SURGICAL TECHNIQUE

Retrograde Femoral Nail

TRAUFIX
READY TO RUN

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TECHNOLOGICAL ADVANTAGES

The retrograde femoral nail is made of titanium (Ti6Al4V ELI), has an innovative locking system, with a 6.4 cannulated screw obtaining a static fixation. It also has a hole in the distal part for the split compression screw that allows better fixation of the fracture in the condyles.

It has an innovative and exclusive system of locking screws with threaded head in its proximal and distal zone, placed by means of an adjustable strip in the proximal and lateral directions, which allows a fast and safe locking without the use of an image intensifier.
Thus improving the reduction either open or closed, decreasing surgical time and tissue damage, compared to other treatment techniques.

SPECIFICATIONS

The retrograde femoral nail is made of high quality titanium of 9, 10, 11, and 12 mm diameter with lengths from 320 to 440 mm.

RETROGRADE FEMORAL NAIL

Diameter 9mm

176.32*	9 mm X 320 mm
176.34*	9 mm X 340 mm
176.36*	9 mm X 360 mm
176.38*	9 mm X 380 mm
176.40	9 mm X 400 mm
176.42	9 mm X 420 mm
176.44	9 mm X 440 mm

Diameter 10mm

174.32*	10 mm X 320 mm
174.34*	10 mm X 340 mm
174.36*	10 mm X 360 mm
174.38*	10 mm X 380 mm
174.40	10 mm X 400 mm
174.42	10 mm X 420 mm
174.44	10 mm X 440 mm

Diameter 11mm

175.32*	11 mm X 320 mm
175.34*	11 mm X 340 mm
175.36*	11 mm X 360 mm
175.38*	11 mm X 380 mm
175.40	11 mm X 400 mm
175.42	11 mm X 420 mm
175.44	11 mm X 440 mm

Diameter 12mm

357.32	12 mm X 320 mm
357.34	12 mm X 340 mm
357.36	12 mm X 360 mm
357.38	12 mm X 380 mm
357.40	12 mm X 400 mm
357.42	12 mm X 420 mm
357.44	12 mm X 440 mm

* Contained in the standard implant set.

SPECIFICATIONS

The short retrograde nail is made of high quality titanium of 9, 10, 11, and 12 mm diameter with lengths of 180 to 240 mm.

SHORT RETROGRADE FEMORAL NAIL

Diameter 9mm

161.24*	9 mm X 240 mm
161.26*	9 mm X 260 mm

Diameter 10mm

159.24*	10 mm X 240 mm
159.26*	10 mm X 260 mm

Diameter 11mm

160.24*	11 mm X 240 mm
160.26*	11 mm X 260 mm

Diameter 12mm

356.24	12 mm X 240 mm
356.26	12 mm X 260 mm

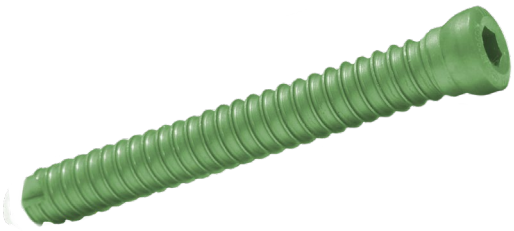
* Contained in the standard implant set.

4.5 mm LOCKING SCREW FOR INTRAMEDULLARY NAIL

166.15	4.5 mm X 15 mm	166.60	4.5 mm X 60 mm
166.20	4.5 mm X 20 mm	166.65	4.5 mm X 65 mm
166.25	4.5 mm X 25 mm	166.70	4.5 mm X 70 mm
166.30	4.5 mm X 30 mm	166.75	4.5 mm X 75 mm
166.35	4.5 mm X 35 mm	166.80	4.5 mm X 80 mm
166.40	4.5 mm X 40 mm	166.85	4.5 mm X 85 mm
166.45	4.5 mm X 45 mm	166.90	4.5 mm X 90 mm
166.50	4.5 mm X 50 mm	166.95	4.5 mm X 95 mm
166.55	4.5 mm X 55 mm	166.100	4.5 mm X 100 mm

