Guide, screw length can be measured by either using the Depth Gauge (770009270) or by using the Thread In Drill Guide to read the measurement marks from the drill.

If using either side of the Double Drill Guide, screw length can only be measured using the Depth Gauge corresponding to desired screw diameter.

Connect the corresponding driver to the Ratcheting AO Handle (770017010) to advance and seat the screw (Figure 31 & 32).

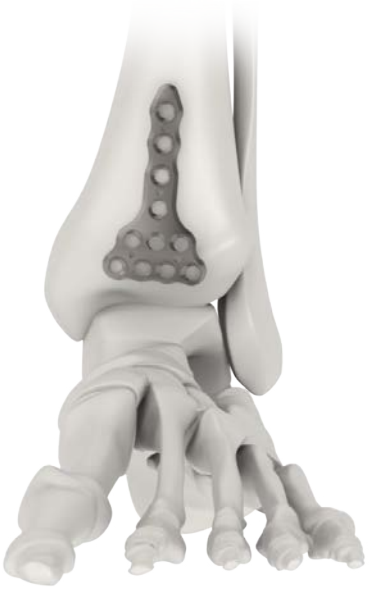


32

33

Fill the desired remaining screw holes following the above technique (Figure 33).

Surgical Technique - Anterior Tibia Plate

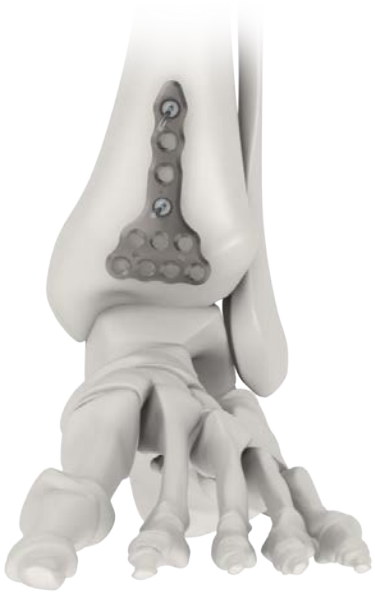


34

Make a straight anterior incision over the tibia. Continue along the incised area with soft tissue dissection to allow exposure of the fracture site.

Expose and clean the fracture site and reduce the fracture. It is critical that fibular length, alignment, and rotation are accurately restored in the fracture reduction. Provisional reduction can be maintained with k-wires or reduction forceps, per surgeon preference.

Once adequate reduction has been maintained, select the appropriate anterior tibia plate for the fracture type and size (Figure 34).



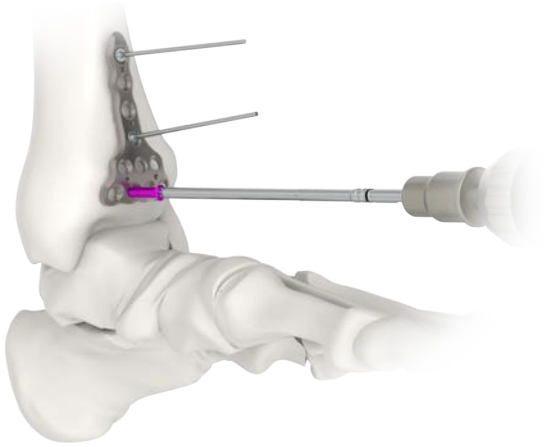
35

The use of fluoroscopic imaging during plate placement in both the AP and lateral planes is recommended.

Plate tacks can be used to secure the plate to bone. Confirm plate placement using temporary fixation (Figure 35).

Optionally, users may use the corresponding Overdrill (770003270 / 770003350 / 770003400) or Countersink (770008270) if required for the desired indication.

Surgical Technique - Anterior Tibia Plate



36

Based on the fracture site, select a locking hole to insert the first screw into and identify the proper screw for fixation.

All plate holes accept 2.7 mm, 3.5 mm (locking or non-locking) or 4.0 mm (non-locking) screws.

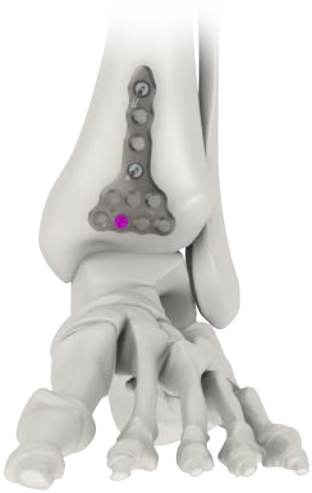
Select the appropriately sized drill guide (770004270 /770006270 /770004350 / 770006350) based on screw diameter and place it in the chosen hole .

Drill to the desired depth using the appropriate drill for the desired screw diameter.

If using the ThreadIn/Fixed Drill Guide, screw length can be measured by either using the Depth Gauge (770009270) or by using the Thread In Drill Guide to read the measurement marks from the drill.

If using either side of the Double Drill Guide, screw length can only be measured using the Depth Gauge corresponding to desired screw diameter.

Connect the corresponding driver to the Ratcheting AO Handle (770017010) to advance and seat the screw (Figure 36 & 37).

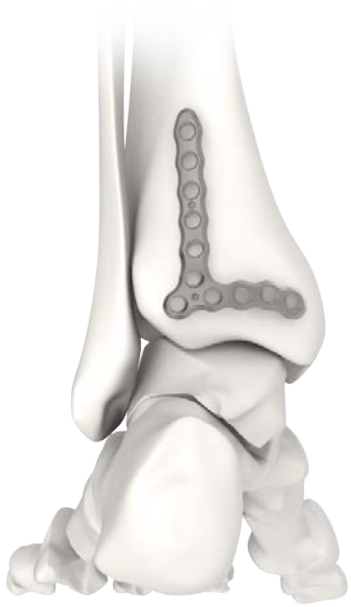


37

38

Fill the desired remaining screw holes following the above technique (Figure 38).

