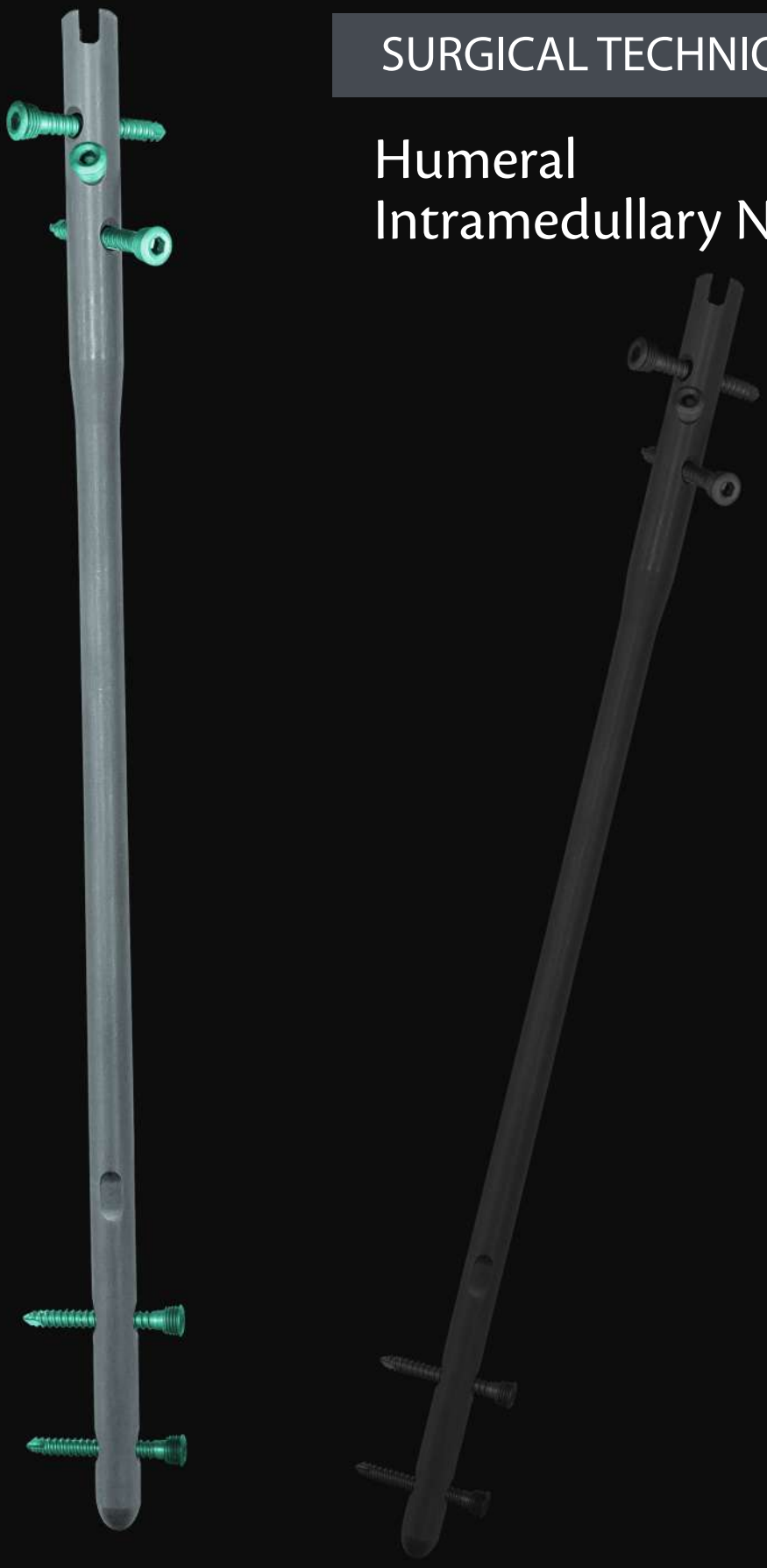
SURGICAL TECHNIQUE

Humeral Intramedullary Nail



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INTRODUCTION

This surgical technique describes the suggested use of the instruments and implants, not aiming to interfere with the decisions of the traumatologist, considering his/her vast clinical and surgical experience to determine the best treatment for each particular patient

IMPLANTS FEATURES

- Available in 7mm and 8mm diameter
- Made of Ti6Al4V ELI titanium alloy
- 3 proximal locking holes
- 2 distal locking holes
- 3.5 mm diameter from 20mm to 50mm in length Locking screw

SURGICAL INDICATIONS

Traufix Humeral intramedullary nails are indicated for diaphysiary fractures of the humerus.

GENERAL CONTRAINDICATIONS

• Systemic inflammatory response syndrome (to be evaluated by the surgeon).
• Septicemia.
• Osteomyelitis.
• Patient unable to comply with post-operation care.
• Hypersensitivity to the materials (titanium).

SPECIFICATIONS

Humeral Intramedullary Nail made of high quality titanium.

Humeral Intramedullary Nail 7 mm

CODE	
197.160	7 mm X 160 mm
197.180*	7 mm X 180 mm
197.200*	7 mm X 200 mm
197.220*	7 mm X 220 mm
197.240*	7 mm X 240 mm
197.260*	7 mm X 260 mm
197.280*	7 mm X 280 mm
197.300*	7 mm X 300 mm
197.320*	7 mm X 320 mm

* Contained in the standard implant set.

Humeral Intramedullary Nail 8 mm

CODE	
194.160	8 mm X 160 mm
194.180*	8 mm X 180 mm
194.200*	8 mm X 200 mm
194.220*	8 mm X 220 mm
194.240*	8 mm X 240 mm
194.260*	8 mm X 260 mm
194.280*	8 mm X 280 mm
194.300*	8 mm X 300 mm
194.320*	8 mm X 320 mm

* Contained in the standard implant set.

Humeral Intramedullary Nail 9 mm

CODE	
218.160	9 mm X 160 mm
218.180	9 mm X 180 mm
218.200	9 mm X 200 mm
218.220	9 mm X 220 mm
218.240	9 mm X 240 mm
218.260	9 mm X 260 mm
218.280	9 mm X 280 mm
218.300	9 mm X 300 mm
218.320	9 mm X 320 mm

Humeral Intramedullary Nail 10 mm

CODE	
219.160	10 mm X 160 mm
219.180	10 mm X 180 mm
219.200	10 mm X 200 mm
219.220	10 mm X 220 mm
219.240	10 mm X 240 mm
219.260	10 mm X 260 mm
219.280	10 mm X 280 mm
219.300	10 mm X 300 mm
219.320	10 mm X 320 mm

3.5mm Locking Screw for Intramedullary Nail

CODE	
195.20	3.5 mm X 20 mm
195.25	3.5 mm X 25 mm
195.30	3.5 mm X 30 mm
195.35	3.5 mm X 35 mm
195.40	3.5 mm X 40 mm
195.45	3.5 mm X 45 mm
195.50	3.5 mm X 50 mm
195.55	3.5 mm X 55 mm
195.60	3.5 mm X 60 mm
195.65	3.5 mm X 65 mm
195.70	3.5 mm X 70 mm
195.75	3.5 mm X 75 mm
195.80	3.5 mm X 80 mm

