ENG

Integra®

Panta® – Panta® XL

Arthrodesis Nail System

SURGICAL TECHNIQUE

INTEGRA®
LIMIT UNCERTAINTY

Products for sale in Europe, Middle-East and Africa only

Table of Contents

Design rationale PANTA®

The tibio-talo-calcaneal arthrodesis is characterized by its challenging technique. The use of a retrograde nail is part of the therapeutic option that allows:

- Re-alignment of the foot on the weight-bearing axis.
- Correction of coronal and sagittal plane deformities.
- Rotational stability.
- Axial compression.

The Panta® nail system has been designed to best achieve these targets through:

- Precise and radiolucent instrumentation.
- A system to apply compression balanced with multi-planar screw fixation — in the tibia, the talus and the calcaneus — and enhanced calcaneal fixation to optimize stability and alignment of the arthrodesis.

Design rationale PANTA® XL

Incorporated features are longer lengths and a conical extremity shape designed to reduce stress at the proximal tip of the nail.

Another feature is the addition of nail autodynamisation. The proximal edge of the slot maintains compression while allowing dynamisation with postoperative weight bearing, providing continuous compression.

Indications

The PANTA® and PANTA® XL nails are intended for use in tibio-talo-calcaneal arthrodesis and treatment of trauma to the hindfoot
and distal tibia. Depending on the particular patient factors, indications may include:

- Post-traumatic and degenerative arthritis involving both ankle and subtalar joints.
- Rheumatoid arthritis.
- Revision of failed ankle arthrodesis with subtalar involvement or with insufficient talar body.
- Revision of failed total ankle arthroplasty with subtalar intrusion.
- Talar deficiency conditions (requiring a tibiocalcaneal arthrodesis).
- Avascular necrosis of the talus.
- Neuroarthropathy or neuropathic ankle deformity.
- Severe deformity as a result of talipes equinovarus, cerebral vascular accident, paralysis or other neuromuscular disease.
- Severe pilon fractures with trauma to the subtalar joint.

Contraindications

The contraindications of this system are similar to those of other systems of similar design. Contraindications include the following conditions:

Absolute Contraindications:

- Active posterior infection.
- Allergy to titanium.

Relative Contraindications:

- Fever.
- Pregnancy, unless internal fixation of the spine is indicated for unstable fracture.
- Signs of infection in the area to be implanted.
- A patient unwilling or unable to follow instructions.

Implant description

The PANTA® and PANTA® XL nails are available in 14 sizes. All nails are color coded for easy size identification.

Bony fixation is achieved using two tibial screws, two calcaneal screws and one (optional) talar screw.

Two kinds of screws are available:

- Fully threaded screws (FTS) with cortical thread over the entire length providing increased bony fixation.
- Partially Threaded Screw (PTS) with cortical threads on extremities only providing more resistance.

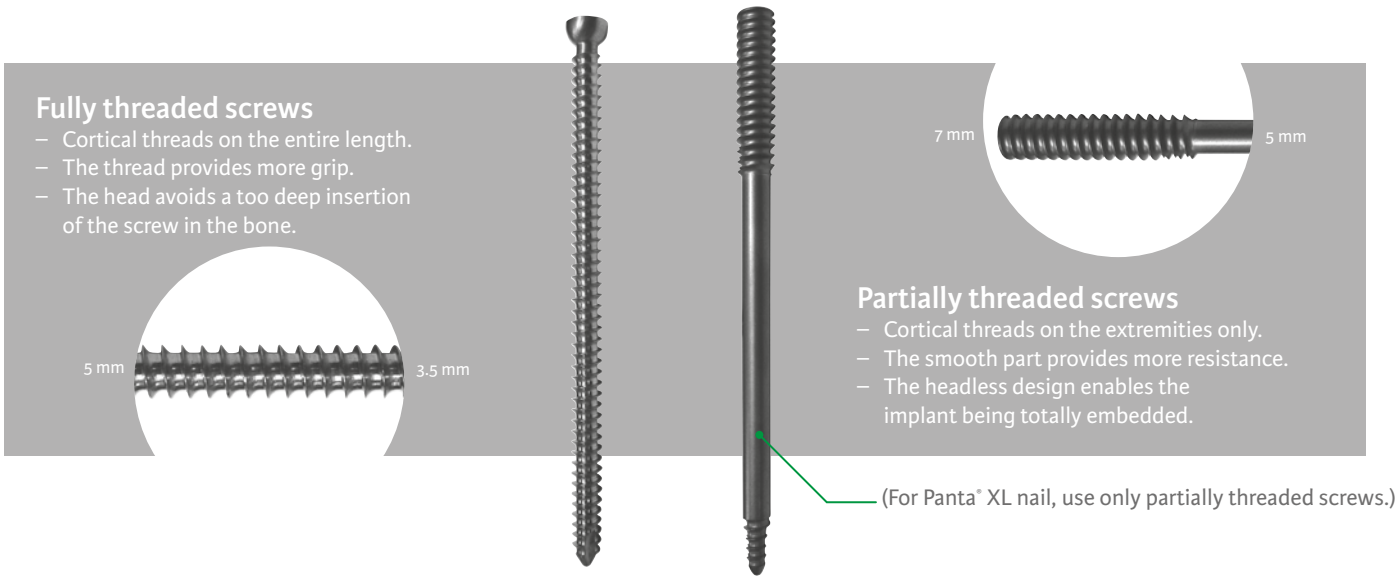
Screws length is available from 20mm to 110mm in 5mm increments.

An end cap may be inserted into the distal nail threads to prevent tissue ingrowth and facilitate future nail removal.

The nail, cross locking screws and end cap are manufactured from titanium alloy: Ti-6Al-4V ELI, ISO 5832-3,ASTM F136.

The PANTA® - PANTA® XL nails color code

Length / Diameter	L. 150 mm	L. 180 mm	L. 210 mm	L. 240 mm
Dia. 10 mm				
Dia. 11 mm				
Dia. 12 mm				
Dia. 13 mm				



Instrument description

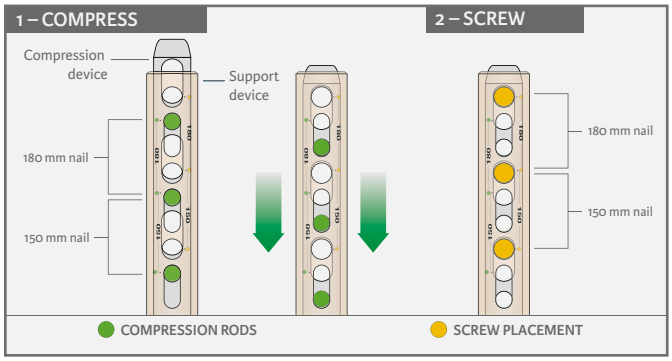
Instrument rationale

The instrumentation for the PANTA® and PANTA® XL nails is designed to achieve compression across the ankle and subtalar joints.

The compression/targeting device incorporates the following features:

- A combination of a radiolucent targeting frame to allow optimal placement of the calcaneal screws.
- A dual armed targeting device to allow medial or lateral tibial and talar screw placement and equal application of compression.
- A simple design conforming to natural hindfoot anatomy (calcaneus and ankle joint).
- A threaded compression mechanism to provide increased mechanical advantage and enhanced bony apposition.

Application of compression through the bone rather than through the soft tissue allowing more effective, direct and controllable alignment of the arthodesis sites.



Compression system

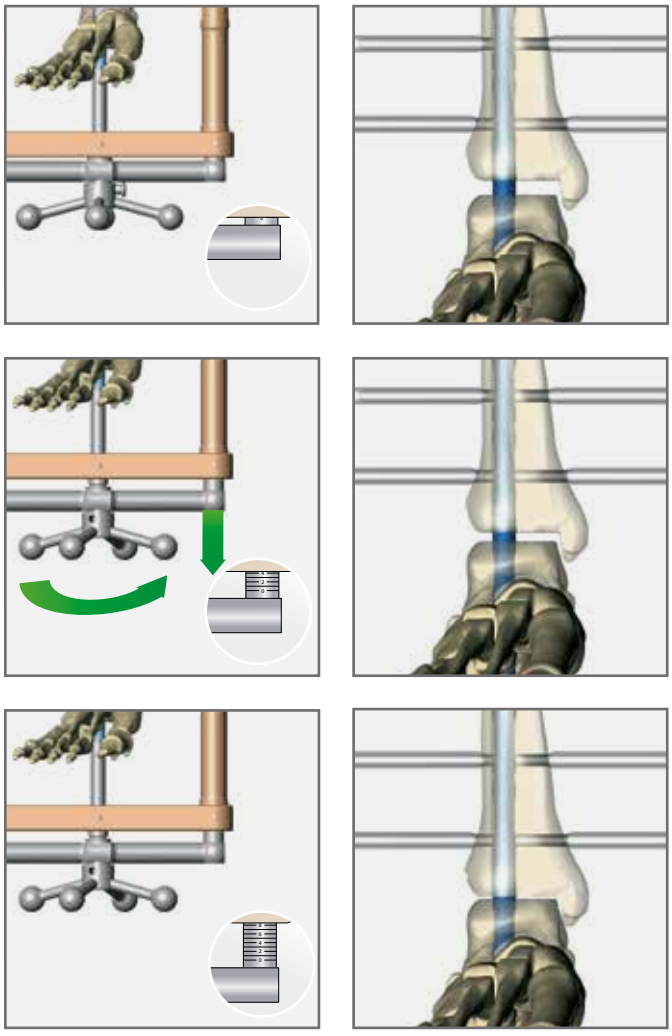
The compression/targeting device consists of a radiolucent frame and metallic support that are assembled together.

Compression rods are used to stabilize the device to the bone and offer the compression.

Applying compression

When the compression wheel is turned clockwise, the metallic support slides out, applying compression.

Up to 12 mm of compression can be applied. Direct and controllable alignment of the arthodesis sites.



Newdeal as the manufacturer of this device, does not practice medicine and does not recommend this or any other surgical technique for use on a specific patient. The surgeon who performs any implant procedure is responsible for determining and using the appropriate techniques for implanting the device in each patient.

Surgical technique

Preparation and incision

1 Patient positioning

The patient is placed supine with the foot close to the end of the table to facilitate the procedure.

2 Preparation of the joint surfaces

A range of surgical approaches and incisions can be utilized including anterior, anterolateral or lateral approaches to the tibiotalar joint and subtalar joint.

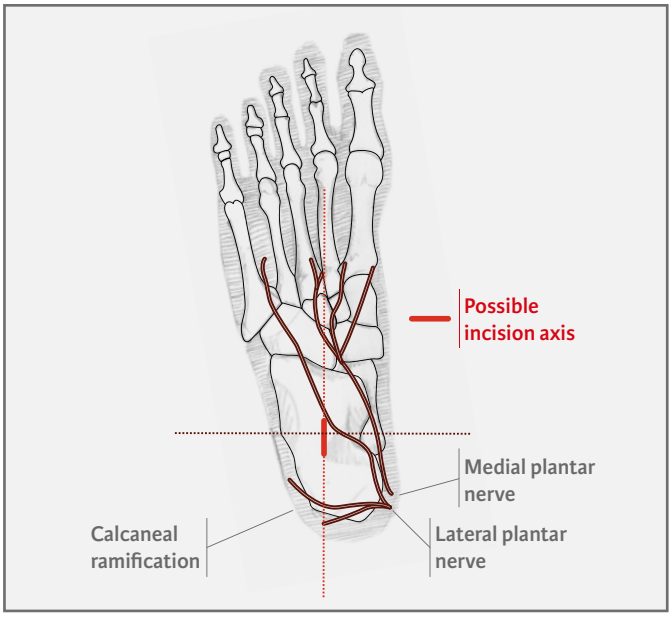
Single or separate incisions can be utilized depending upon the particular characteristics of the case.