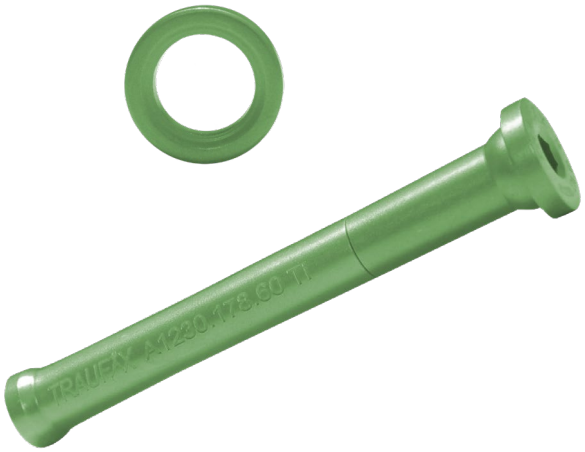
6.4 mm SCREW FOR RETROGRADE NAIL

179.25	6.4mm X 25 mm	179.75	6.4mm X 75 mm
179.30	6.4mm X 30 mm	179.80	6.4mm X 80 mm
179.35	6.4mm X 35 mm	179.85	6.4mm X 85 mm
179.40	6.4mm X 40 mm	179.90	6.4mm X 90 mm
179.45	6.4mm X 45 mm	179.95	6.4mm X 95 mm
179.50	6.4mm X 50 mm	179.100	6.4mm X 100 mm
179.55	6.4mm X 55 mm	179.105	6.4mm X 105 mm
179.60	6.4mm X 60 mm	179.110	6.4mm X 110 mm
179.65	6.4mm X 65 mm	179.115	6.4mm X 115 mm
179.70	6.4mm X 70 mm	179.120	6.4mm X 120 mm



6.4 mm COMPRESSION SCREW FOR RETROGRADE NAIL (WASHER INCLUDED)

178.40	6.4 mm X 40 mm
178.45	6.4 mm X 45 mm
178.50	6.4 mm X 50 mm
178.55	6.4 mm X 55 mm
178.60	6.4 mm X 60 mm
178.65	6.4 mm X 65 mm
178.70	6.4 mm X 70 mm
178.75	6.4 mm X 75 mm
178.80	6.4 mm X 80 mm
178.85	6.4 mm X 85 mm
178.90	6.4 mm X 90 mm
178.95	6.4 mm X 95 mm
178.100	6.4 mm X 100 mm
178.105	6.4 mm X 105 mm
178.110	6.4 mm X 110 mm
178.115	6.4 mm X 115 mm
178.120	6.4 mm X 120 mm



END CAP FOR FEMORAL NAIL

CODE 168.12

Surgical Indications

-For fractures of the femur diaphysis.
-For distal femur fractures.

General contraindications

-Systemic inflammatory response syndrome (to be assessed by the surgeon).
-Blood Poisoning
-Osteomyelitis
-Patient unable to comply with postoperative care.
-Hypersensitivity to materials (titanium).

DESCRIPTION OF THE SURGICAL TECHNIQUE

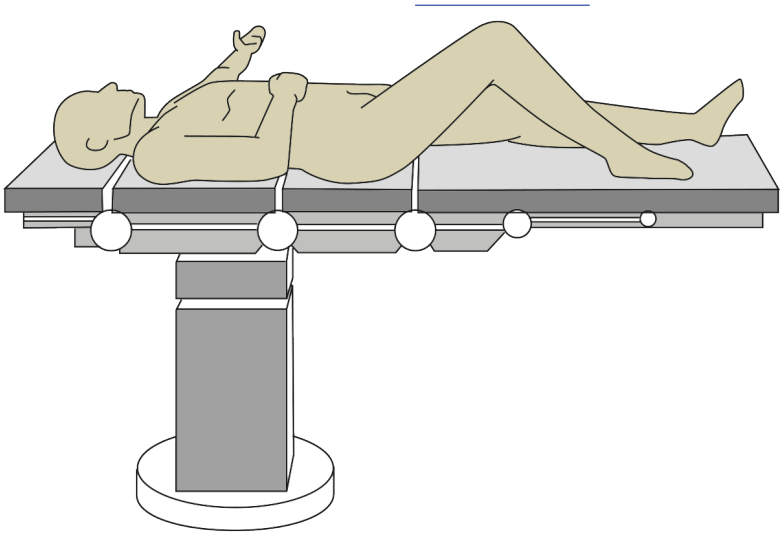
Pre-surgical planning

Select the diameter and nail length to use.
Use X-ray strips is recommended

Preparation of the patient:

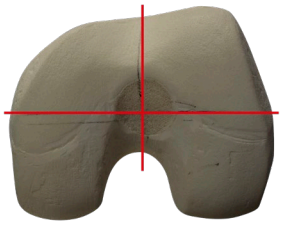
1. Position of the patient in supine decubitus with 90° flexion of the knee.

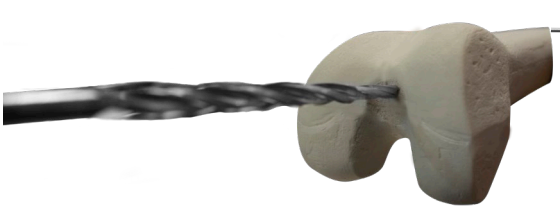
2. Anterior knee approach.



Caution
This technique is suggested to describe the use of the instrument and implant, not aiming to interfere with the experience and decisions of the traumatologist considering his/her vast clinical and surgical experience to determine the best proposal for each particular patient.

3. Proceed to enhance the opening of the channel with 6.4mm bit, or through the threaded guide wire to locate channel and entry point, and then use the cannulated punch.



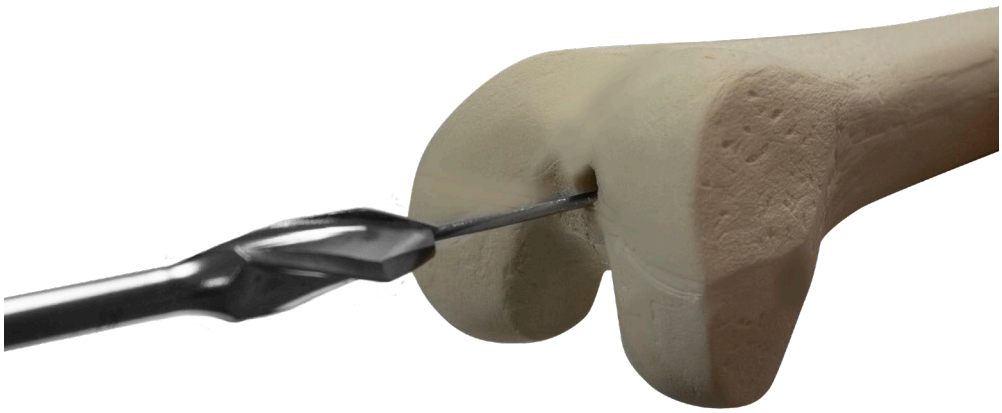


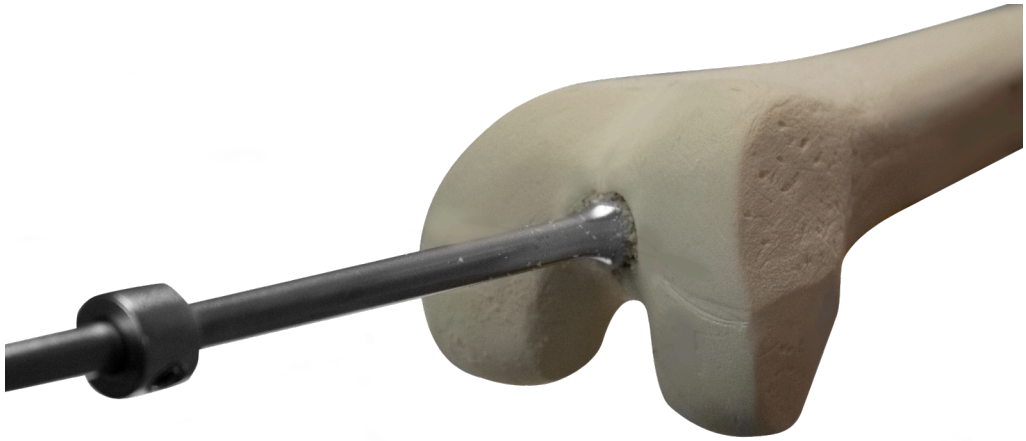
4. The guide is placed smoothly with or without olive, depending on surgical plan.