End Cap for humeral Nail

CODE

196.08

DESCRIPTION OF THE SURGICAL TECHNIQUE

Patient Positioning

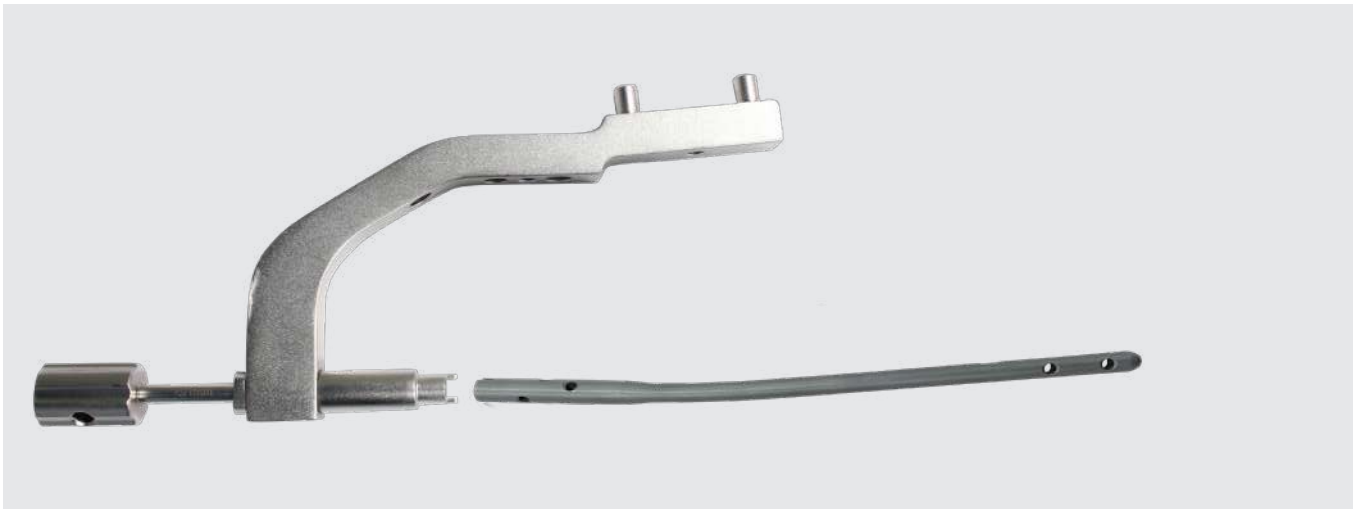
Place the patient in the beach chair position.

Approach:

The head of the humerus is exposed through an anterolateral incision. The entrance is up to 1 cm from the clavicular acromium dissecting up to the rotator cuff. Caution is necessary in order to minimize injuries and repair tendon.