The essential issue is to achieve satisfactory preparation of the bone surfaces for arthrodesis and satisfactory alignment of the limb through the arthrodesis sites.

3 Incision

A plantar incision is made to prepare for insertion of the nail and support device assembly. This may be a longitudinal or transverse incision.

Care must be taken to protect the plantar neurovascular structures, both in the dissection and during the procedure, as these structures are at risk.



519 028
Internal
protection sleeve
Dia. 3.2 mm

519029
Central
protection sleeve
dia. 9 mm

519 030
External
protection sleeve
dia. 13.5 mm

519 034 S
Sterile guide wire
Dia. 3.2 mm
Length 600 mm

519 034
Guide wire
Dia. 3.2 mm
Length 600 mm

519 032
Guide wire dia.
3.2 mm
Length 400 mm

PANTA® Arthrodesis nail insertion

Step 1 • First Drilling

Caution
Take extra-precaution when drilling in sclerotic bone. If necessary, take an Anterior - Posterior X-ray to ensure that the drill is through the calcaneal hole in the nail.

1-1 Assemble the plantar protection sleeves:
- **A** – internal 3.2 mm (519 028)
- **B** – central 9 mm (519 029)
- **C** – external 13.5 mm (519 030)

1-2 The guide wire insertion point should be slightly lateral to accommodate the lateral offset of the calcaneus relative to the medullary canal of the tibia.

1-3 **Appropriate tibial alignment is critical.**

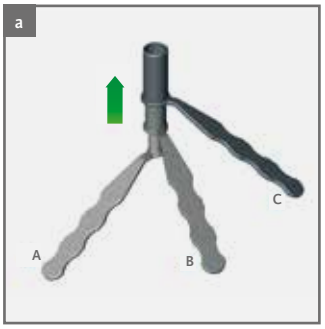
1-4 Introduce the 3.2mm diameter guide wire through the protection sleeves.
Use the 400mm (519 032) or the 600mm (519 034 or 519 034S) guide wire depending on surgeon preference.

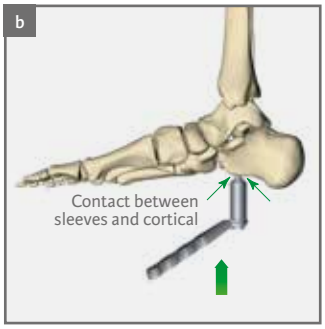
1-5 Note: Ensure canula is flush on inferior surface of calcaneus.
Advance through the calcaneus and the talus using fluoroscopy to control the position in both the anteroposterior and mediolateral planes.

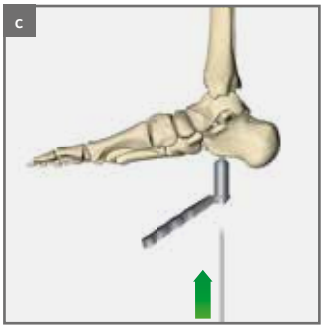
1-6 Confirm the alignment of the calcaneus and talus and the anatomic axis of the tibia.

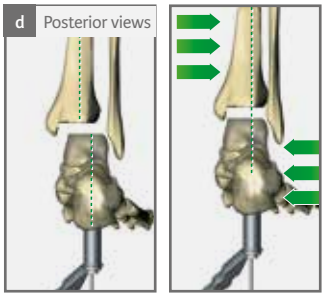
1-7 Advance the guide wire into the tibia.

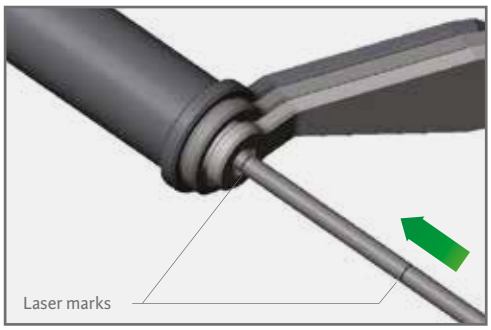
1-8 Laser marks on the guide wire may assist in the approximate length of the final implant.
The final length determination is made based on the final reamer depth described in the next step.









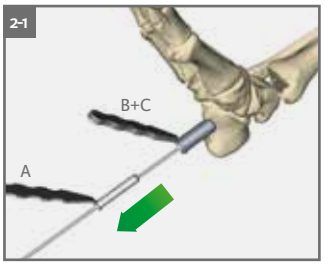


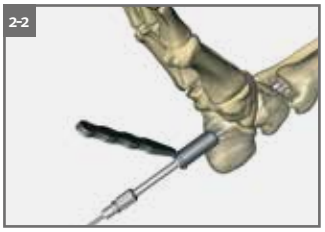
Step 2 • Canal enlargement

Caution
While reaming, position of foot may be lost due to plantar flexion at ankle. Consider provisional fixations to avoid plantar flexion of the foot on the ankle.

2-1 Change to the central protection sleeve B (519029), by removing the internal sleeve A (519028).

2-2 The 9 mm central protection sleeve has a built in stop for the 7mm and 9mm drills.The nail insertion point is enlarged by inserting the 7mm drill (519 007) until it contacts the back (plantar) side of the sleeve.
Insert the 9mm drill (519 009) to further enlarge the opening.





519 020
Quick coupling
(optional)

519 007
Cannulated drill
dia. 7 mm

519 009
Cannulated drill
dia. 9 mm

519 010
Reamer dia. 10 mm
(optional)

519 011 to 017
Reamers
dia. 10.5 to 13.5 mm

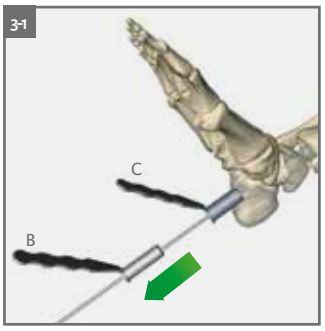
539 020 to 023
Conical reamers
dia. 10.5 to 13.5 mm

Step 3 • Reaming and nail choice

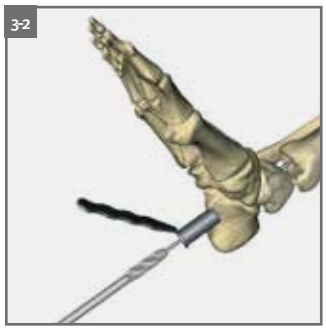
3-1 Remove the central protection sleeve B (519029). Attach the reamers to power using the cannulated quick coupling (519 020 : optional).

3-2 For nail diameter 11 to 13mm, start reaming with the 10.5mm diameter reamer (519 014) on all the chosen length (150 or 180mm) then use progressively all the reamers from diameter 11mm to the diameter that perfectly fits the tibial diaphysis. In case of very fragile bone, start reaming with the 10 mm diameter reamer (519010 : optional). The final diameter of the reamer should be 0.5mm larger than the final implant (see table bellow).

3-1



3-2



Specific for Panta® XL nail

After each reaming with classical reamers (519 011 to 519 017) sequentially ream with the conical reamers 539 020, 539 021, 539 022, 539 023. e.g.: for a Panta® XL 11mm dia. nail insertion, ream with the standard 11mm diameter reamer, then with 11.5mm diameter reamer.
Finish the reaming with the 11.5mm diameter conical reamer (539 020).

The final length of the implant is determined at this stage.

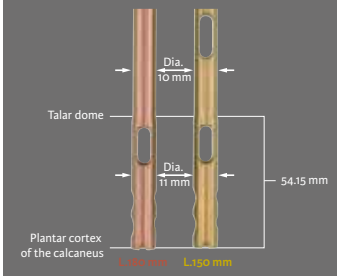
Check insertion with biplanar fluoroscopy and control the insertion depth using the position of the appropriate laser mark (150mm, 180mm, 210mm or 240mm) relative to the back surface of the outer sleeve.

Then proceed sequentially to the selected diameter of the nail.

Check the reamer under fluoroscopy in the anteroposterior and mediolateral planes to verify satisfactory position within the medullary canal.

Specific for 10 mm dia. Panta® nail

For the distal part of the 10mm diameter Panta® nail, start reaming with the 10.5mm diameter reamer (519014) then continue reaming only with the 11 + 11.5mm diameter reamer (519 011) and do not go past the talus. (drilling length: 70mm). The new generation 11 & 11.5mm diameter reamers (519 011 & 519 015) have a «D10» marking (Fig. 6.2). Ream until this mark is at the level of the back surface of the outer sleeve (519 030).



3-3

(specific 10 mm dia. nail)

Refer to corresponding table for PANTA® and Panta® XL nail

Final Reamer diameter	Nail diameter – Nail length			
10.5 mm	10 mm • 150 mm (Proximal)	10 mm • 180 mm (Proximal)		
11.0 mm				
11.5 mm	10 mm • 150 mm (Length 70 mm)	10 mm • 180 mm (Length 70 mm)		
	11 mm • 150 mm	11 mm • 180 mm	11 mm • 210 mm	11 mm • 240 mm
12.0 mm	-		-	
12.5 mm	12 mm • 150 mm	12 mm • 180 mm	12 mm • 210 mm	12 mm • 240 mm
13.0 mm	-		-	
13.5 mm	13 mm • 150 mm	13 mm • 180 mm	13 mm • 210 mm	13 mm • 240 mm

Step 4 • Nail insertion

Based on surgeon's preference, step 4 can be performed one of two ways (4-1 or 4-2).

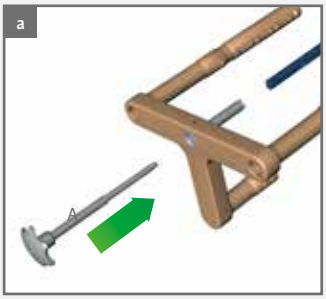
4-1 **Nail insertion with support device**
The guide wire has to be removed.

Open the final implant and remove the end cap.

Caution
Insert the nail fixation axis.
Engage the nail on the thread.
Position the nail on the three support teeth.
Finalize assembly.

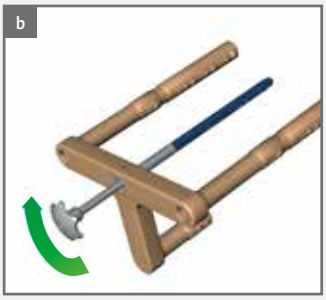
Caution
Do not discard the end cap. (If the end cap is accidentally discarded or dropped, sterile packaged replacement end caps are available)

a Assemble the toothed wheel (519 121) to the nail fixation axis (519 120).

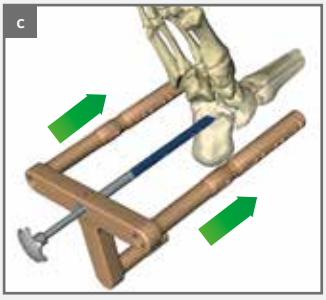


Caution
Special care should be taken when handling the nail fixation axis (A). It is not attached to the support device and may fell out of the sterile field if accidentally dropped.

b Introduce the assembly through the support device (519 110).
Position the implant on the nail fixation axis by aligning it with the three teeth on the support device.
This ensures the proper orientation of the screw holes.
Lock the implant to the support device by tightening the toothed wheel.