With olive

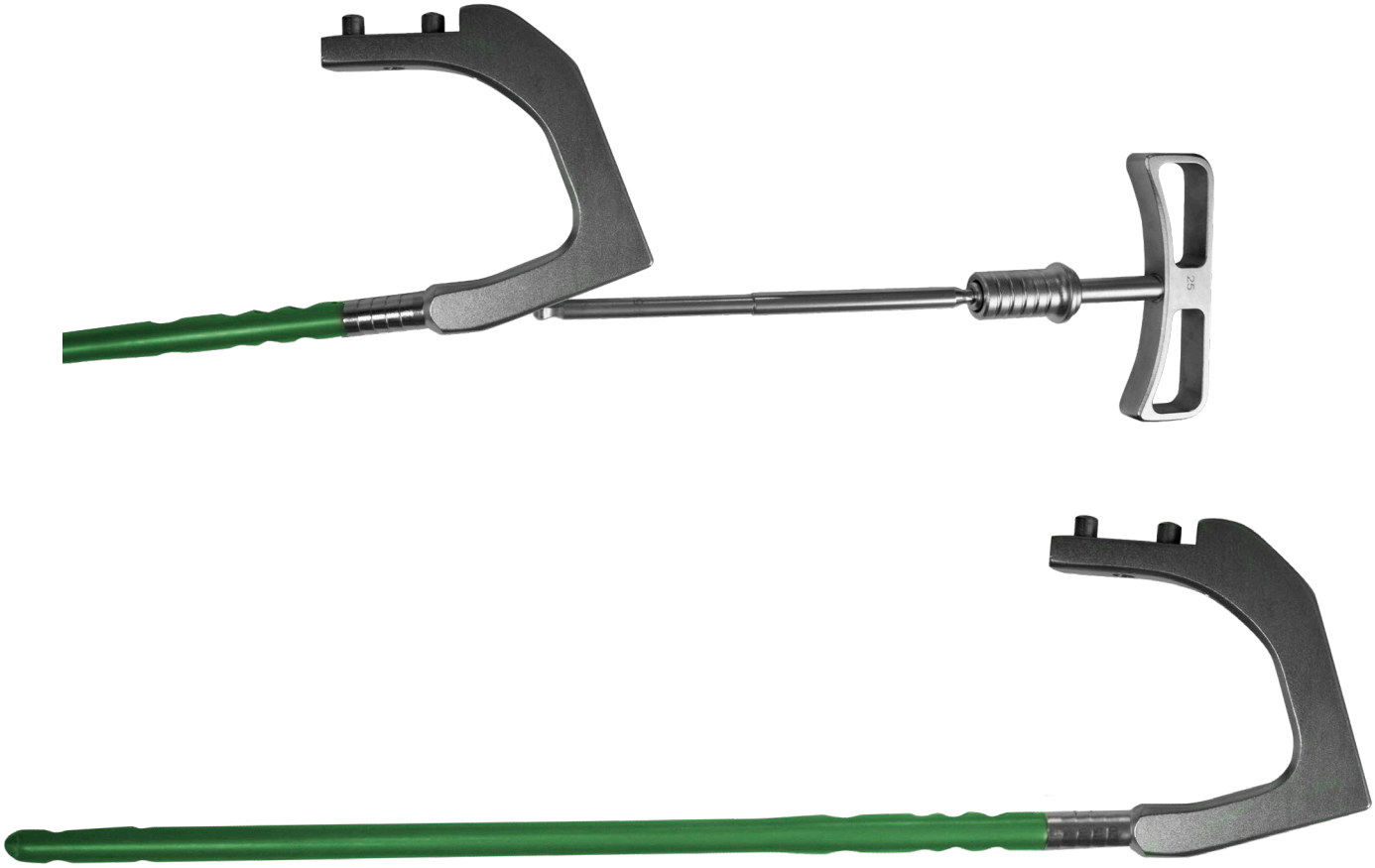
No olive

5. Apply rigid 12mm diameter bit to make nail inlet, the limit will be determined by the length of the spiral blade.





6. The frame with the nail is assembled, "the direction of the lock will be determined by the direction of the U-strip".



7. Proceeds to place strip for retrograde nail. Indicate the length of the nail. It is useful for long nails starting from the 320mm (the strip is also used for short nails, but one is added for longer ones).

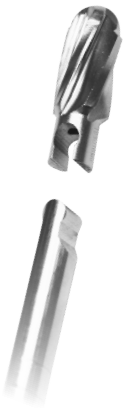
*Note: it must be calibrated before inserting the nail.

For long nails:
Place graduated strip according to nail length.
Place mobile head.