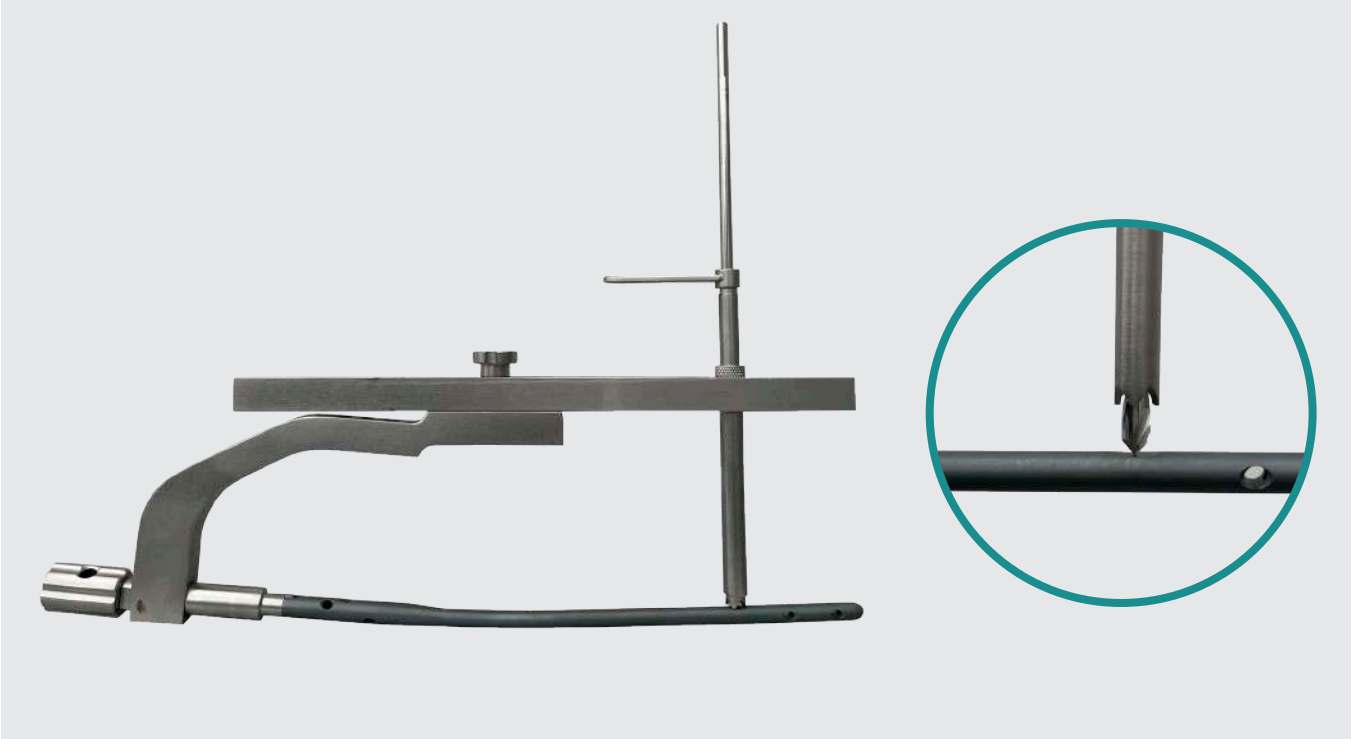
Preparation of the equipment

1. The nail is placed on the insertion handle and adjusted with the nail fastener.

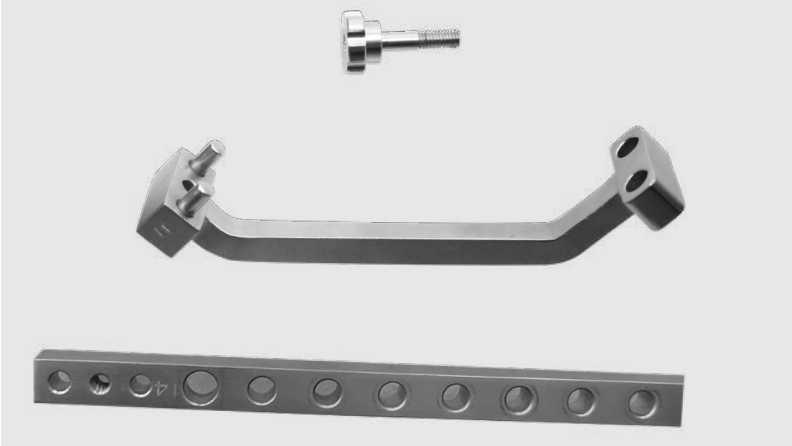


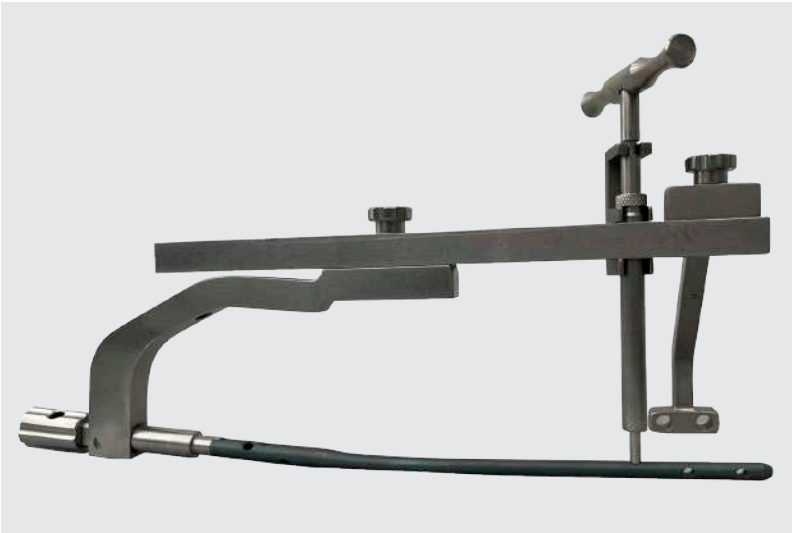
2. The locking strip is placed over the insertion handle and fastened with one of the screws and taking care of the arrow corresponding to the length of the nail matches the arrow of the insertion handle.

3. Place the inner and outer sleeve for the 5.2mm drill bit in the graduated rail. The drill bit must coincide with the distal locking plane.



4. The distal targeting device is assembled with the locking strip. Secure the distal targeting device with the screw and 5mm Allen wrench. Place a sleeve for Ø5.2mm drill bit, then place the position rod and secure it with the stabilizing device.



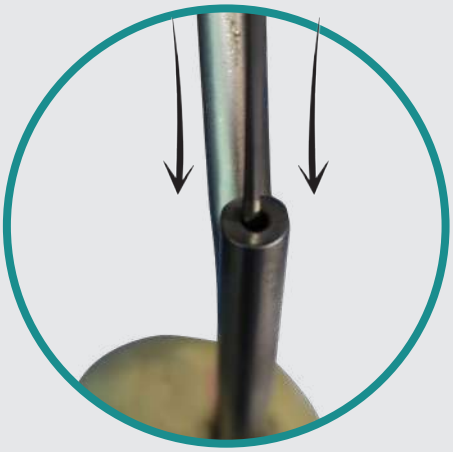


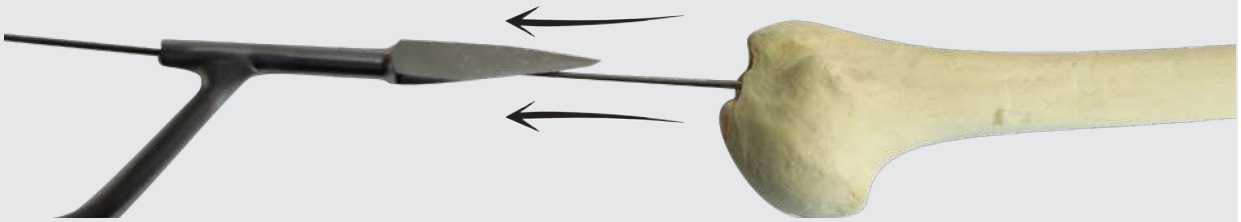
Implant Placement:

1. Perform fracture reduction and verify the placement site of the initial pin under fluoroscopy

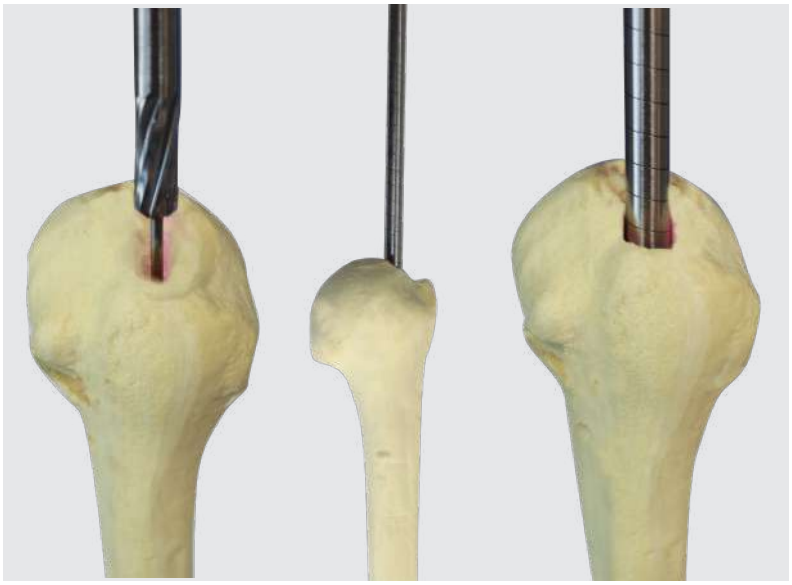
2. Drill with the awl. Place the guide without olive-tip Ø2.0mm.

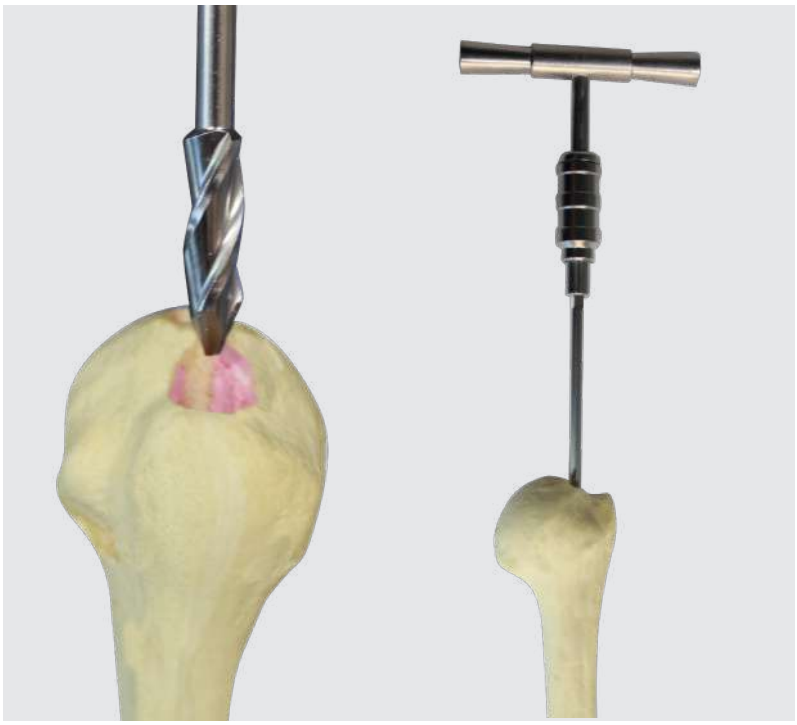
3. Remove the guide.