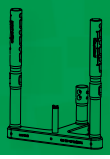
c Remove the guide wire.
Holding the alignment of the arthrodesis, manually insert the nail assembly under fluoroscopic control.



Caution
To avoid the nail to toggle on the targeting device assembly, it must be properly tightened with the nail fixation axis (519120).


519 121
Toothed wheel

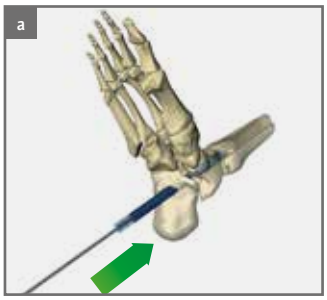

519 120
Nail fixation axis


519 110
Support device

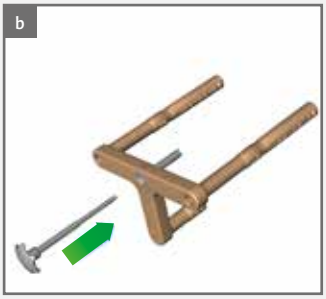
4-2 **Nail insertion and guide wire removal**
Open the final implant and remove the end cap.

a Insert the implant 2/3 of the way over the guide wire. Remove the guide wire.

Caution
Do not discard the end cap. (If the endcap is accidentally discarded or dropped, sterile packaged replacement end caps are available.)



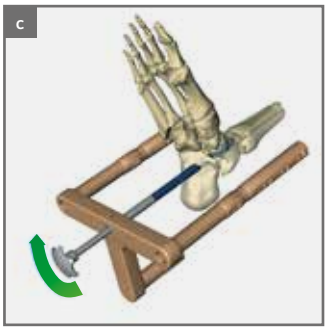
b Assemble the toothed wheel (519 121) to the nail fixation axis (519 120). Introduce the assembly through the support device (519 110).

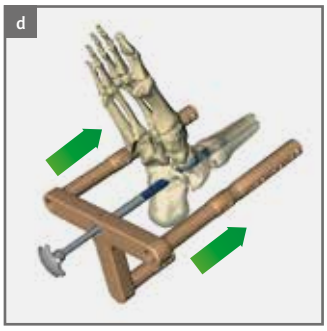


Caution
Special care should be exercised when handling the nail fixation axis (A). It is not attached to the support device and may fall out of the sterile field if dropped.

c Position the fixation axis by aligning it with the three teeth on the support device.
This ensures the proper orientation of the screw holes.
Attach support device to the implant by tightening the toothed wheel.

d Complete insertion of the assembly.





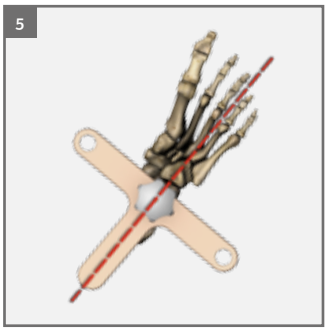
Step 5 • Nail positionning

5-1 The arthrodesis sites must be satisfactorily aligned under direct vision as well as radiographically.

5-2 The arthrodesis sites are manually compressed.

5-3 The final position of the nail/support device assembly is determined based on multiple factors:

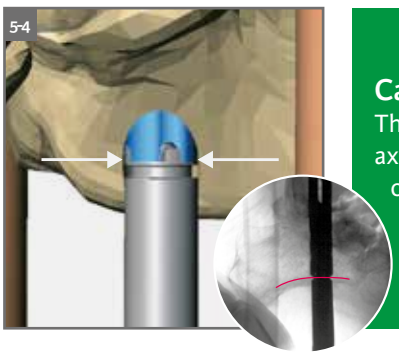
- The anatomy of the arthrodesis,
- Osseous structures,
- The position of the proximal interlocking screw holes relative to position of the fibula (for example, if the tibial screws are placed from lateral to medial, the rod is rotated slightly to move the screw holes anterior to the fibula).



Caution
The vertical axis of the support device should appear to be pointed approximately toward the center of the 3rd and 4th metatarsal.

5-4 After final positioning ensure that the distal end of the nail is flush with the plantar cortex of the calcaneus.
A visual verification of the height is made under fluoroscopy by ensuring that the groove is inside of the calcaneus.

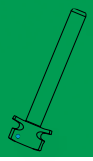
Caution
No pressure to be placed on jig during course of procedure. Applying a mallet to the bottom of the device to further insert the implant **MAY CAUSE LOOSENING at connection point, causing nail to fall into misaligned position.**



Caution
The groove between the axis and the distal end of the nail should be at or slightly above the plantar cortex.

519 040
Trocar awl

519 178 (optio-nal)
Medium drill guide
519 179
Short drill guide dia. 4.3 mm



519 183 (optional)
Medium soft tissu protector
519 184
soft tissu protector dia. 7mm

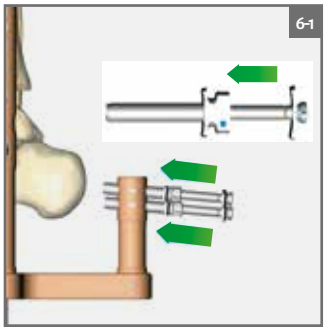
Step 6 • Calcaneus pre-drilling

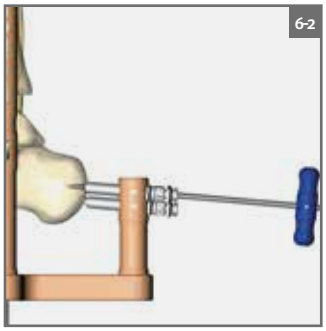
It is important to check that the nail fixation axis is properly tightened with the nail to avoid any misalignement with screws.

For easy identification, instruments concerning calcaneus contain blue dots. They also correspond to the appropriate insertion holes on the support device.

6-1 Assemble the 4.3mm short drill guide (519 179) with the 7 mm short soft tissue protector (519 184). Place the soft tissue protector on the skin to precisely determine the incision point. Make the incision.

6-2 Insert the trocar awl (519 040) through the protection sleeves and into the posterior cortex of the calcaneus to prepare the bone for drilling.





Caution
To obtain an optimal drilling, the 3 short/ Medium drill guides and soft tissue protector have to be used in association with the trocar awl.

Step 7 • Proximal and Distal Calcaneus (1/2)

It is important to check that the nail fixation axis is properly tightened with the nail to avoid any misalignement with screws.

7-1 **Proximal calcaneus drilling**

Using the 4.3mm short drill (519 003) drill the proximal hole.

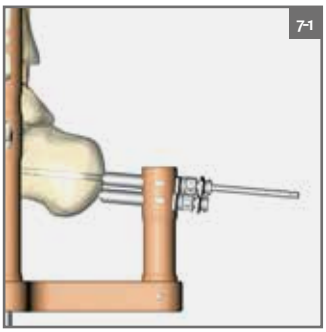
Control the drill depth using fluoroscopy.

The surgeon may read the screw length from the calibrated drill bit (read from top of the guide).

The drill guides must contact the cortex to provide the accurate screw depth.

Read step 8 for measurement method.

Leave drill in place.



Caution
If the drill guide is not in contact with the cortex, the depth gauge (519 160) must be used to determine the length of the calcaneal screws. See step 8 for more detail on the screw measurement technique.

Caution
If hard or sclerotic bone in calcaneal, peckdrill in calcaneal to adequetly insert drill through nail. Do not torque drill while drilling. This could cause skiving off nail.

Caution for steps 7 to 9

To ensure optimum axial stability and prevent the drill from skiving, the proximal drill has to be left in while drilling the distal hole and then inserting the distal screw.

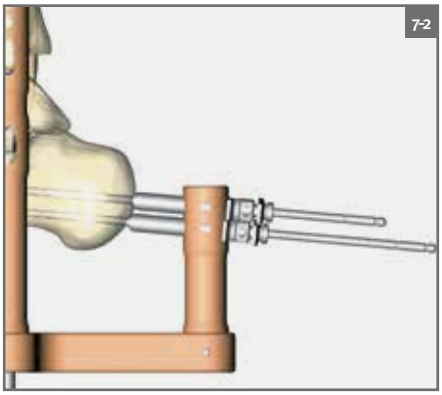
7-2 Distal calcaneus drilling

It is important to check that the nail fixation axis is properly tightened with the nail to avoid any misalignement with screws.

Drill the distal hole with the 4.3mm long drill (519 006).

Control the depth with fluoroscopy.

The surgeon may read depth directly on drill bit.



Step 8 • Measurement method

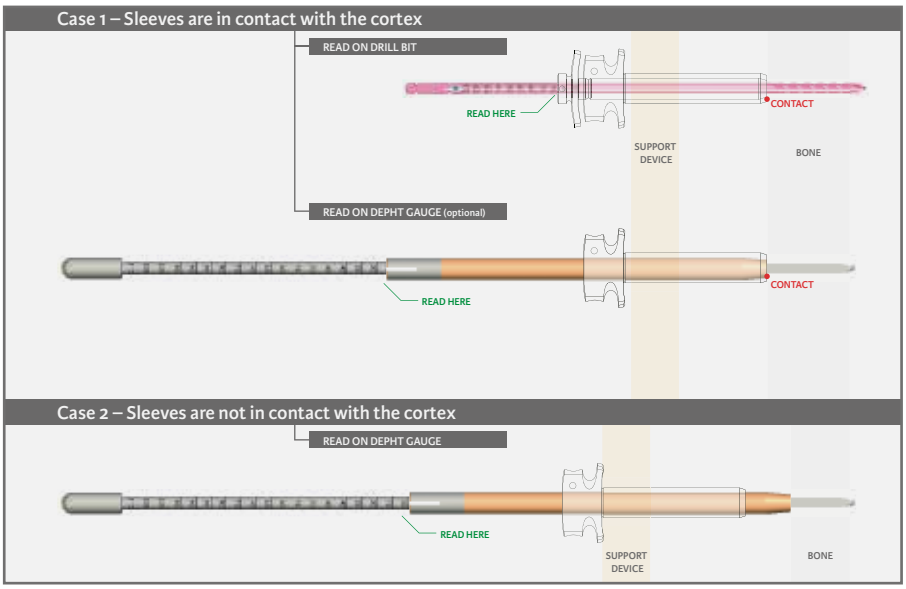
Two depth measurement methods may be used to determine the correct screw length. If the graduated drill bit is used the inner sleeve must be in contact with the bone.

Caution

The graduated drill bit indicates the length of screw to be used.
To get an accurate measurement from the drill, the inner sleeve must be in contact with the cortex. When the inner sleeves do not contact the cortex, the depth gauge should be used to verify the depth measurement.

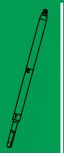
Caution

When the short drill guide (519 179) do not contact the cortex.
The medium soft tissu protector (519 183), the long drill guide (519 178) and the drills (519 002 & 519 008) are used instead of the regular ones.