Surgical Technique - Posterolateral Tibia Plate

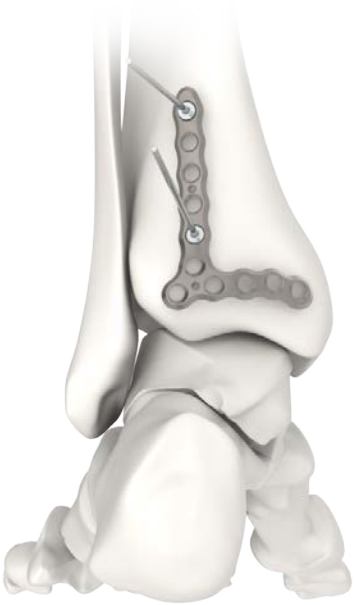


39

Make a posterolateral surgical incision over the tibia. Continue along the incised area with soft tissue dissection to allow exposure of the fracture site.

Expose and clean the fracture site and reduce the fracture. It is critical that fibular length, alignment, and rotation are accurately restored in the fracture reduction. Provisional reduction can be maintained with K-Wires or reduction forceps, per surgeon preference.

Once adequate reduction has been maintained, select the appropriate posterolateral tibia plate for the fracture type and size (Figure 39).



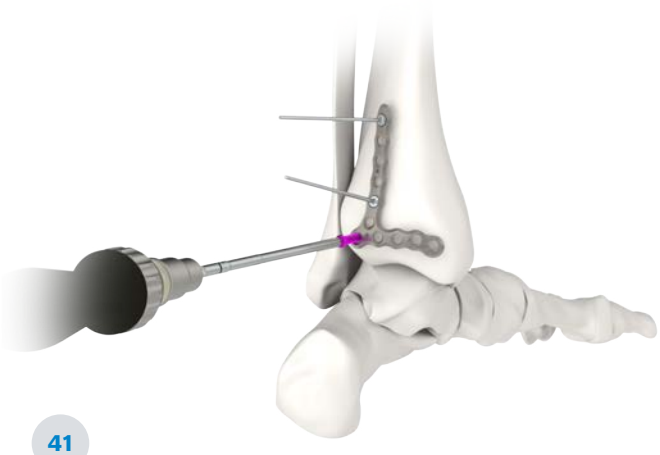
40

The use of fluoroscopic imaging during plate placement in both the AP and lateral planes is recommended.

Plate tacks can be used to secure the plate to bone. Confirm plate placement using temporary fixation (Figure 40).

Optionally, users may use the corresponding Overdrill (770003270 / 770003350 / 770003400) or Countersink(770008270) if required for the desired indication.

Surgical Technique - Posterolateral Tibia Plate



41

Based on the fracture site, select a locking hole to insert the first screw into and identify the proper screw for fixation.

All plate holes accept 2.7 mm, 3.5 mm (locking or non-locking) or 4.0 mm (non-locking) screws.

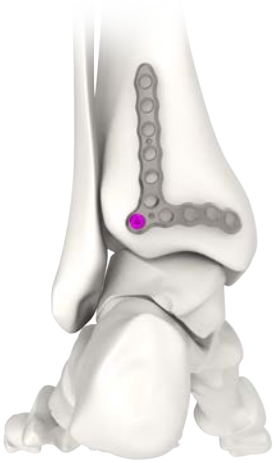
Select the appropriately sized drill guide (770004270 /770006270 / 770004350 / 770006350) based on screw diameter and place it in the chosen hole.

Drill to the desired depth using the appropriate drill for the desired screw diameter.

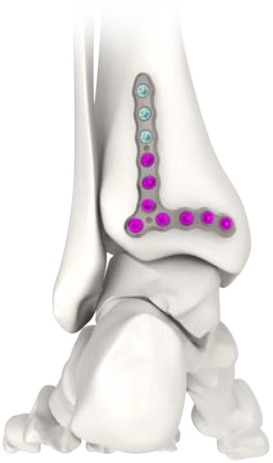
If using the ThreadIn/Fixed Drill Guide, screw length can be measured by either using the Depth Gauge (770009270) or by using the Thread In Drill Guide to read the measurement marks from the drill.

If using either side of the Double Drill Guide, screw length can only be measured using the Depth Gauge corresponding to desired screw diameter.

Connect the corresponding driver to the Ratcheting AO Handle (770017010) to advance and seat the screw (Figure 41 & 42).