Place 6.3 sleeve and align with butterfly nail bore.

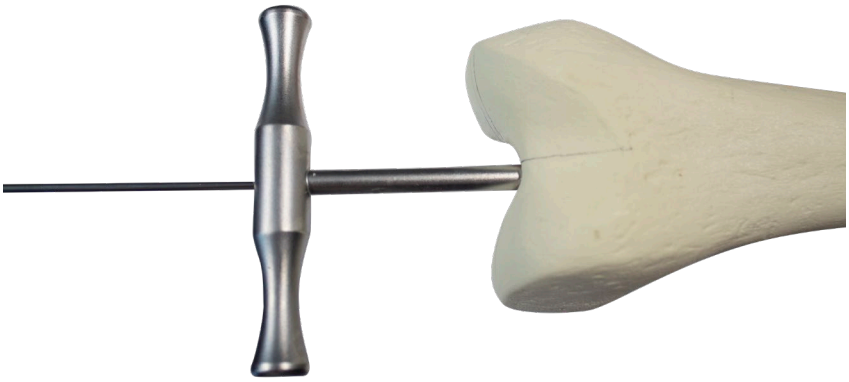
Note: for short nails, it is not necessary to use additional strips
Note: Confirm the calibration of all locks.

8. If you want to ream, the reaming has to be a measure above the diameter of the femur, the reamer tips increase by 0.5mm.

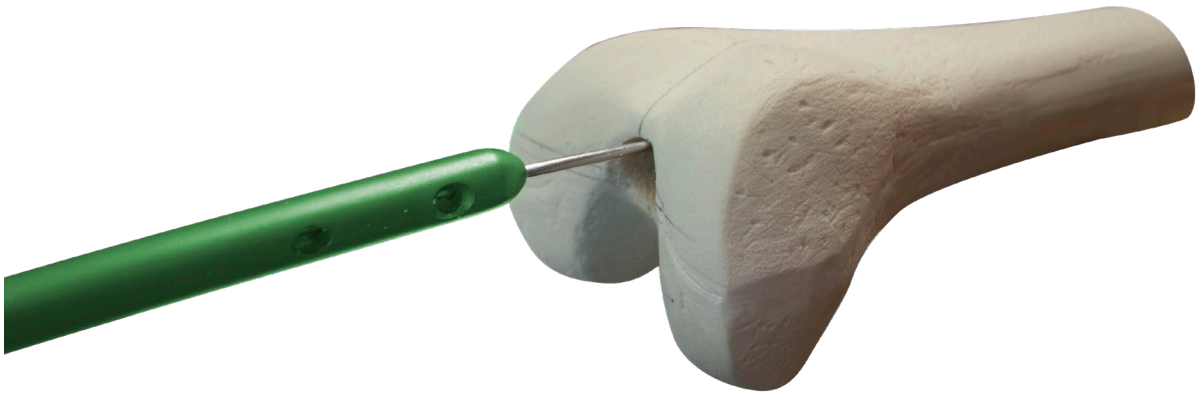
Nail	Recommended reamer
9 mm	10 mm
10 mm	11 mm
11 mm	12 mm
12 mm	13 mm



9. The system has a reducing handle. Once reaming is finished, proceed to introduce the T-handle reducer, maintaining the reduction in order to be able to change from guide with olive to one without olive. Reduce fracture with the help of reducing guide.