539 015
Tap
dia. 6.5 mm

519 295
Hexagonal
screwdriver
dia. 3.5 mm



519 290
Hexagonal
screwdriver tip
dia. 3.5 mm

Step 9 • Calcaneus fixation

9-1 Remove the distal drill after reading the length of the screw on the bit.
Remove the drill guide, leaving the soft tissue protector in place.
Assemble the hexagonal screwdriver tip with AO attachment (519 290) to the power drill.

Note
Specific for PANTA® XL nail.
Only use the partially threaded screws.
(ref. 511 020 to 511 110).

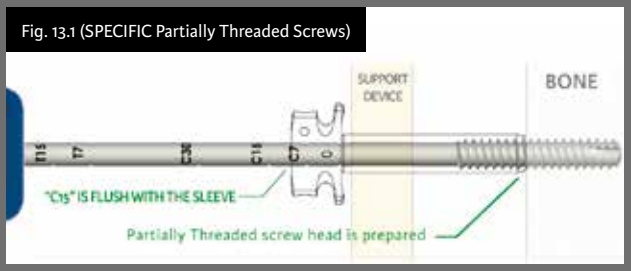
9-2 Screws are inserted by hand or partially by power and then completed by hand.
Screw insertion should be done using fluoroscopic control in perpendicular planes throughout the procedure.

9-3 Repeat these steps for the proximal screw.
Control the insertion depth using fluoroscopy.

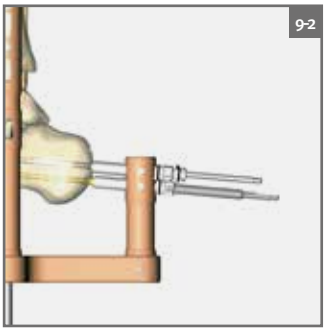
Specific partially threaded screws

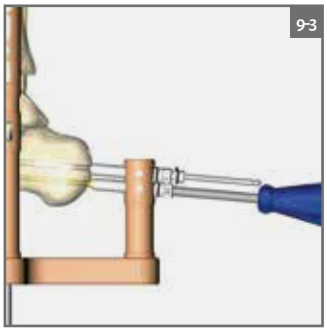
For partially threaded screws only, use the tap (539 015) to prepare the head of the partially threaded screw in the bone. Screw down slightly up to the right laser mark (C7,C15 or C30 / M7, M15 or M30 depending on the used sleeves), corresponding to the screw head length. Then unscrew slightly the tap.

Fig. 13.1 (SPECIFIC Partially Threaded Screws)



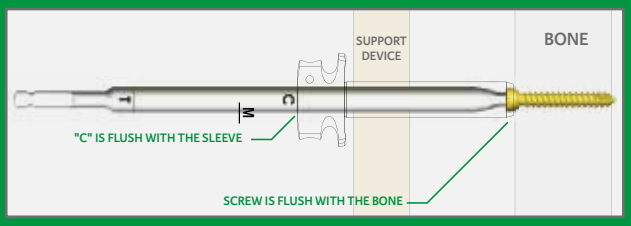
Scew ref.	Screw length	Head length	Corresponding laser mark
511 020 > 511 040	20 > 40 mm	7 mm	C7
511 045 > 511 060	45 > 60 mm	15 mm	C15
511 065 > 511 110	65 > 110 mm	30 mm	C30



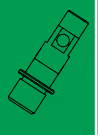


Caution

The “C” laser mark on the screwdriver or screwdriver (power) tip indicates the relative position of the screw head with respect to the posterior cortex of the calcaneus. When the “C” laser mark is flush with the rear face of the tissue protector, the screw head is nearly seated.

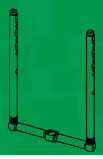


519 135
Compression wheel



519 131
Threaded axis

519 133 (x2)
Teflon ring



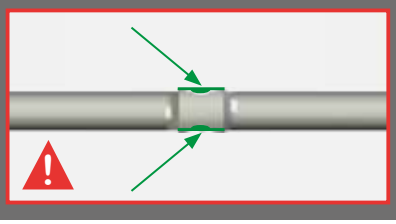
519 130
Compression device

Step 10 • Compression device

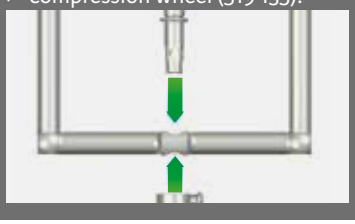
10-1 Remove the toothed wheel and put on the compression wheel (519 135) with the compression device (519 130). If one of the teflon rings (519 133) is missing, replace it with one of the extra rings in the instrument set.

Assembly

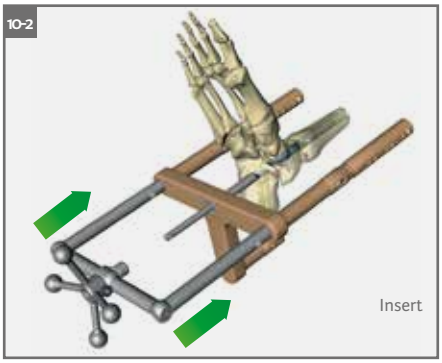
– Verify that both teflon rings are properly positioned on the compression device.



– Assemble the compression device with:
  › threaded axis (519 131).
  › compression wheel (519 135).



10-2 Insert the compression device into the support device (the laser markings and the mm scale should face anteriorly; this will ensure that the scale can be read easily when the patient is in the supine position).



10-3 Zero out the compression wheel by turning it counterclockwise (so that the millimeter scale on the medial and lateral sides is no longer visible). Recheck nail position under fluoroscopy.

Caution
If Tibial Compression Rods are unable to pass easily through device, apply 0.5 mm-1 mm compression until clear insertion is adhered.

519 175 (x2)
Compression rod

519 005
Drill dia. 5 mm

519 021
T-handle AO attachment

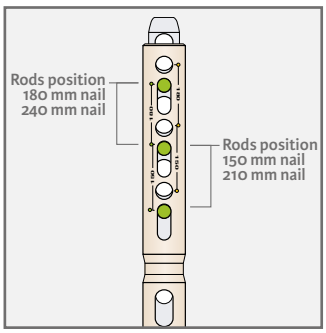
519 181 (x4)
Drill guide dia. 5 mm

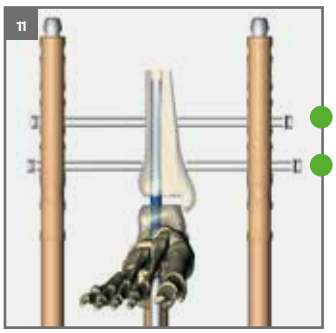
Step 11 • Rod incision

For easy identification, instruments concerning compression rods contain green dots. They also correspond to the appropriate insertion holes on the support device.

Position two drill guides (519 181) on each side of the green dotted holes. Holes will be selected based on the final length of the implant (150mm, 180mm, 210mm and 240mm).

Make the incisions.





Step 12 • Proximal and Distal drilling

12-1 Proximal drilling

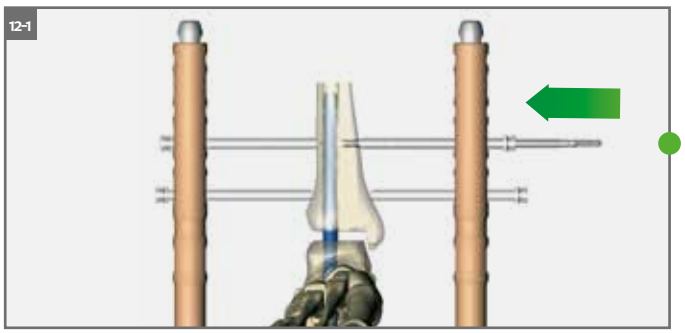
It is important to check that the nail fixation axis is properly tightened with the nail to avoid any misalignement with screws.

At this stage, the position of the foot with the tibia should be controlled and aligned at its final position.

Drill from the medial side if there is concern about hitting the fibula from the tibial side or drill through the fibula if a lateral approach is preferred.

Drill the proximal hole up to the second drill guide using the 5 mm diameter drill (519 005) indicated with a green dot.

Leave it in place.

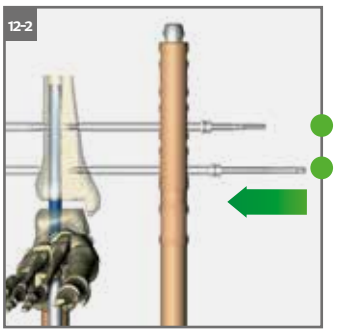


12-2 Distal drilling

It is important to check that the nail fixation axis is properly tightened with the nail to avoid any misalignement with screws.

Drill from the medial side if there is concern about hitting the fibula from the tibial side or drill through the fibula if a lateral approach is preferred.

Drill the distal hole with the second 5mm drill bit up to the coaxial drill guide.



Note
If distal drill bit misses nail, continue to proximal compression rod insertion under frequent fleuroscopic imagining.
After successful insertion, attempt distal compression rod through alateral approach.

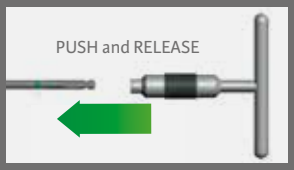
Step 13 • Distal and Proximal Rod insertion

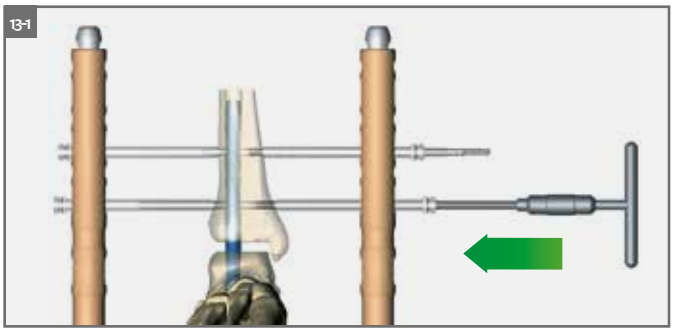
13-1 **Distal Rod insertion**

Remove the distal drill and introduce the compression rod using the T-handle. The 5 mm drill guides should be in contact with both sides of the tibial cortex. This facilitates the insertion of the compression rods across the tibia.

Assembly

Assemble the compression rod (519 175) to the AO T-Handle (519 021).

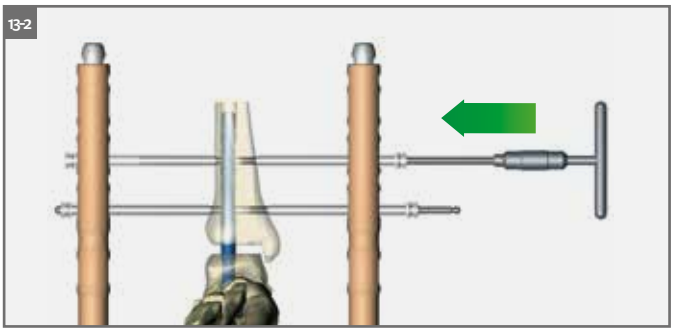


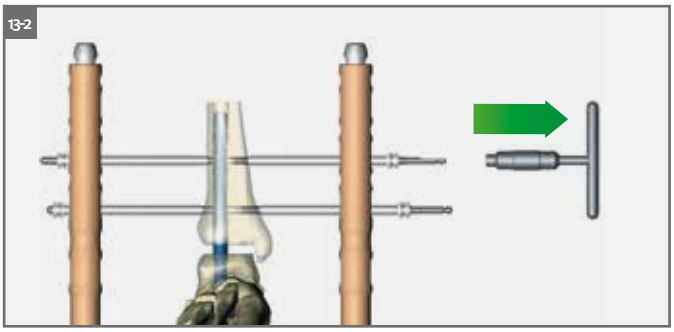


13-2 **Proximal Rod insertion**

Remove the proximal drill bit and insert the second compression rod using the T-handle.