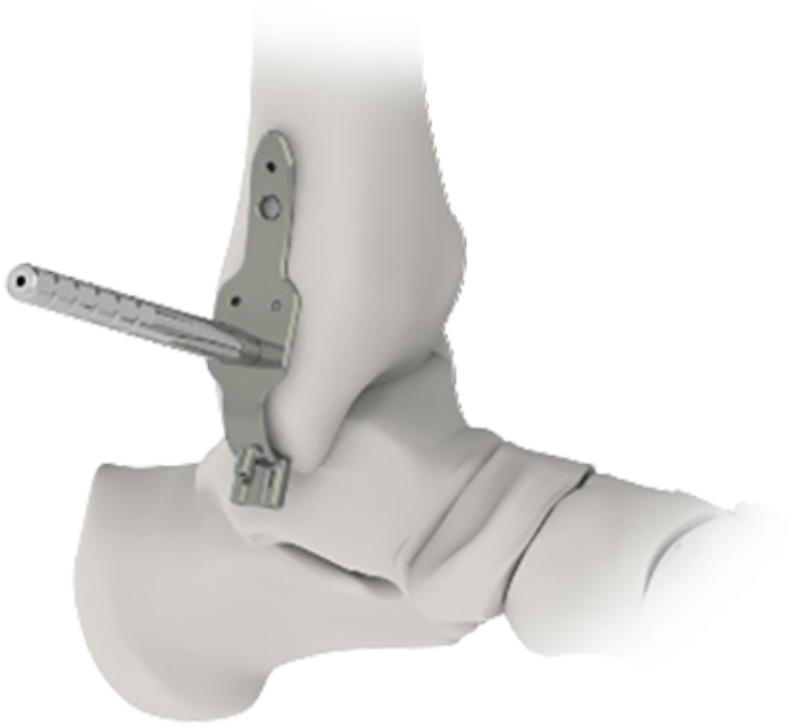
42



43

Fill the desired remaining screw holes following the above technique (Figure 43).

Surgical Technique - Medial Malleolus Hook Plate



44

Make a longitudinal incision over the central aspect of the medial malleolus. Continue along the incised area with soft tissue dissection to allow exposure of the fracture site.

Expose and clean the fracture site and reduce the fracture. It is critical that fibular length, alignment, and rotation are accurately restored in the fracture reduction. Provisional reduction can be maintained with k-wires or reduction forceps, per surgeon preference.

Once adequate reduction has been maintained, select the appropriate medial malleolus hook plate for the fracture type and size. The drill guide is used as a template to determine implant positioning. A bending pin can be used as a handle for easier placement.

Once the desired placement is achieved, the guide must be secured in two locations using K-Wires or plate tacks. A K-Wire through the hole adjacent to the drill guide barrels should be placed. This will guide implant insertion.

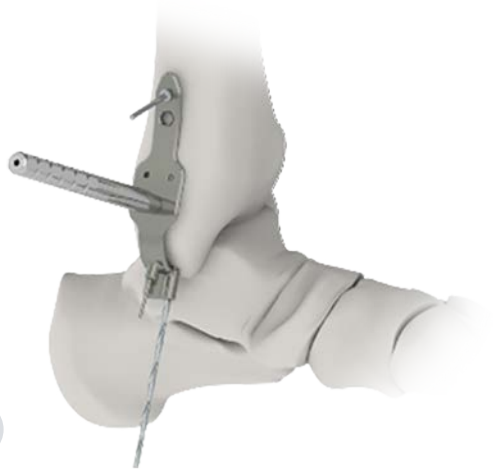
Once fixated (minimum two locations). Punch the cortex using the 2.5mm drill (use the 2.0mm drill for the fibula hook drill guide).

After drilling, remove all fixation wires/tacks EXCEPT for the K-Wire in the hole adjacent to the drill guide barrels. Remove the drill guide by sliding it off the K-Wire inserted adjacent to the drill barrels.

The hook plate tamp instrument is to be threaded onto the hook plate implant in the screw hole near the tines. Slide the hook plate tamp over the K-Wire that was used with the hook plate drill guide. This will help align the plate with the pilot holes created for the tines. Slide the plate up to the bone until the pilot holes are located. A mallet can be used to tamp the implant into place.

Once tamped into place, apply temporary fixation to hold the plate in the intended location (Figure 44).

Surgical Technique - Medial Malleolus Hook Plate



45

The use of fluoroscopic imaging during plate placement in both the AP and lateral planes is recommended.

Plate tacks can be used to secure the plate to bone. Confirm plate placement using temporary fixation (Figure 45).

46

Based on the fracture site, select a locking hole to insert the first screw into and identify the proper screw for fixation.

All plate holes accept 2.7 mm, 3.5 mm (locking or non-locking) or 4.0 mm (non-locking) screws.

Select the appropriately sized drill guide (770004270 /770006270 / 770004350 / 770006350) based on screw diameter and place it in the chosen hole (Figure 46).

Optionally, users may use the corresponding Overdrill 770003270 / 770003350 / 770003400) or Countersink(770008270) if required for the desired indication.

47

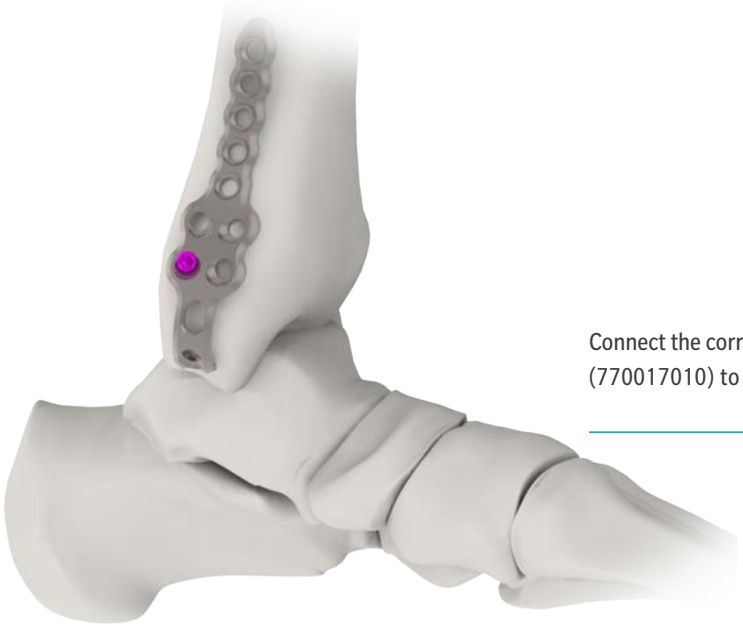
Drill to the desired depth using the appropriate drill for the desired screw diameter.