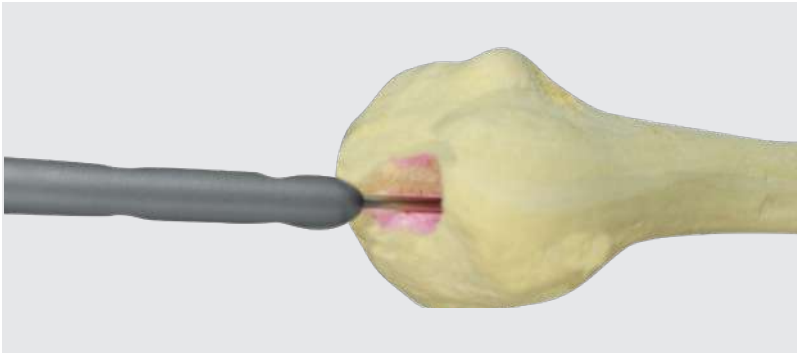
4. The medullary channel is prepared using the rigid reamers and the T-handle. Ream to the size of the nail diameter starting with the smallest diameter reamer.

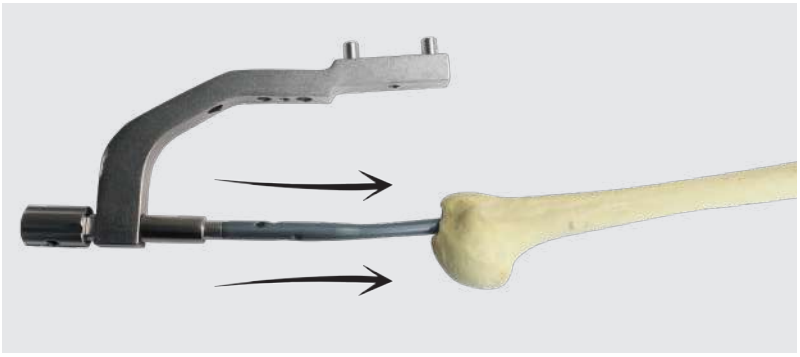




5. Introduce the guide without olive-tip Ø2.0mm.

6. Insert the pin through the guide using a twisting motion; once it reaches the fracture site, ensure that the fracture remains reduced or reduce it if it has not been reduced previously with fluoroscopy.





7. Once the focus of the fracture has been crossed, the impactor can be used, if necessary, to finish inserting the nail. The pin should be positioned approximately 1 cm below the articular surface of the humeral head, which must be verified under fluoroscopy.

8. Remove guide.

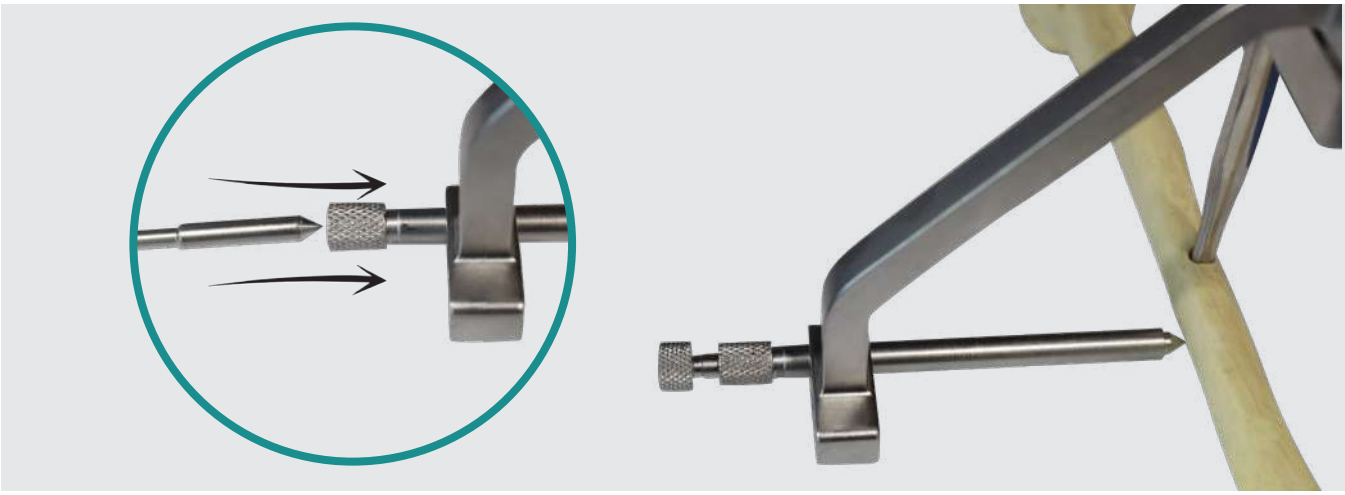
9. The locking strip is placed again on top of the insertion handle as previously performed by tightening the screw with the Allen wrench

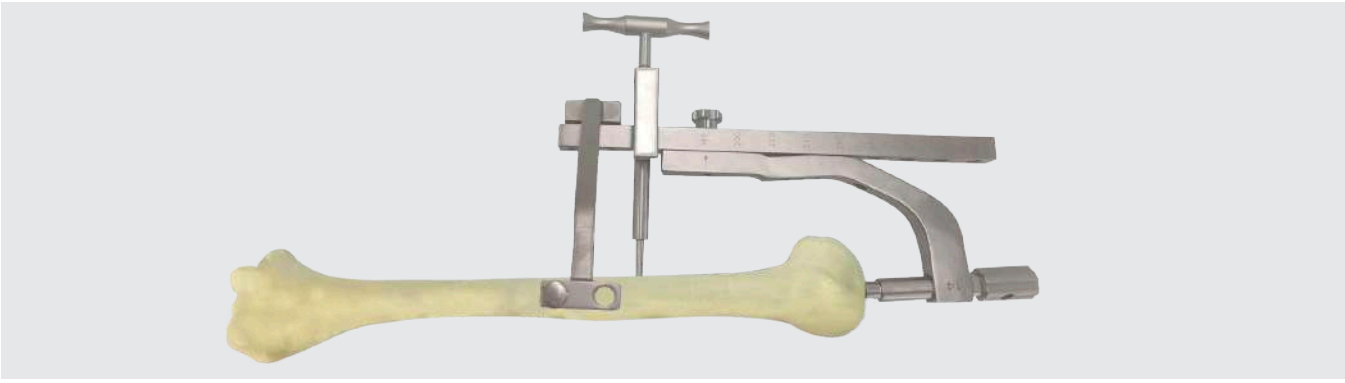
10. Place again the inner and outer sleeves for Ø5.2mm drill bit previously used to verify the equipment. Proceed to perforate the first cortical layer with the drill bit Ø5.2mm.