Ensure that each rod is secured within both the medial and the lateral sleeves that pass through each arm of the compression device. Remove the T-handle attachment.





Caution

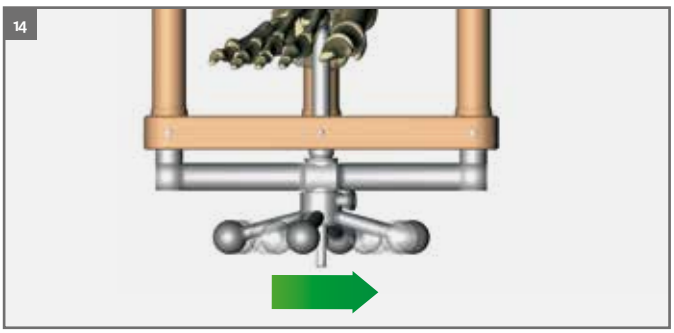
If compression rod does not pass easily into contralateral compression rod guide, probability is high the rod did not pass successfully through. Fluro should be used to confirm placement.

Step 14 • Compression

Gently apply compression by turning the compression wheel clockwise. Up to 12mm of compression may be applied.

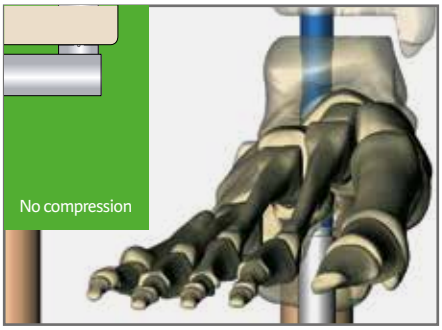
The compression can be visualized at any point using fluoroscopy.

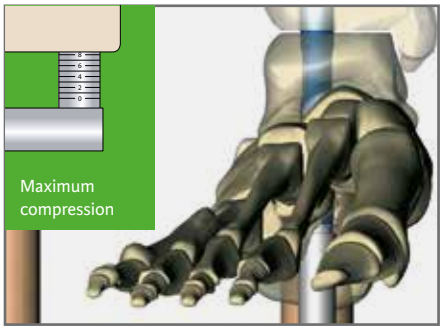
Stop when desired compression is reached.



Caution

Avoid over-compressing the arthrodesis sites! This may have adverse effects and impede removal of the compression rods. It could cause arms of jig to splay and cause tibial locking screws to miss nail.





519 185 (x2)
Long soft tissue protector
dia. 7 mm

519 180 (x2)
Long drill guide
dia. 4.3 mm

519 004
Drill for tibial screws
dia. 4.3 mm

519 160
Depth gauge

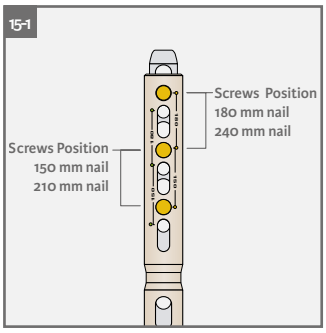
Step 15 • Tibial screws assembly

For easy identification, instruments concerning tibial and talus screws contain yellow dots. They also correspond to the appropriate insertion holes on the support device.

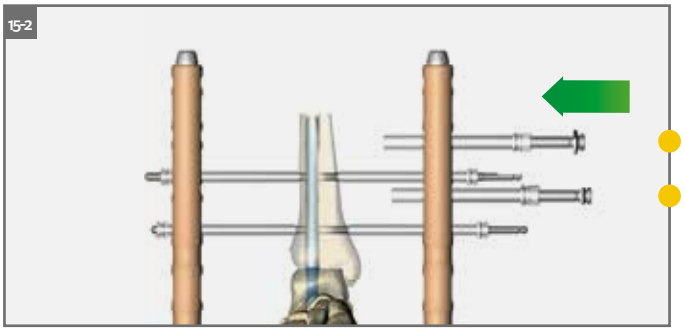
15-1 Assemble the long soft tissue protectors (519 185) (yellow dotted) with the long 4.3mm drill guides (519 180).
Position the protector/sleeve assembly in the compression device according to the length of the nail to determine incision height.
The screws can be placed from medial to lateral or lateral to medial in the tibia.The advantage of medial-to-lateral is that the insertion process passes through less soft tissue.
The advantage of lateral-to-medial screw placement is greater soft tissue protection over the screw head.
Make incision.

15-2 Insert the assembly into the yellow holes until the drill guide contacts the tibial cortex. The guide must contact the cortex to provide an accurate measurement of screw length when using the calibrated scale on the drill.
Fluoroscopy is used to control the proper contact of the drill guide and the bone.

15-1



15-2



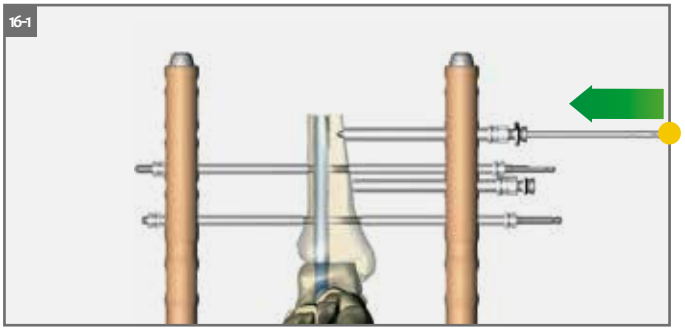
Step 16 • Proximal and Distal Tibia drilling

Drill from the medial side if there is concern about hitting the fibula from the tibial side or drill through the fibula if a lateral approach is preferred.

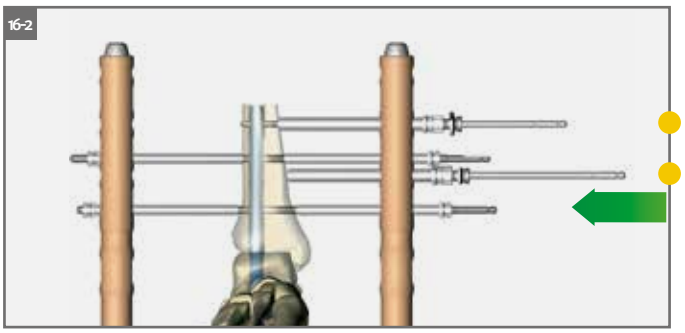
16-1 **Proximal drilling**
Use the proximal drill (519 004) for pre-drilling the proximal interlocking screws.
Leave the drill bit in the guide.

16-2 **Distal drilling**
Using the second 4.3 mm drill bit, drill the distal hole.

16-1



16-2

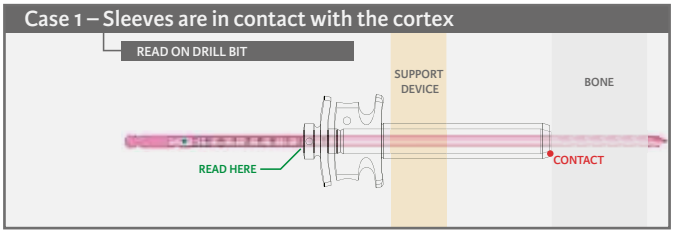


Step 17 • Tibial screws measurement

Read the screw length either from the calibrated drill bit (read from top of sleeve) or with the depth gauge (519 160).

See instructions for measurement Step 8.

Caution
The graduated drill bit indicates the length of screw to be used.



539 015
Tap dia. 6.5 mm

519 290
Hexagonal screwdriver tip dia. 3.5 mm

519 295
Hexagonal screwdriver dia. 3.5 mm

Step 18 • Distal and Proximal screws insertion

18-1 Distal screws insertion

Specific to partially threaded screws
For partially threaded screws only, use the tap (539 015) to prepare the head of the partially threaded screw in the bone. It should be screwed down slightly up to the right laser mark (T7 or T15), corresponding to the screw head length.Then unscrew slightly the tap.

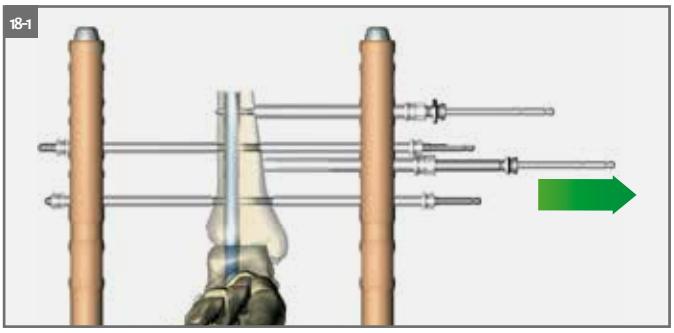
Scew ref.	Screw length	Head length	Lasermark
511 020 > 511 040	20 > 40 mm	7 mm	T7
511 045 > 511 060	45 > 60 mm	15 mm	T15

Assemble the hexagonal screwdriver tip (519 290) to the power drill.
The screws may be inserted by hand or by power.

Specific for Panta® XL nail
Only use the partially threaded screw (PTS) (ref. 511 020 to 511 110).

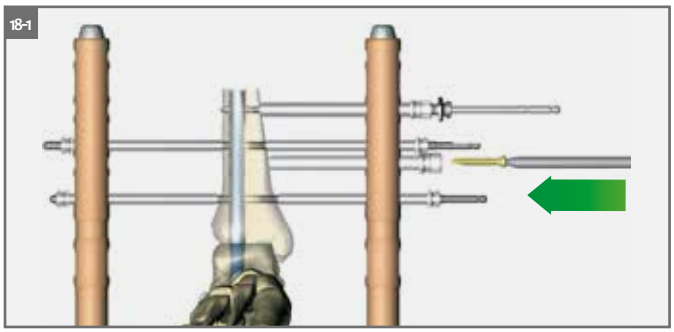
Check each step of the screw insertion as noted above using fluoroscopy in perpendicular AP and lateral planes.

18-1



Caution
The "T" laser mark on the shaft flush with the soft tissue protector indicates that the head of the screw is flush with the bone

18-1

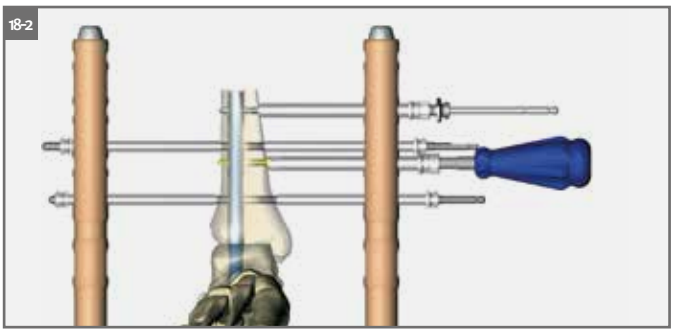


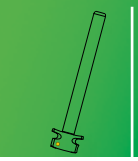
18-2 Proximal screws insertion

Remove proximal drill bit.

Proceed as described for the distal screw.
Finalize locking manually with the screwdriver.