If using the ThreadIn/Fixed Drill Guide, screw length can be measured by either using the Depth Gauge (770009270) or by using the Thread In Drill Guide to read the measurement marks from the drill.

If using either side of the Double Drill Guide, screw length can only be measured using the Depth Gauge corresponding to desired screw diameter (Figure 47).

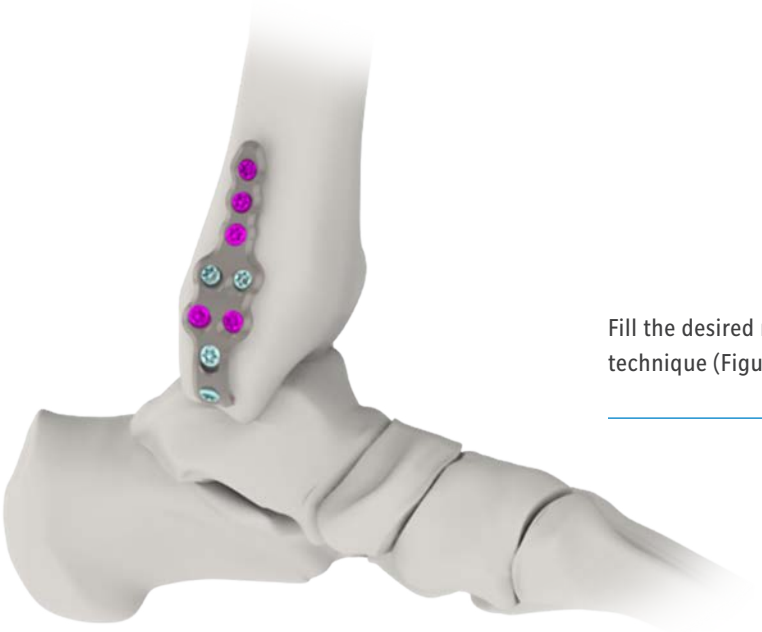
Surgical Technique - Medial Malleolus Hook Plate

48



Connect the corresponding driver to the Ratcheting AO Handle (770017010) to advance and seat the screw (Figure 48).

49



Fill the desired remaining screw holes following the above technique (Figure 49).

Postoperative Care

Early range of motion exercises of the ankle are encouraged. Allow toe-touch weight bearing to progress to full weight bearing as fracture callus increases on the x-ray films. It is the responsibility of the surgeon to determine what is the most suitable postoperative care depending on each patient's health condition.