11.Leave the locking strip and place the distal locking device targeting device previously assembled and then the position rod with the stabilizing device.

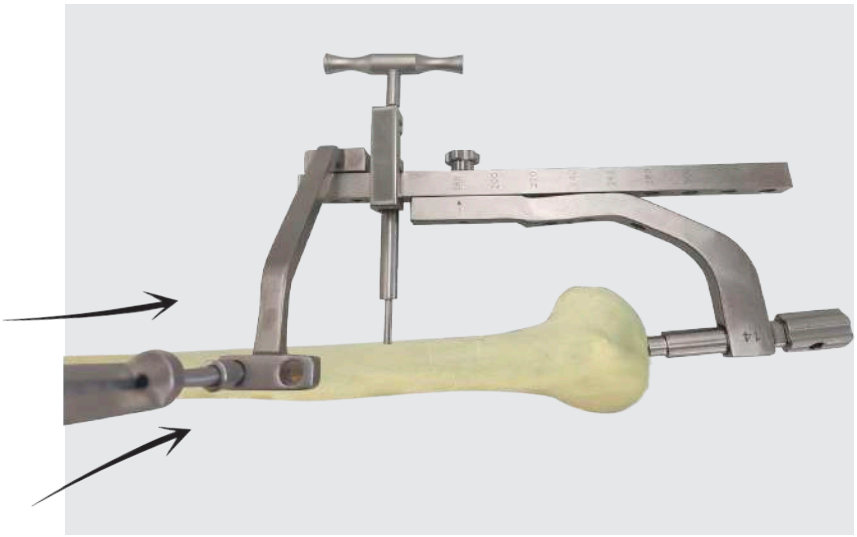
Note: The locking is performed from posterior to anterior.

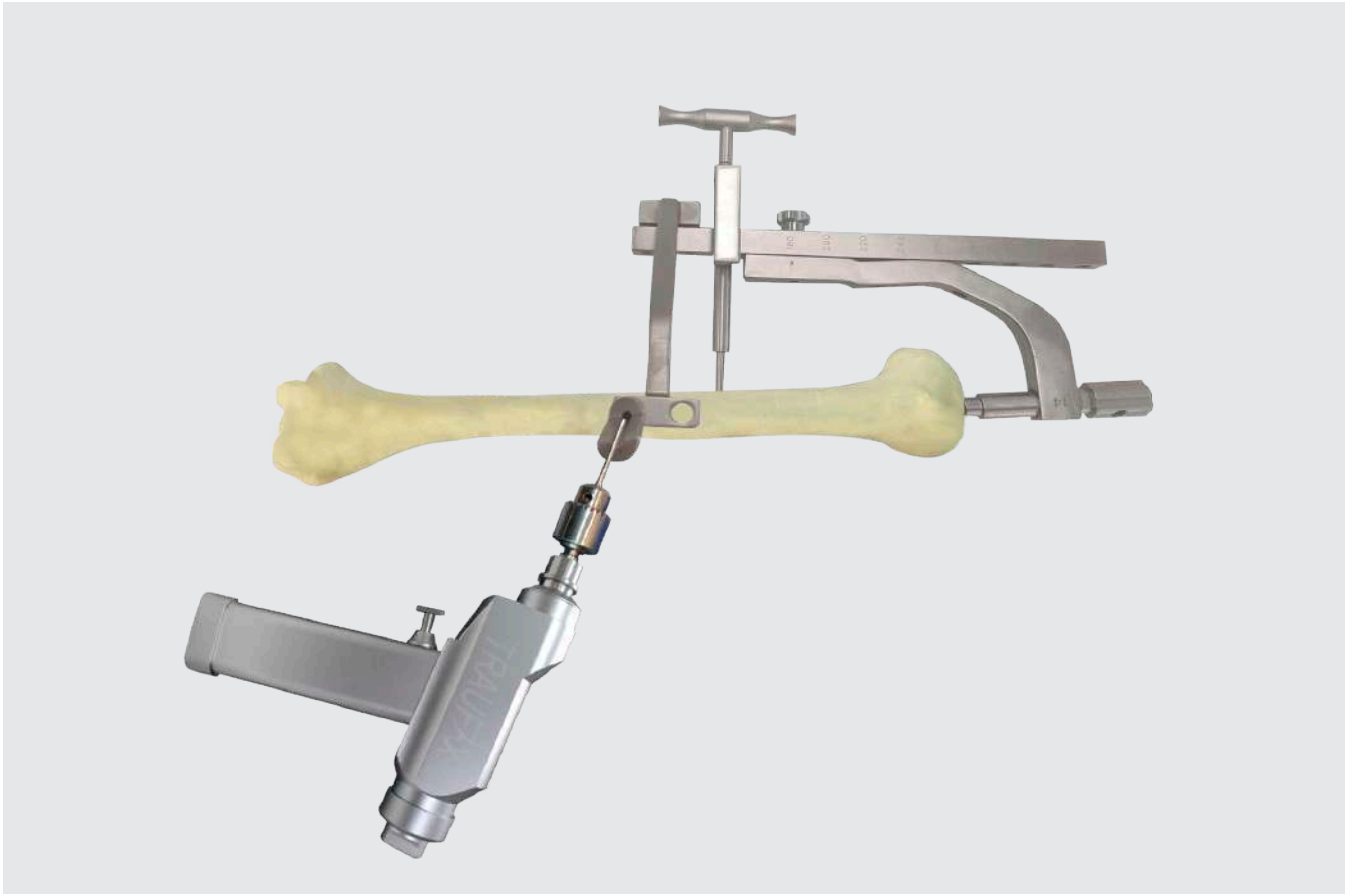
12. With the device locked in place, the awl sleeve and the awl Ø6.0mm is used to start perforating the skin.