18-2





519 185 (x2)
Long soft tissue protector
dia. 7 mm

519 180 (x2)
Long drill guide
dia. 4.3 mm

519 160
Depth gauge

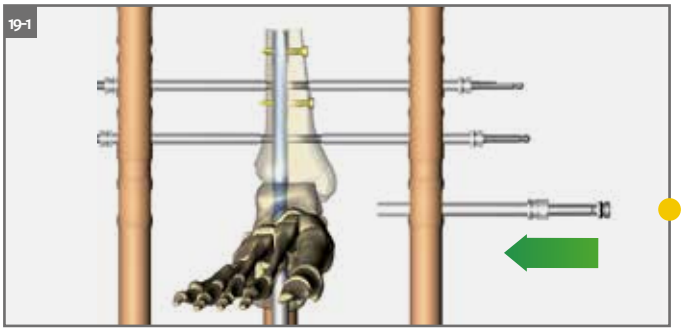
519 295
Hexagonal screwdriver
dia. 3.5 mm

519 004
Drill for tibial screws
dia. 4.3 mm

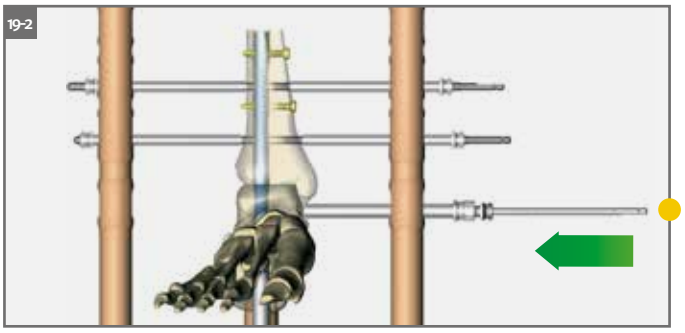
Step 19 • Talar screw (OPTIONAL)

An optional talar screw may be implanted after final fixation.

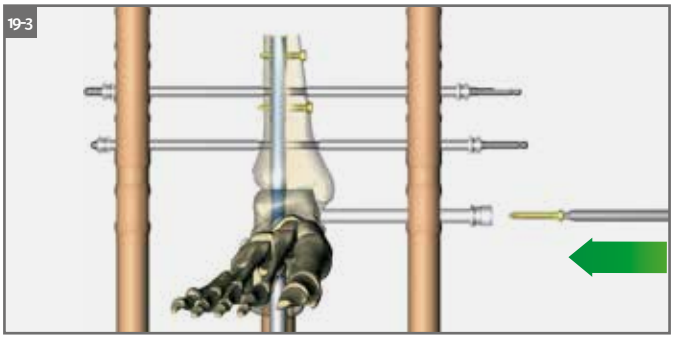
19-1 Assemble the long 4.3 mm drill guide (519 180) and the soft tissue protector (519 185), previously used for tibial screw preparation, and use the yellow color coded drill (519 004) to prepare the screw hole.



19-2 Control depth directly using the calibrated scale on the drill or with the depth gauge (519 160).
Read the screw length from the calibrated drill bit (read from top of sleeve).
See step 19 for measurement method.



19-3 Assemble the hexagonal screwdriver tip (519 290) to the power drill.
The screw may be inserted by hand or partially by power and then completed by hand.



Check each step of the screw insertion as noted above using fluoroscopy in perpendicular AP and lateral planes.

519 121
Toothed wheel

519 021
T-handle AO attachment

519 295
Hexagonal screwdriver dia. 3.5 mm

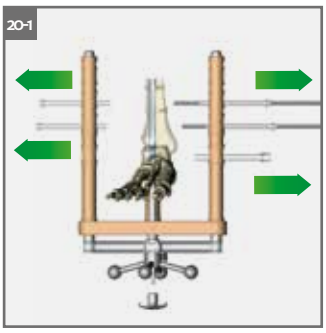
Step 20 • Support device removal

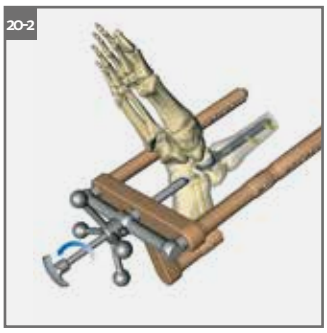
Release the compression device several turns counterclockwise on the wheel to ease the tension on the compression rods. Removing the sleeves will further release the tension and facilitate removal of the compression rods.

20-1 Using the T-handle (519 021), remove all the compression rods (519 175), then drill guides and soft tissue protectors .

20-2 Reattach the toothed wheel to the nail fixation axis and unscrew it to release the compression device from the implant.

20-3 Remove the compression device (519 130) and the nail fixation axis (519 120) toothed wheel (519 121). In the same time, hold the support device ref (519 110) in place.



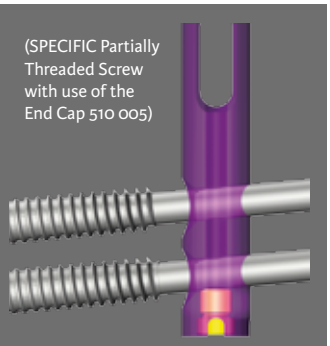


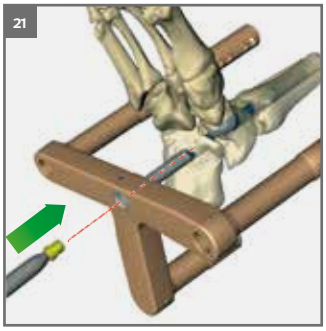
Step 21 • Guided end cap insertion

With the screwdriver (519 295) insert the end cap (500 001) in distal part of the Panta® nail through the support device ref (519 110).

Specific to partially threaded screws

For Panta® and Panta® XL nails with partially threaded screws, use the end cap (510 005) with the screwdriver (519 295). The distal screw is locked by the end cap.
The 510 004 can be inserted manually (out of the support device).





Caution

Care should be taken to prevent the end cap from falling into the soft tissues.

Tip

Use the middle reaming sleeve, insert through plantar wound, ensure tip of sleeve rests against plantar bone and distal end of nail. Confirm position of canula and nail under fluoro. Insert end cap through canula and tighten until locked.

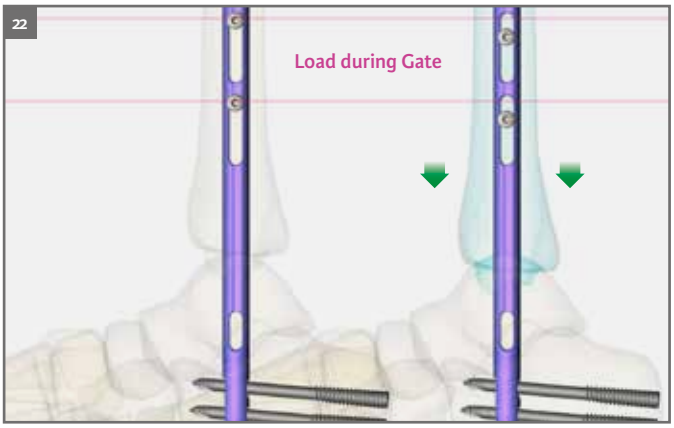
Step 22 • Post operative recommandations

2 months of immobilization in a cast or stable walker-boot to get the fusion between the bones healed.

Partial weight bearing and after 6 weeks full weight bearing.

When a bone graft was used to fill bony defects a much longer healing time can be expected (up to 9 months).

Then weight bearing up to surgeons discretion.



References

Panta® Nails (sterile)

Reference	Dia. - lenght
500 050	Dia. 10 mm - L. 150 mm
500 080	Dia. 10 mm - L. 180 mm
500 150	Dia. 11 mm - L. 150 mm
500 180	Dia. 11 mm - L. 180 mm
500 250	Dia. 12 mm - L. 150 mm
500 280	Dia. 12 mm - L. 180 mm
500 350	Dia. 13 mm - L. 150 mm
500 380	Dia. 13 mm - L. 180 mm

Panta® XL Nails (sterile)

Reference	Dia. - lenght
510 111	Dia. 11mm - L 210mm
510 141	Dia. 11mm - L 240mm
510 211	Dia. 12mm - L 210mm
510 241	Dia. 12mm - L 240mm
510 311	Dia. 13mm - L 210mm
510 341	Dia. 13mm - L 240mm

End cap (sterile)

Reference	Designation
500 001	End cap
510 005	Locking end cap
510 004	Locking end cap

Container

Reference	Designation
519 900	Container
including	
519 910	Basis
519 911	Insert
519 920	Lid

Associated instruments (1/2)

Reference	Designation
519 002	(optional) Short drill for calcaneus screws used with medium drill guide dia. 4.3 mm
519 003	Short drill dia. 4.3 mm for calcaneus screws
519 004	Drill dia. 4.3 mm for tibial screws
519 005	Drill dia. 5 mm
519 007	Cannulated drill dia. 7 mm
519 008	(optional) Long drill for calcaneus screws used with medium drill guide dia. 4.3 mm
519 009	Cannulated drill dia. 9 mm
519 010	Reamer dia. 10 mm (upon request)
519 011	Reamer dia. 11 mm
519 012	Reamer dia. 12 mm
519 013	Reamer dia. 13 mm
519 014	Reamer dia. 10.5 mm
519 015	Reamer dia. 11.5 mm
519 016	Reamer dia. 12.5 mm
519 017	Reamer dia. 13.5 mm
519 020	Optional quick coupling
519 021	T-handle with AO attachment
519 028	Internal protection sleeve dia. 3.2 mm
519 029	Central protection sleeve dia. 9 mm
519 030	External protection sleeve dia. 13.5 mm
519 034(S)	Guide wire dia. 3.2 mm, L. 600 mm (sterile upon request)
519 032	Guide wire dia. 3.2 mm, L. 400 mm
519 040	Trocar awl
519 110	Support device
519 120	Nail fixation axis
519 121	Toothed wheel
519 130	Compression device
519 131	Threaded axis
519 133	Teflon ring
519 135	Compression wheel
519 160	Depth gauge
519 175	Compression rod

Associated instruments (2/2)

Reference	Designation
519 178	(optional) Medium drill guide dia. 4.3mm
519 179	Short drill guide dia. 4.3 mm
519 180	Long Drill guide dia. 4.3 mm
519 181	Drill guide dia. 5 mm
519 183	(optional) Medium soft tissue protector dia. 7mm
519 184	Short soft tissue protector dia. 7 mm
519 185	Long soft tissue protector dia. 7mm
519 290	Hexagonal screwdriver tip dia. 3.5 mm
519 295	Hexagonal screwdriver dia. 3.5 mm
519 912	Conical Reamer Holder
539 015	Tap dia. 6.5 mm
539 020	Conical reamer dia. 10.5mm
539 021	Conical reamer dia. 11.5mm
539 022	Conical reamer dia. 12.5mm
539 023	Conical reamer dia. 13.5mm