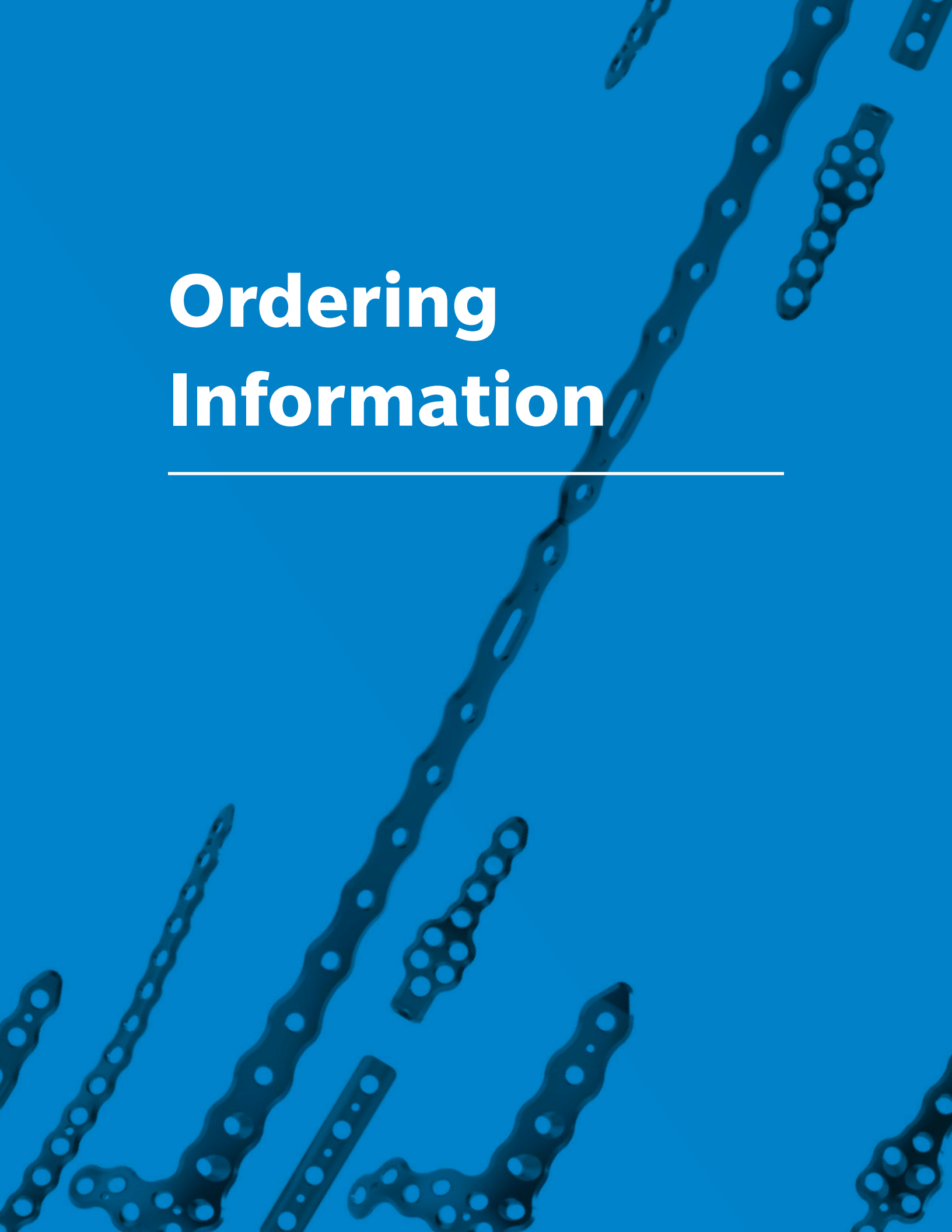
Implant Removal

To remove locking screws, use the T-15 Driver. First unlock all screws from the plate and then remove screws completely. Please refer to the package insert for product information, including contraindications, warnings, and precautionary information.

References

1. ZipTight Ankle Syndesmosis Surgical Technique (2265.1-GLBL-en-REV0419)
2. JuggerLoc Ankle Syndesmosis Surgical Technique (1326.1-US-en-REV1117)

Ordering Information



Ordering Information

2.7 mm Non-Locking Screws

Part#	Description
770270010	2.7mm Non-Locking Screw 10mm
770270012	2.7mm Non-Locking Screw 12mm
770270014	2.7mm Non-Locking Screw 14mm
770270016	2.7mm Non-Locking Screw 16mm
770270018	2.7mm Non-Locking Screw 18mm
770270020	2.7mm Non-Locking Screw 20mm
770270022	2.7mm Non-Locking Screw 22mm
770270024	2.7mm Non-Locking Screw 24mm
770270026	2.7mm Non-Locking Screw 26mm
770270028	2.7mm Non-Locking Screw 28mm
770270030	2.7mm Non-Locking Screw 30mm
770270032	2.7mm Non-Locking Screw 32mm
770270034	2.7mm Non-Locking Screw 34mm
770270036	2.7mm Non-Locking Screw 36mm
770270038	2.7mm Non-Locking Screw 38mm
770270040	2.7mm Non-Locking Screw 40mm
770270042	2.7mm Non-Locking Screw 42mm
770270044	2.7mm Non-Locking Screw 44mm
770270046	2.7mm Non-Locking Screw 46mm
770270048	2.7mm Non-Locking Screw 48mm
770270050	2.7mm Non-Locking Screw 50mm
770270055	2.7mm Non-Locking Screw 55mm
770270060	2.7mm Non-Locking Screw 60mm

2.7 mm Non-Locking Screws

Part#	Description
770270065	2.7mm Non-Locking Screw 65mm
770270070	2.7mm Non-Locking Screw 70mm
770270075	2.7mm Non-Locking Screw 75mm
770270080	2.7mm Non-Locking Screw 80mm
770270085	2.7mm Non-Locking Screw 85mm
770270090	2.7mm Non-Locking Screw 90mm
770270095	2.7mm Non-Locking Screw 95mm
770270100	2.7mm Non-Locking Screw 100mm

Ordering Information

2.7 mm Locking Screws

Part#	Description
770271010	2.7mm Locking MDS 10mm
770271012	2.7mm Locking MDS 12mm
770271014	2.7mm Locking MDS 14mm
770271016	2.7mm Locking MDS 16mm
770271018	2.7mm Locking MDS 18mm
770271020	2.7mm Locking MDS 20mm
770271022	2.7mm Locking MDS 22mm
770271024	2.7mm Locking MDS 24mm
770271026	2.7mm Locking MDS 26mm
770271028	2.7mm Locking MDS 28mm
770271030	2.7mm Locking MDS 30mm
770271032	2.7mm Locking MDS 32mm
770271034	2.7mm Locking MDS 34mm
770271036	2.7mm Locking MDS 36mm
770271038	2.7mm Locking MDS 38mm
770271040	2.7mm Locking MDS 40mm
770271042	2.7mm Locking MDS 42mm
770271044	2.7mm Locking MDS 44mm
770271046	2.7mm Locking MDS 46mm
770271048	2.7mm Locking MDS 48mm
770271050	2.7mm Locking MDS 50mm
770271055	2.7mm Locking MDS 55mm
770271060	2.7mm Locking MDS 60mm

2.7 mm Locking Screws

Part#	Description
770271065	2.7mm Locking MDS 65mm
770271070	2.7mm Locking MDS 70mm
770271075	2.7mm Locking MDS 75mm
770271080	2.7mm Locking MDS 80mm
770271085	2.7mm Locking MDS 85mm
770271090	2.7mm Locking MDS 90mm
770271095	2.7mm Locking MDS 95mm
770271100	2.7mm Locking MDS 100mm