13. Both cortices are drilled in the most distal hole with the drill bit Ø2.9mm.



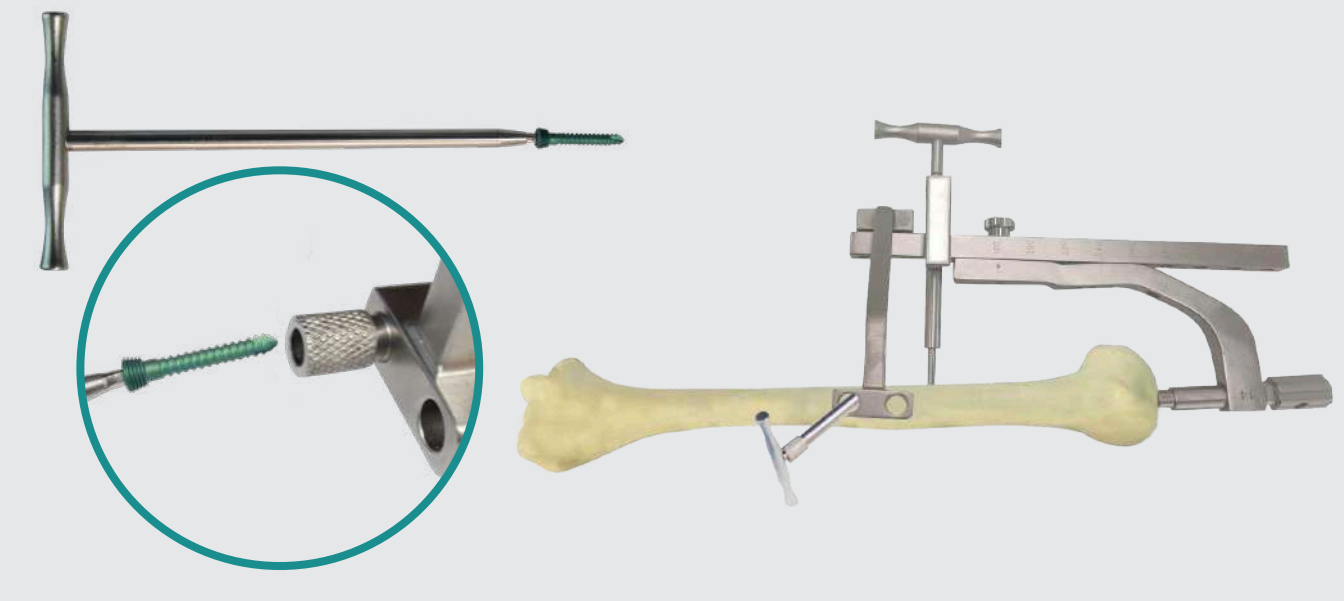


14. Remove the inner sleeve. Measured with the depth meter to determine the length of the locking screw to be used.

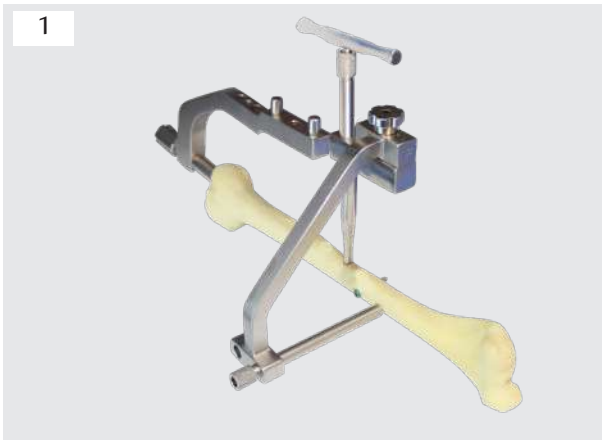
15. Pass the tap Ø3.5mm through the hole

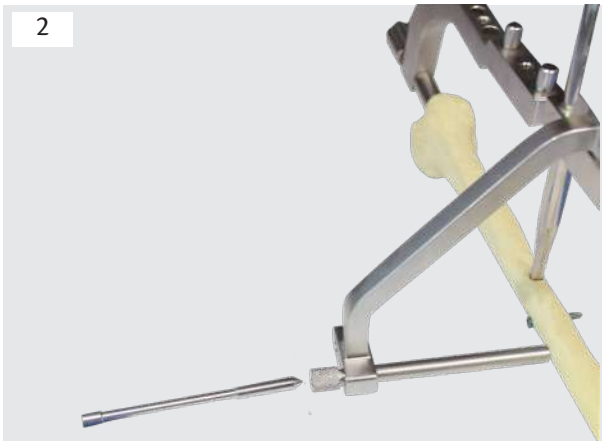
16. With the help of the T-handled drill bit Ø5.2mm, expand the perforation at the beginning of the bone to make room for the locking screw head.

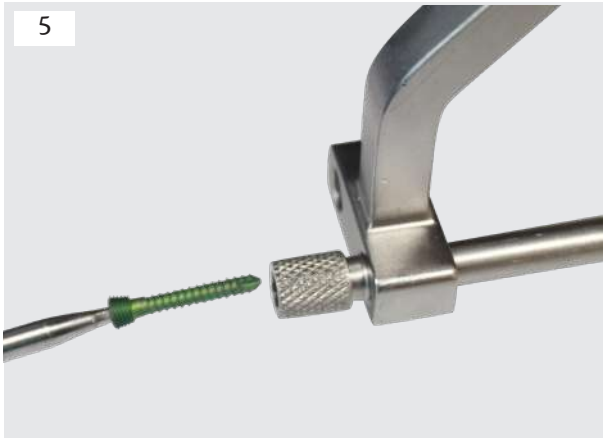
17. Place the locking screw of previously determined length with the help of the screwdriver; it should be completely inside the bone. Confirmation that the nail is locked can be achieved with the help of the olive-tip free guide witout olive-tip