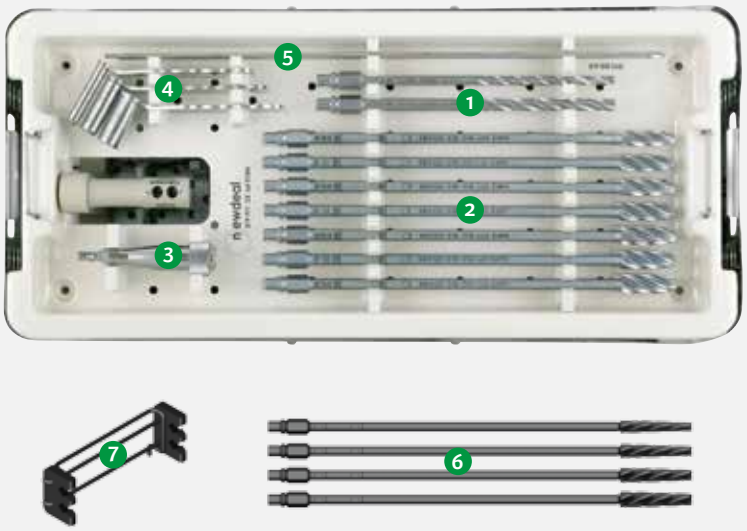
Partially threaded screw (PTS) dia. 5 mm (sterile)

Reference	Length
511 020	L. 20 mm
511 022	L. 22.5 mm
511 025	L. 25 mm
511 027	L. 27.5 mm
511 030	L. 30 mm
511 035	L. 35 mm
511 040	L. 40 mm
511 045	L. 45 mm
511 050	L. 50 mm
511 055	L. 55 mm
511 060	L. 60 mm
511 065	L. 65 mm
511 070	L. 70 mm
511 075	L. 75 mm
511 080	L. 80 mm
511 085	L. 85 mm
511 090	L. 90 mm
511 095	L. 95 mm
511 100	L. 100 mm
511 105	L. 105 mm
511 110	L. 110 mm

Fully threaded screw (FTS) dia. 5 mm (sterile)

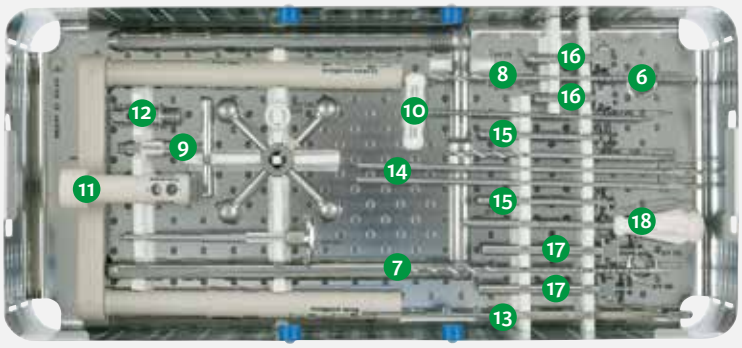
Reference	Length
501 020	L. 20 mm
501 022	L. 22.5 mm
501 025	L. 25 mm
501 027	L. 27.5 mm
501 030	L. 30 mm
501 035	L. 35 mm
501 040	L. 40 mm
501 045	L. 45 mm
501 050	L. 50 mm
501 055	L. 55 mm
501 060	L. 60 mm
501 065	L. 65 mm
501 070	L. 70 mm
501 075	L. 75 mm
501 080	L. 80 mm
501 085	L. 85 mm
501 090	L. 90 mm
501 095	L. 95 mm
501 100	L. 100 mm
501 105	L. 105 mm
501 110	L. 110 mm

Instrumentation set



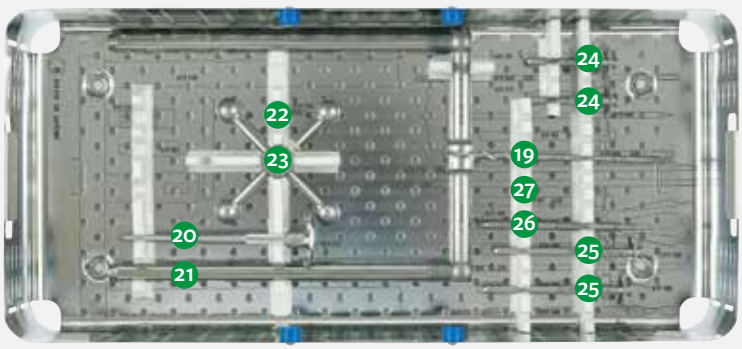
Insert

#	Reference	Description
1	519 007	Cannulated drill dia. 7mm
1	519 009	Cannulated drill dia. 9mm
2	519 010 to 519 017	Reamers dia. 10mm to dia. 13.5mm (x7)
3	519 020	Quick Coupling (optional)
4	519 028	Internal protection sleeve dia. 3.2 mm
4	519 029	Central protection sleeve dia. 9mm
4	519 030	External protection sleeve dia. 13.5mm
5	519 032	Guide wire dia. 3.2 mm, L. 400 mm
6	539 020 to 539 023	Conical Reamers dia. 10.5mm to dia. 13.5mm (x4) for Panta® XL nail
7	519 912	Conical Reamer holder X2 (to be hang on the basis 519 910) for Panta® XL nail
8	519 034 & 519 034S	Guide wire dia. 3.2, L.600mm



Basis - Upper level

#	Reference	Description
6	519 003	Short drills dia. 4.3mm for calcaneus screws
7	519 004	Drill dia. 4.3mm for tibial screws (x2)
8	519 006	Long drill dia. 4.3mm for calcaneus screws
9	519 021	T-handle with AO attachment
10	519 040	Trocar awl
11	519 110	Support device
12	519 131	Threaded axis
13	519 160	Depth gauge
14	519 175	Compression rods (x4)
15	519 181	Drill guide dia. 5mm (x4)
16	519 184	Short soft tissue protector dia. 7mm (x2)
17	519 185	Long soft tissue protector dia. 7mm (x2)
18	519 295	Hexagonal screwdriver dia. 3.5mm



Basis - Lower level

#	Reference	Description
19	519 005	Drill dia. 5mm (x2)
20	519 120	Nail fixation axis
20	519 121	Toothed wheel
21	519 130	Compression device
22	519 133	Teflon rings (x2)
23	519 135	Compression wheel
24	519 179	Short drill guide dia. 4.3mm (x2)
25	519 180	Long drill guide dia. 4.3mm (x2)
26	519 290	Hexagonal screwdriver tip dia. 3.5mm
27	539 015	Tap dia. 6.5mm

Integra®

Panta® – Panta® XL

Arthrodesis Nail System

SURGICAL TECHNIQUE
REMOVAL KIT

INTEGRA®
LIMIT UNCERTAINTY

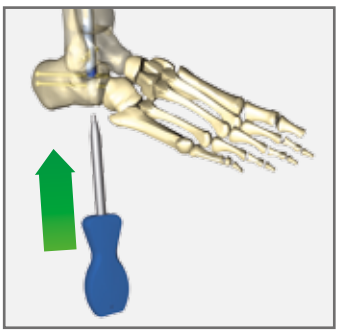
NEWDEAL as the manufacturer of this device, does not practice medicine and does not recommend this or any other surgical technique for use on a specific patient. The surgeon who performs any implant procedure is responsible for determining and using the appropriate techniques for implanting the device in each patient.

Surgical technique

Step 1 • End Cap unscrewing

Remove the end cap using the screwdriver (309 645). The protection sleeve (119 552) may be used to find the nail extremity.

A fluoroscopy control can be useful during this step.

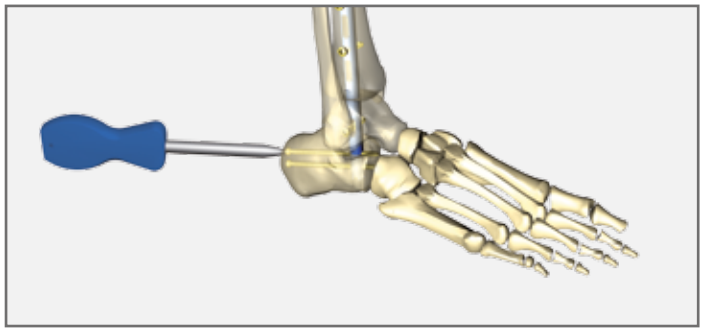


End cap unscrewing

Step 2 • Calcaneal screws removal

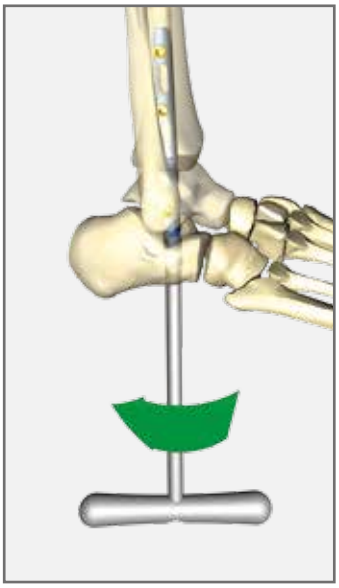
Calcaneal screws (501 020 to 501 110 or 511 020 to 511 110) have to be removed first. Protection sleeves (119 552) may be used to locate the screw head. Using the screwdriver (309 645) remove both screws.

In case of talar screw presence, remove it.

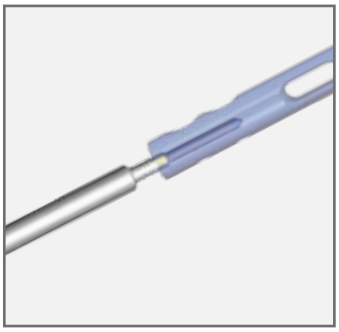


Insert the « T » handle (519 210) into the nail. The sharp extremity enables to find out the cannula.

Protection sleeve may be used.



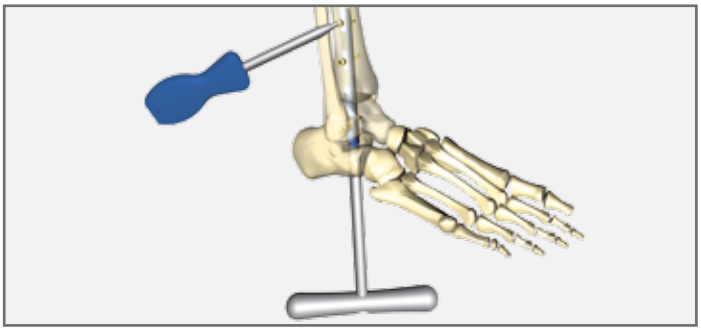
T handle screwing



Thread enabling optimal anchorage

Step 3 • Tibial screws removal

As for the calcaneal screws, the tibial screws (501 020 to 501 110 or 511 020 to 511 110) have to be removed using the screwdriver.



Tibial screw unscrewing

309 645
Screwdriver Hex
Diam 3.5mm

119 552
Protection sleeve

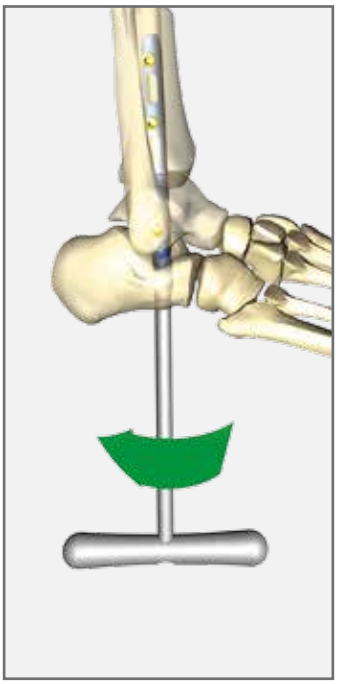
519 210
Handle extractor

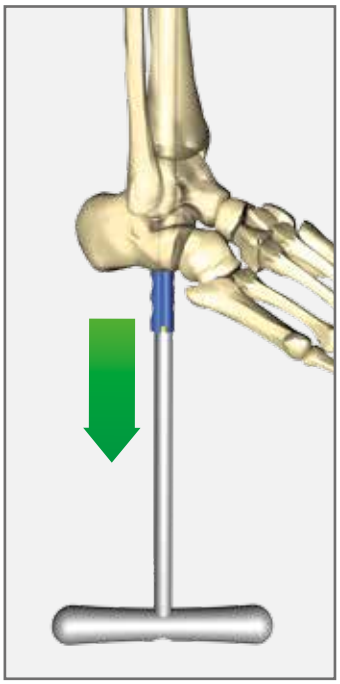
519 209
Sliding hammer

Step 4 • Nail removal with the «T» handle

Break possible bony bridge by turning the «T» handle.