Ordering Information

3.5 mm Non-Locking Screws

Part#	Description
770350010	3.5mm Non-Locking Screw 10mm
770350012	3.5mm Non-Locking Screw 12mm
770350014	3.5mm Non-Locking Screw 14mm
770350016	3.5mm Non-Locking Screw 16mm
770350018	3.5mm Non-Locking Screw 18mm
770350020	3.5mm Non-Locking Screw 20mm
770350022	3.5mm Non-Locking Screw 22mm
770350024	3.5mm Non-Locking Screw 24mm
770350026	3.5mm Non-Locking Screw 26mm
770350028	3.5mm Non-Locking Screw 28mm
770350030	3.5mm Non-Locking Screw 30mm
770350032	3.5mm Non-Locking Screw 32mm
770350034	3.5mm Non-Locking Screw 34mm
770350036	3.5mm Non-Locking Screw 36mm
770350038	3.5mm Non-Locking Screw 38mm
770350040	3.5mm Non-Locking Screw 40mm
770350042	3.5mm Non-Locking Screw 42mm
770350044	3.5mm Non-Locking Screw 44mm
770350046	3.5mm Non-Locking Screw 46mm
770350048	3.5mm Non-Locking Screw 48mm
770350050	3.5mm Non-Locking Screw 50mm
770350055	3.5mm Non-Locking Screw 55mm
770350060	3.5mm Non-Locking Screw 60mm

3.5 mm Non-Locking Screws

Part#	Description
770350065	3.5mm Non-Locking Screw 65mm
770350070	3.5mm Non-Locking Screw 70mm
770350075	3.5mm Non-Locking Screw 75mm
770350080	3.5mm Non-Locking Screw 80mm
770350085	3.5mm Non-Locking Screw 85mm
770350090	3.5mm Non-Locking Screw 90mm
770350095	3.5mm Non-Locking Screw 95mm
770350100	3.5mm Non-Locking Screw 100mm

Ordering Information

3.5 mm Locking Screws

Part#	Description
770351010	3.5mm Locking MDS 10mm
770351012	3.5mm Locking MDS 12mm
770351014	3.5mm Locking MDS 14mm
770351016	3.5mm Locking MDS 16mm
770351018	3.5mm Locking MDS 18mm
770351020	3.5mm Locking MDS 20mm
770351022	3.5mm Locking MDS 22mm
770351024	3.5mm Locking MDS 24mm
770351026	3.5mm Locking MDS 26mm
770351028	3.5mm Locking MDS 28mm
770351030	3.5mm Locking MDS 30mm
770351032	3.5mm Locking MDS 32mm
770351034	3.5mm Locking MDS 34mm
770351036	3.5mm Locking MDS 36mm
770351038	3.5mm Locking MDS 38mm
770351040	3.5mm Locking MDS 40mm
770351042	3.5mm Locking MDS 42mm
770351044	3.5mm Locking MDS 44mm
770351046	3.5mm Locking MDS 46mm
770351048	3.5mm Locking MDS 48mm
770351050	3.5mm Locking MDS 50mm
770351055	3.5mm Locking MDS 55mm
770351060	3.5mm Locking MDS 60mm

3.5 mm Locking Screws

Part#	Description
770351065	3.5mm Locking MDS 65mm
770351070	3.5mm Locking MDS 70mm
770351075	3.5mm Locking MDS 75mm
770351080	3.5mm Locking MDS 80mm
770351085	3.5mm Locking MDS 85mm
770351090	3.5mm Locking MDS 90mm
770351095	3.5mm Locking MDS 95mm
770351100	3.5mm Locking MDS 100mm

Ordering Information

4.0 mm Non-Locking Screws

Part#	Description
770400010	4.0mm Non-Locking Screw 10mm
770400012	4.0mm Non-Locking Screw 12mm
770400014	4.0mm Non-Locking Screw 14mm
770400016	4.0mm Non-Locking Screw 16mm
770400018	4.0mm Non-Locking Screw 18mm
770400020	4.0mm Non-Locking Screw 20mm
770400022	4.0mm Non-Locking Screw 22mm
770400024	4.0mm Non-Locking Screw 24mm
770400026	4.0mm Non-Locking Screw 26mm
770400028	4.0mm Non-Locking Screw 28mm
770400030	4.0mm Non-Locking Screw 30mm
770400032	4.0mm Non-Locking Screw 32mm
770400034	4.0mm Non-Locking Screw 34mm
770400036	4.0mm Non-Locking Screw 36mm
770400038	4.0mm Non-Locking Screw 38mm
770400040	4.0mm Non-Locking Screw 40mm
770400042	4.0mm Non-Locking Screw 42mm
770400044	4.0mm Non-Locking Screw 44mm
770400046	4.0mm Non-Locking Screw 46mm
770400048	4.0mm Non-Locking Screw 48mm
770400050	4.0mm Non-Locking Screw 50mm
770400055	4.0mm Non-Locking Screw 55mm
770400060	4.0mm Non-Locking Screw 60mm

4.0 mm Non-Locking Screws

Part#	Description
770400065	4.0mm Non-Locking Screw 65mm
770400070	4.0mm Non-Locking Screw 70mm
770400075	4.0mm Non-Locking Screw 75mm
770400080	4.0mm Non-Locking Screw 80mm
770400085	4.0mm Non-Locking Screw 85mm
770400090	4.0mm Non-Locking Screw 90mm
770400095	4.0mm Non-Locking Screw 95mm
770400100	4.0mm Non-Locking Screw 100mm

Anatomic Lateral Fibula Plates

Part#	Description
770708041	Anatomic Lat Fib Plate 4H LT
770708042	Anatomic Lat Fib Plate 4H RT
770708061	Anatomic Lat Fib Plate 6H LT
770708062	Anatomic Lat Fib Plate 6H RT
770708081	Anatomic Lat Fib Plate 8H LT
770708082	Anatomic Lat Fib Plate 8H RT
770708101	Anatomic Lat Fib Plate 10H LT
770708102	Anatomic Lat Fib Plate 10H RT
770708121	Anatomic Lat Fib Plate 12H LT
770708122	Anatomic Lat Fib Plate 12H RT