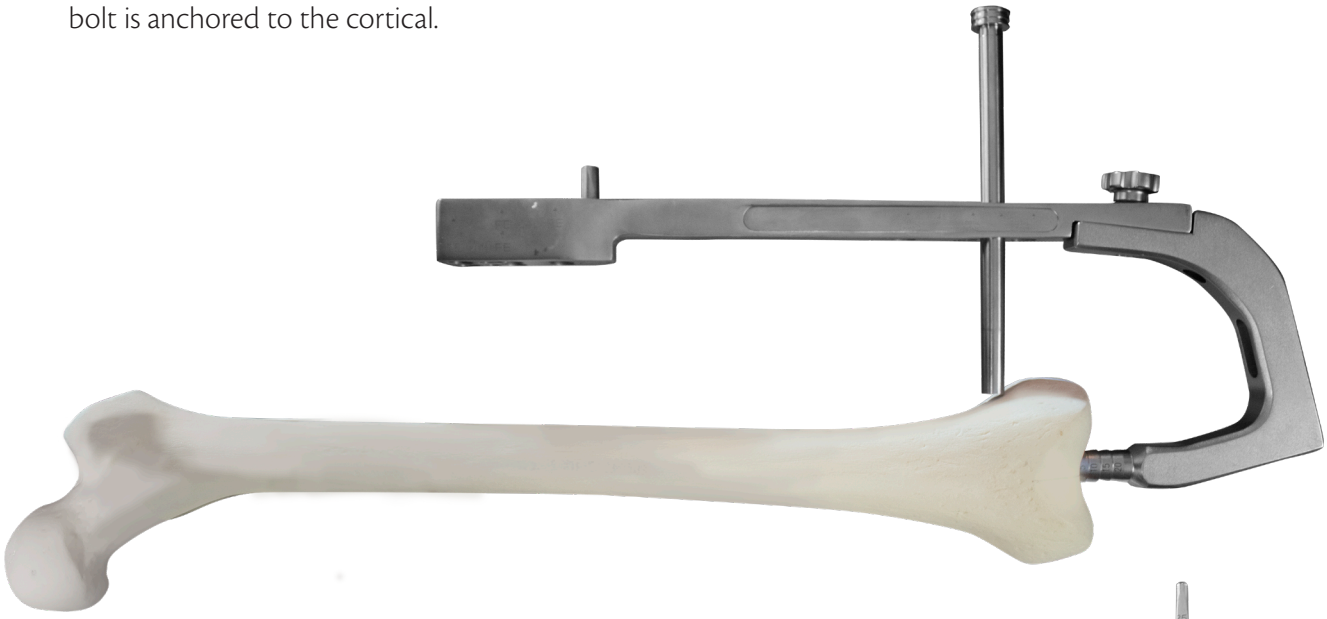
10. The nail is inserted, aware that the direction of the nail will be determined by the location of the U-handle. The impactor can be used to insert the nail, if necessary.