Then pull the «T» handle to remove the nail.



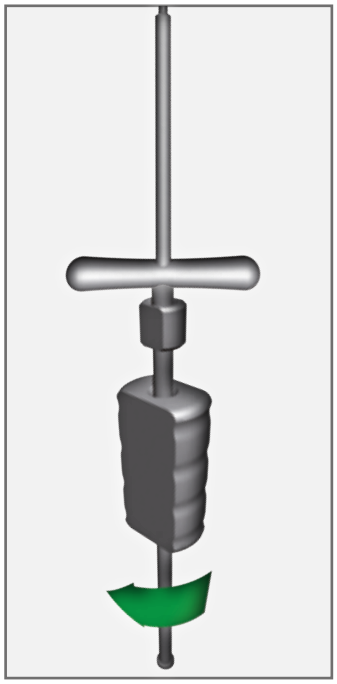


Nail extraction

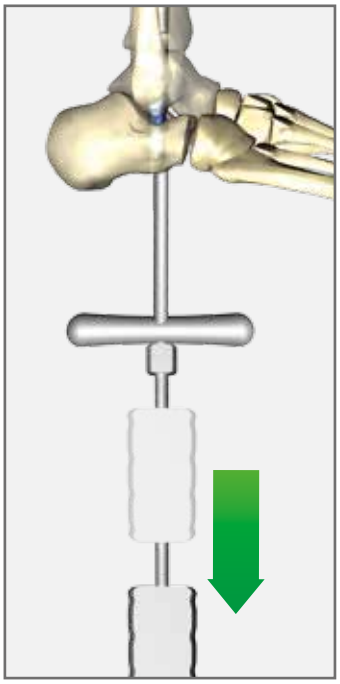
Nail extraction with the sliding hammer

In case of hard bone, the sliding hammer might be used. Attach the sliding hammer to the «T» handle while holding the assembly.

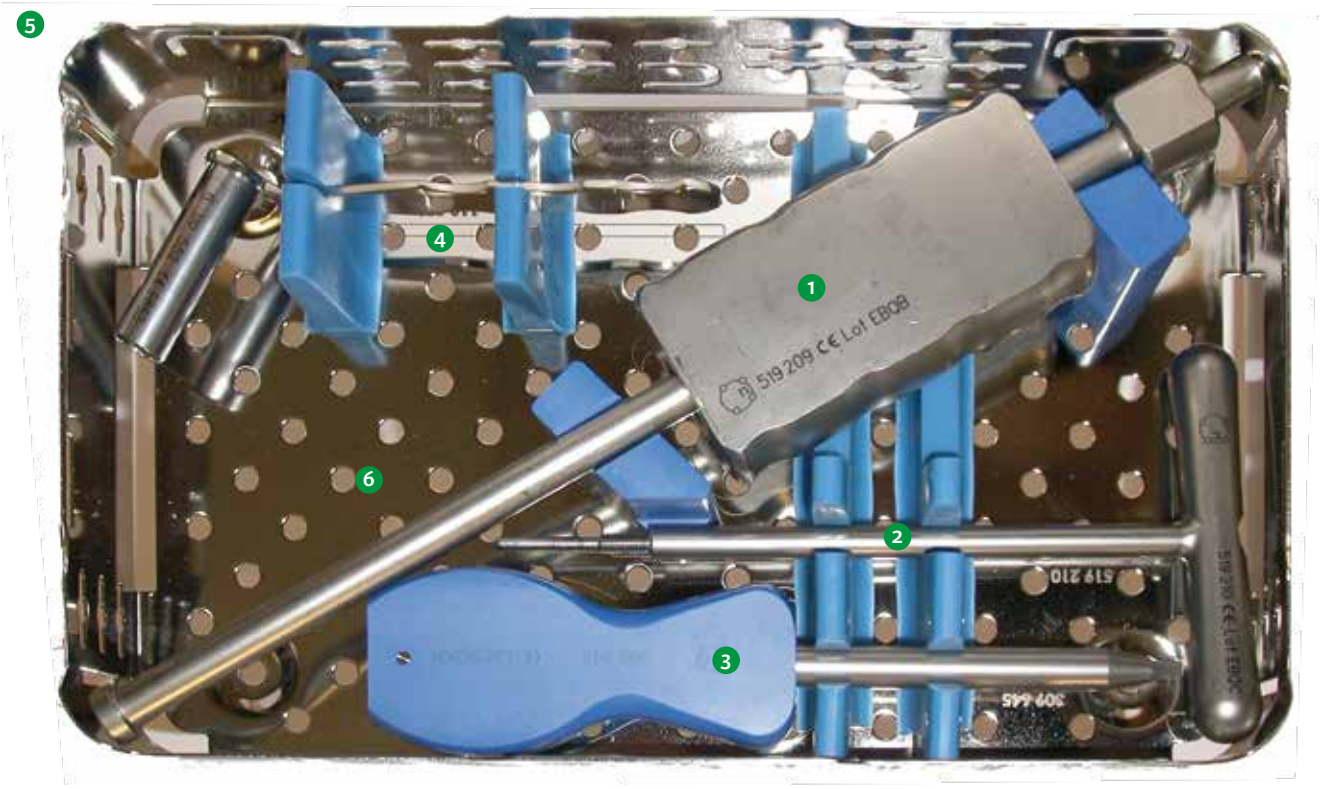
Slide the hammer in axial until the bony bridges are broken and the nail extracted.



« T » handle assembling on the sliding hammer



Assembling of the sliding hammer to the « T » handle for nail extraction



#	Ref	Panta® Nail removal kit description
1	519 209	Sliding hammer
2	519 210	Handle extractor
3	309 645	Screwdriver Hex Dia 3.5mm
4	119 552	Protection sleeve
5	519 950	**Container including the following components:**
6	519 951	Basis
7	996 100	Lid (not shown)

Bibliography – Not exhaustive list

Mendicino R, Catanzariti A, Saltrick K, Domberk M, Tullis B, Statler T, Johnson B
Tibiotalocalcaneal Arthrodesis with Retrograde Intramedullary Nailing
The Journal of Foot and Ankle Surgery • Volume 42, N° 2 • 2004

Mader K, Pennig D, Gausepohl T, Patsalis T
Calcaneotalotibial arthrodesis with a retrograde posterior-to-anterior locked nail as a salvage procedure for severe ankle pathology
The Journal of Bone and Joint Surgery • Volume 85-A: 123-128 • 2003

Quill G
Tibiotalocalcaneal Arthrodesis with Medullary Rod Fixation
Techniques in Foot and Ankle Surgery •
Volume 2, Issue 2:135-143 • 2003

Berson L, McGarvey W, Clanton T
Evaluation of Compression in Intramedullary hind foot Arthrodesis
Foot and Ankle International • Volume 23, n° 11:992-995 • 2002

Mann M, Parks B, Pak S, Miller S
Tibiotalocalcaneal Arthrodesis: A Biomechanical Analysis of the Rotational Stability of the Biomet Ankle Arthrodesis Nail
Foot and Ankle International • Volume 22, n° 9:731-733 • 2001

Chou L, Mann R, Yaszay B, Graves S, McPeake W, Dreeben S, Horton G, Katcherian D, Clanton T, Miller R, Van Manen J
Tibiotalocalcaneal arthrodesis
Foot and Ankle International • Volume 21, n° 10:804-808 • 2000

Thordarson D, Chang D
Stress fractures and tibial cortical hypertrophy after tibiotalocalcaneal arthrodesis with an intramedullary nail
Foot and Ankle International • Volume 20, n° 8:497-500 • 1999

Fujimori J, Yoshino S, Koiwa M, Nakamura H, Shiga H, Nagashima S
Ankle arthrodesis in rheumatoid arthritis using an intramedullary nail with fins
Foot and Ankle International • Volume 20, n° 8:485-489 • 1999

Berend M, Glisson R, Nunley J
A biomechanical comparison of intramedullary nail and crossed lag screw fixation for tibiotalocalcaneal arthrodesis
Foot and Ankle International • Volume 18, n° 11:639-643 • 1997

Pinzur M, Kelikian A
Charcot Ankle Fusion with a Retrograde Locked Intramedullary Nail
Foot and Ankle International • Volume 18, n° 11:699-704 • 1997

Integra LifeSciences Services (France) SAS
Sales & Marketing EMEA
Immeuble Séquoia 2 ▪ 97 allée Alexandre Borodine
Parc technologique de la Porte des Alpes
69800 Saint Priest ▪ FRANCE
Phone +33 (0)4 37 47 59 00 ▪ fax +33 (0)4 37 47 59 99
emea.info@integralife.com ▪ **integralife.eu**

Customer Services
International: +33 (0)4 37 47 59 50 ▪ +33 (0)4 37 47 59 25 (Fax) ▪ emea.ics@integralife.com
United Kingdom : csuk.ortho@integralife.com
France: +33 (0)4 37 47 59 10 ▪ +33 (0)4 37 47 59 29 (Fax) ▪ cs-ortho@integralife.com
Benelux: +32 (0)2 257 4130 ▪ +32 (0)2 253 2466 (Fax) ▪ custsvcbenelux@integralife.com
Switzerland: +41 (0)2 27 21 23 30 ▪ +41 (0)2 27 21 23 99 (Fax) ▪ custsvcsuisse@integralife.com

Newdeal SAS
Immeuble Séquoia 2 ▪ 97 allée Alexandre Borodine
Parc technologique de la Porte des Alpes ▪ 69800 Saint Priest ▪ FRANCE
Phone +33 (0)4 37 47 51 51 ▪ Fax +33 (0)4 37 47 51 52 ▪ newdeal.contact@integralife.com ▪ www.newdeal.info

Distributed by

INTEGRA®
LIMIT UNCERTAINTY

All the medical devices mentioned on this document are CE marked according to European council directive 93/42/EEC on medical devices and its relatives, unless specifically identified as "NOT CE MARKED". Availability of these products might vary from a given country or region to another, as a result of specific local regulatory approval or clearance requirements for sale in such country or region. ▪ Always refer to the appropriate instructions for use for complete clinical instructions. ▪ Non contractual document. The manufacturer reserves the right, without prior notice, to modify the products in order to improve their quality. ▪ WARNING: Applicable laws restrict these products to sale by or on the order of a physician. ▪ Panta, Integra and the Integra logo are registered trademarks of Integra Lifesciences Corporation or its subsidiaries in the United States and/or other countries. All other trademarks and product names are the property of their respective owners.

CE 0120