Ordering Information

Anatomic Lateral Fibula Plates

Part#	Description
770708041	Anatomic Lat Fib Plate 4H LT
770708042	Anatomic Lat Fib Plate 4H RT
770708061	Anatomic Lat Fib Plate 6H LT
770708062	Anatomic Lat Fib Plate 6H RT
770708081	Anatomic Lat Fib Plate 8H LT
770708082	Anatomic Lat Fib Plate 8H RT
770708101	Anatomic Lat Fib Plate 10H LT
770708102	Anatomic Lat Fib Plate 10H RT
770708121	Anatomic Lat Fib Plate 12H LT
770708122	Anatomic Lat Fib Plate 12H RT

Posterior Fibula Plates

Part#	Description
770709081	Posterior Fibula Plate 8H LT
770709082	Posterior Fibula Plate 8H RT
770709101	Posterior Fibula Plate 10H LT
770709102	Posterior Fibula Plate 10H RT
770709141	Posterior Fibula Plate 14H LT
770709142	Posterior Fibula Plate 14H RT

⅓ Tubular Plates

Part#	Description
770711020	⅓ Tubular Plate 2h
770711040	⅓ Tubular Plate 4h
770711060	⅓ Tubular Plate 6h
770711080	⅓ Tubular Plate 8h
770711100	⅓ Tubular Plate 10h
770711120	⅓ Tubular Plate 12h
770711150	⅓ Tubular Plate 15h

Fibula Hook Plates

Part#	Description
770712040	Fibula Hook plate 4H
770712060	Fibula Hook plate 6H

Medial Malleolous Hook Plates

Part#	Description
770720030	Med Malleolous Hook Plate 3H
770720050	Med Malleolous Hook Plate 5H

Ordering Information

Anterolateral Tibia Plates - Narrow

Part#	Description
770713061	Antlateral Tib Plt 6H LT Nrw
770713062	Antlateral Tib Plt 6H RT Nrw
770713101	Antlateral Tib Plt 10H LT Nrw
770713102	Antlateral Tib Plt 10H RT Nrw
770713121	Antlateral Tib Plt 12H LT Nrw
770713122	Antlateral Tib Plt 12H RT Nrw
770713161	Antlateral Tib Plt 16H LT Nrw
770713162	Antlateral Tib Plt 16H RT Nrw

Anterolateral Tibia Plates - Wide

Part#	Description
770714061	Antlateral Tib Plt 6H LT Wide
770714062	Antlateral Tib Plt 6h RT Wide
770714101	Antlateral Tib Plt 10h LT Wide
770714102	Antlateral Tib Plt 10h RT Wide
770714121	Antlateral Tib Plt 12h LT Wide
770714122	Antlateral Tib Plt 12h RT Wide
770714161	Antlateral Tib Plt 16h LT Wide
770714162	Antlateral Tib Plt 16h RT Wide

Medial Tibia Plates

Part#	Description
770715061	Medial Tibia Plate 6H LT
770715062	Medial Tibia Plate 6H RT
770715101	Medial Tibia Plate 10H LT
770715102	Medial Tibia Plate 10H RT
770715121	Medial Tibia Plate 12H LT
770715122	Medial Tibia Plate 12H RT
770715161	Medial Tibia Plate 16H LT
770715162	Medial Tibia Plate 16H RT

Posterolateral Tibia Plates

Part#	Description
770718421	Postlat Tibia Plate 4-2H LT
770718422	Postlat Tibia Plate 4-2H RT
770718441	Postlat Tibia Plate 4-4H LT
770718442	Postlat Tibia Plate 4-4H RT
770718451	Postlat Tibia Plate 4-5H LT
770718452	Postlat Tibia Plate 4-5H RT
770718621	Postlat Tibia Plate 6-2H LT
770718622	Postlat Tibia Plate 6-2H RT
770718641	Postlat Tibia Plate 6-4H LT
770718642	Postlat Tibia Plate 6-4H RT
770718651	Postlat Tibia Plate 6-5H LT
770718652	Postlat Tibia Plate 6-5H RT

Ordering Information

Anterior Tibia Plates - Narrow

Part#	Description
770716040	Anterior Tib Plate 4h Narrow
770716060	Anterior Tib Plate 6h Narrow
770716080	Anterior Tib Plate 8h Narrow

Anterior Tibia Plates - Wide

Part#	Description
770717040	Anterior Tib Plate 4h Wide
770717060	Anterior Tib Plate 6h Wide
770717080	Anterior Tib Plate 8h Wide

ALPS mvX Cases & Trays

Part#	Description
00-5900-099-00	Generic Stackable Lid Assy
770104050	Ankle Distal Fibula Plate Tray
770102010	Ankle Distal Fib Plt Tray Lid
770103050	Ankle Screw Rack
770107050	Ankle Screw Rack Lid
770101040	Ankle Outer Case 2
770101030	Ankle Outer Case 1
770105040	Ankle Instrument Tray 1
770105050	Ankle Instrument Tray 2