18. Repeat the procedure for the next distal hole.

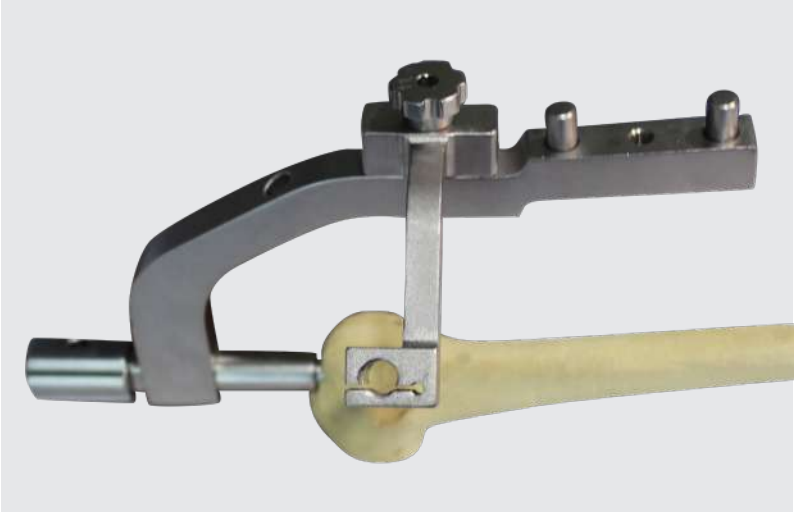




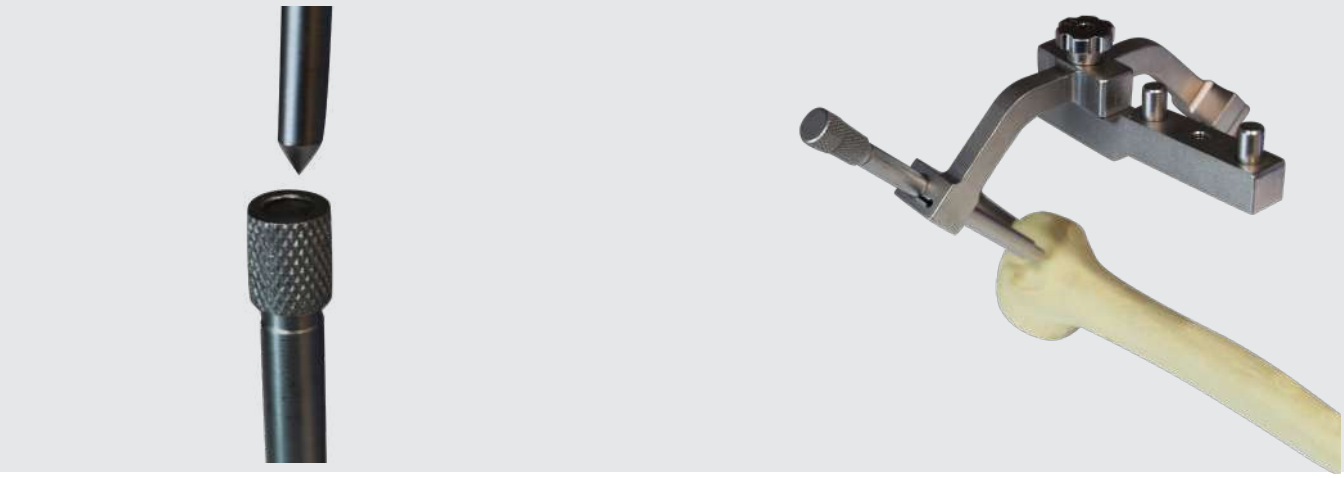


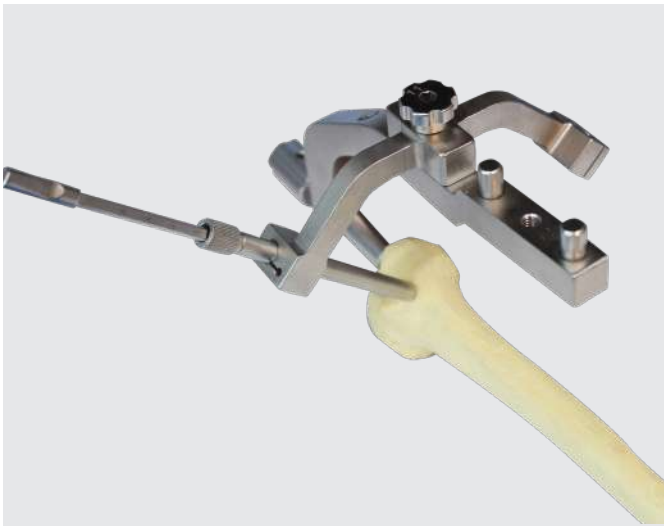
19. Once the distal holes are blocked, remove the distal locking device and disassemble it.

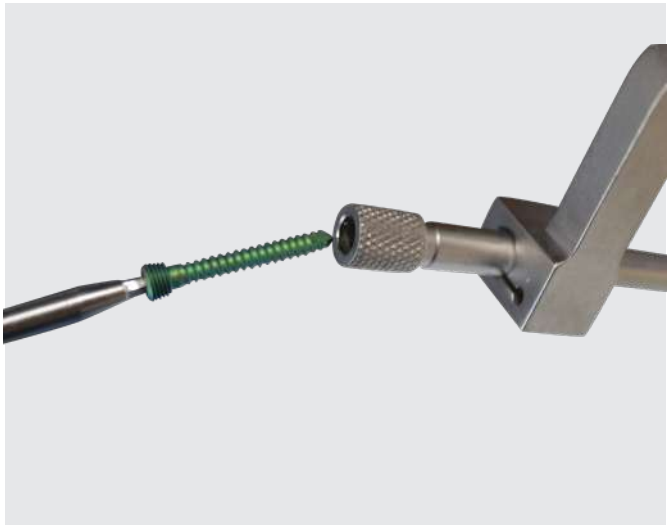
20. Place the proximal locking arm over the insertion handle and fasten it with the screw. Tighten with allen wrench.



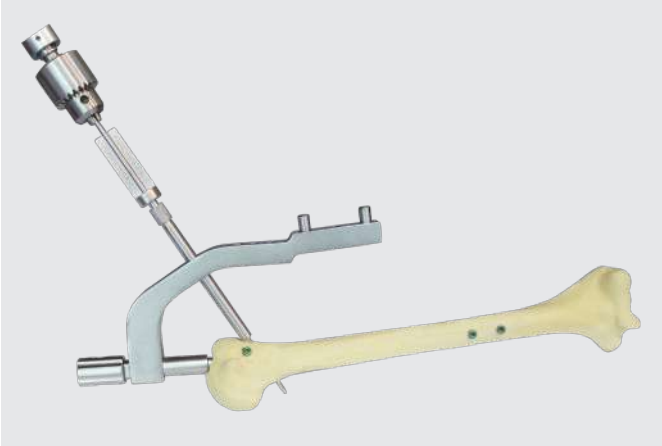
21. Repeat the drilling procedure of both corticals, depth measurement, tapping, drilling and locking screw insertion. Check that it is locked.