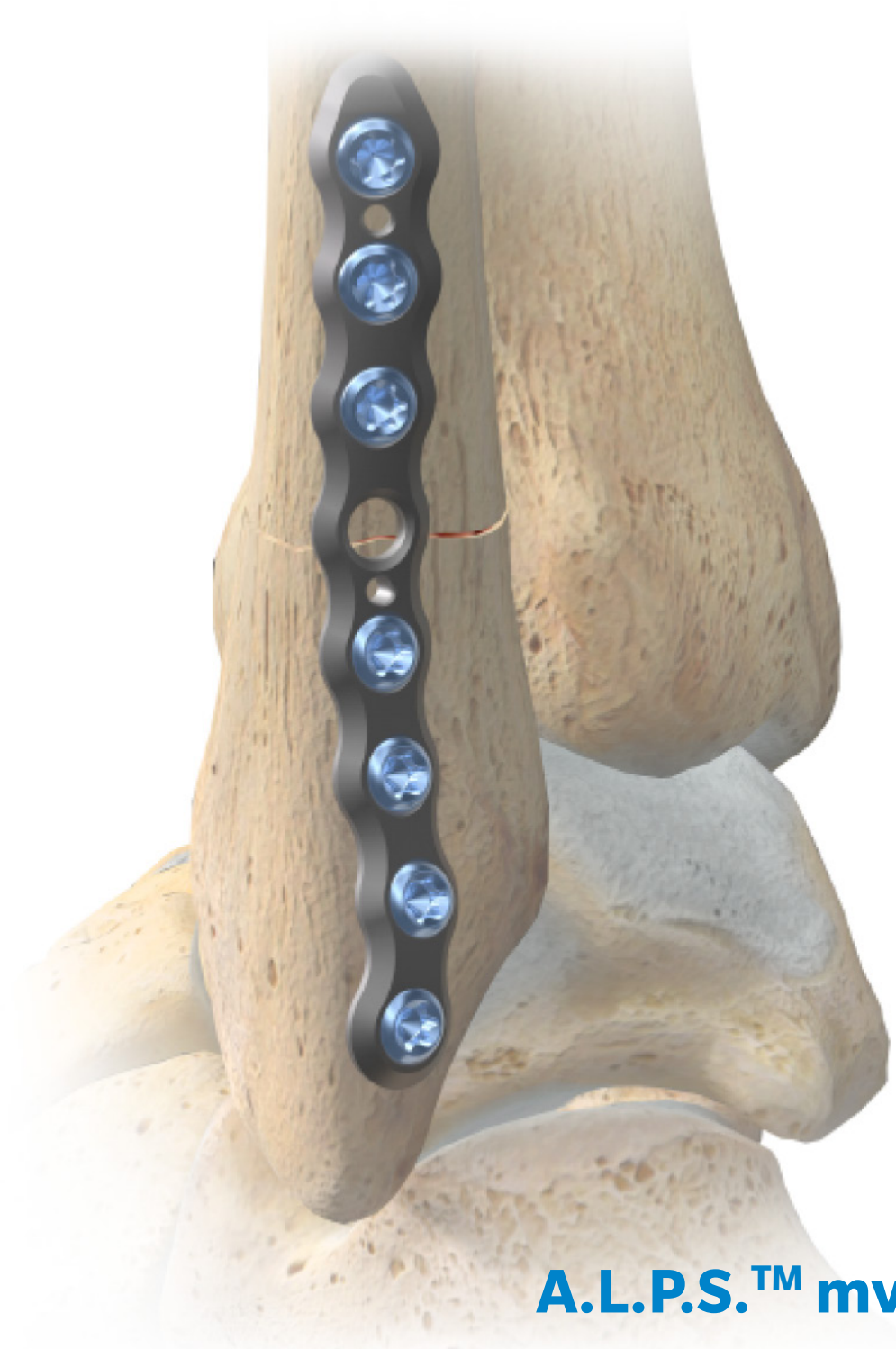
Ordering Information

ALPS mvX Cases & Trays

Part#	Description
770009270	2.7/3.5/4.0mm Depth Gauge
770004270	Threadin/Fixed 2.7mm Drl Gde
770013020	Fibula Hook Plate Drill Guide
770012010	Hook Plate Tamp
770013010	Medial Malleolus Drill Guide
770020020	Plate Cutters
770006270	2.0mm Fixed Angle/Va Dbl Drl Gde
770025010	Plate Distractor
770017010	Ratcheting AO Handle
770007270	2.0/2.7mm Overdrill Guide
770004350	Threadin/Fixed 2.5mm Drl Gde
770006350	2.5mm Fx Ang/Va Dbl Drl Gd
770007350	2.5/3.5mm Overdrill Guide
770007400	2.5/4.0mm Overdrill Guide
770016270	2.7/3.5/4.0mm Bending Pin
770003350	3.5mm Overdrill
770003400	4.0mm Overdrill
770001151	T15 Retention Driver Long
770008270	2.7/3.5/4.0mm Countersink
770015240	2.0/2.4/2.7/3.5/4.0mm Plate Tk
770018160	1.6mm K-Wire 6 In
770002200	2.0mm Drill Short
770002251	2.5mm Drill Long

ALPS mvX Cases & Trays

Part#	Description
770002250	2.5mm Drill Short
770003270	2.7mm Overdrill
770002201	2.0mm Drill Long
13573	Reduct Forcep W/Jaw
13572	Sharp Hook
13566	Periosteal Elevator
MHR	Retractor Mini Hohmann
13577	Reduct Forcep W/Points Lg
824129000	Bending Iron 3.5mm
214213568	Reduct Forcep W/Points
770800027	2.7mm Screw Washer
770800035	3.5mm Screw Washer
770800040	4.0mm Screw Washer



A.L.P.S.™ mvX Ankle

Fracture System

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4631.1-US-en-Issue Date-2024-03
VV-11064

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