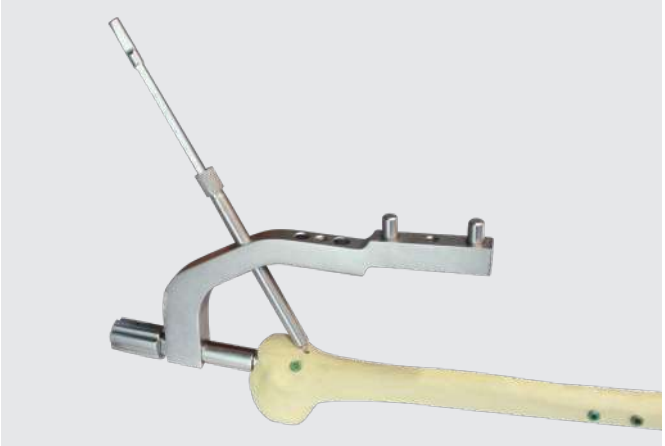


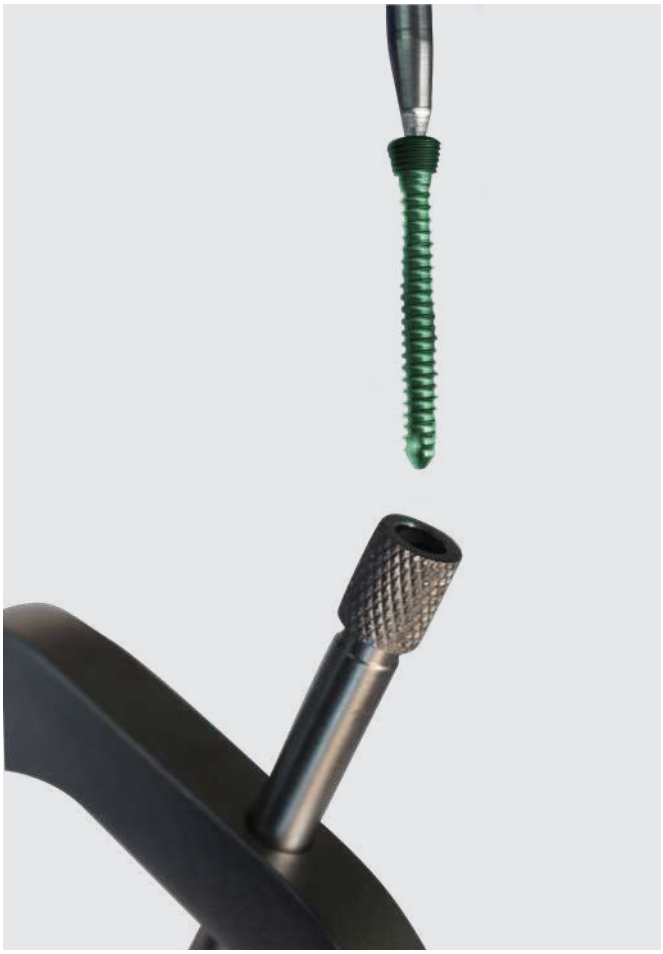


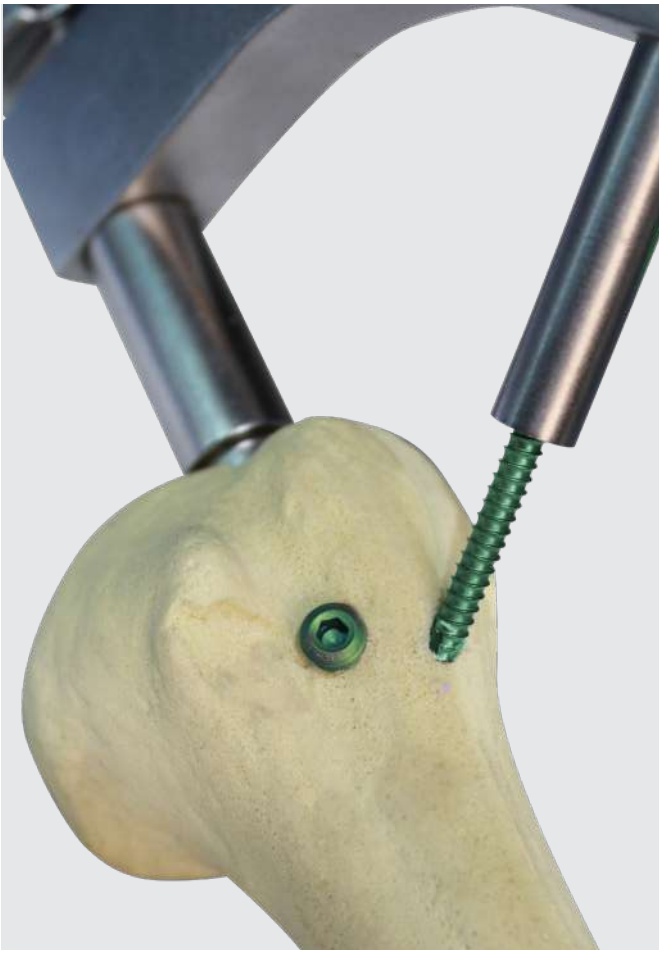


22. Subsequently, if necessary, the angular stability hole in the head of the humerus is locked. To do this, the inner and outer sleeves are placed in the hole in the insertion handle.. Repeat procedure for locking screw placement and confirm that it is locked.









23. Continue blocking the next hole in the arm for proximal locking by repeating the procedure and verify locking screws position under fluoroscopy

24. Once both proximal holes are locked, remove arm and insertion handle.

25. Finally, insert the end cap.

Extraction

1. To remove the nail remove the screws and end cap (if any).

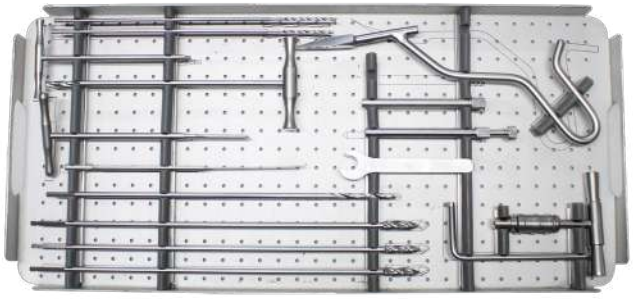
2. Place the universal axial connecting rod.

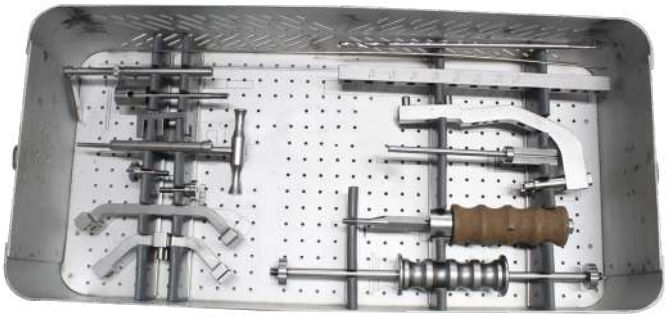
3. Remove tthe nail with the help of the universal axial connecting rod.

4. If required, use sliding impactor.

HUMERUS NAIL EQUIPMENT

QTY.	EQUIPMENT (CODE)
1	Awl (31.05.01)
1	Trocar (Awl) Ø 6.0mm (31.04.60)
1	Trocar (Awl) sleeve Ø 6.0mm (31.06.01)
1	Outer sleeve for graduated guide ø6.0mm (18.11.60)
1	T-handle (12.02.01)
1	Allen wrench 5mm (26.02.50)
1	Wrench 12mm (27.01.12)
1	Reamer Ø 7.5mm (24.02.75), Ø 8.0mm (24.02.80), Ø 8.5mm (24.02.85)
1	Drill bit Ø 5.2mm (13.03.52)
1	Depth meter (16.01.60)
1	Tap Ø 3.5mm (25.02.35)
1	T-handle drill bit Ø5.2mm (13.11.52)
1	T-handle screwdriver for Ø3.5mm screws (11.07.25)
2	Drill bit Ø2.9mm (13.03.29)
1	Guide without olive-tip Ø2.0mm (23.08.20)
1	Insertion handle (40.01.01)
1	Graduated drill guide Ø3.0mm (16.02.50)
1	Universal axial connecting rod (19.04.01)
1	Impactor (30.04.01)
1	Inner and outer sleeve for Ø5.2 drill bit, ø8.0mm (18.10.80)
1	Nail fastener (12.05.01)
1	Stabilizing device (41.03.01)
1	Position rod (42.01.01)
2	Screws (39.02.01 & 39.02.02)
1	Distal targeting device (40.08.01)
1	Proximal locking arm (40.09.01)
1	Locking strip (40.04.02)
1	Sleeve for 6.3mm drill bit (191.01)
1	Drill bit Ø6.3mm x 250mm with AO anchor (13.01.25)
1	Outer sleeve for Ø5.2mm drill bit (18.11.80)
1	Position rod for 7mm nail (448.07)
1	Position rod for 8mm nail (448.08)
2	Humeral nail instruments tray (28.06.01)
1	Humeral nail implants tray (BT-008)





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