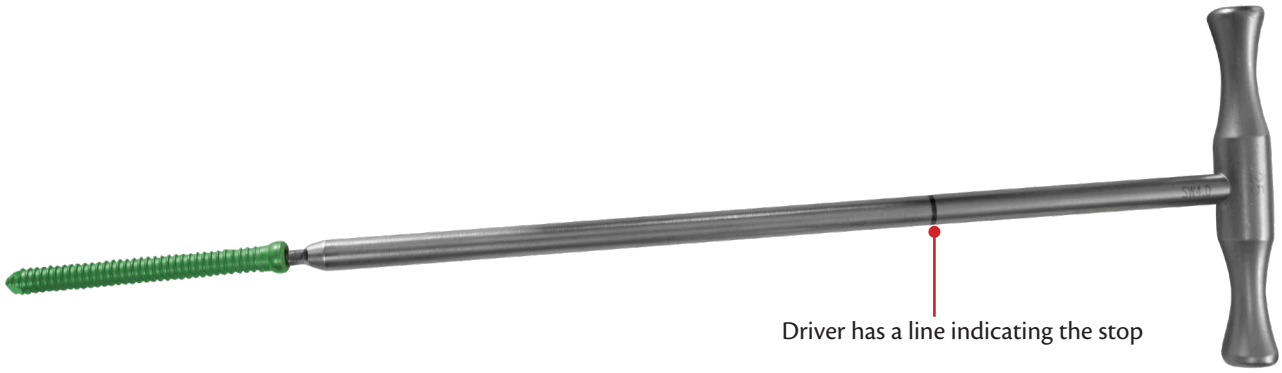
The nail fastener frame has 4 notches 5 mm apart between each one, which will determine the fixation limit of the nail.

*If you want to place condillary compression screw, it is recommended to insert the nail to the notch marked "0".

11. Proceed to start the locks, starting in the condillary region, a 10 mm outer sleeve is placed directed towards the second hole of the nail through the strip, then a 5.2mm inner sleeve is placed, drilled with 5.2mm bit until the second cortical, measurement is made with depth meter. The 6.4mm screw is inserted, the screwdriver has a line indicating the stop, it is recommended to make 3 turns so that the bolt is anchored to the cortical.

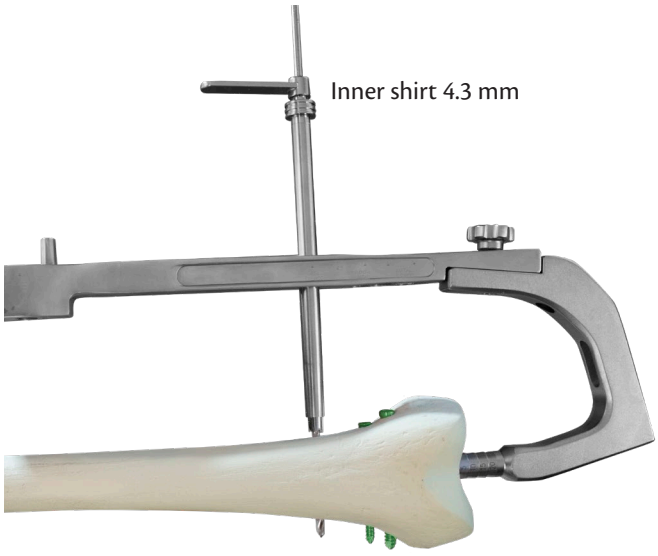


Inner 5.2mm sleeve

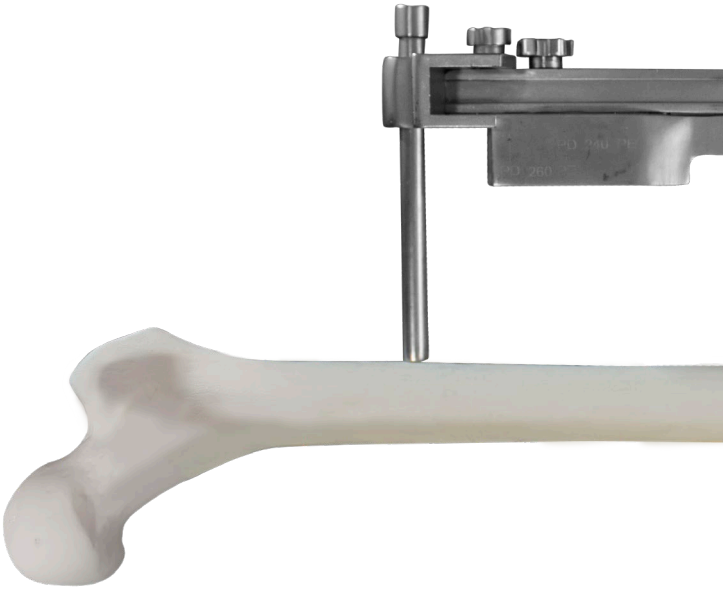

Driver has a line indicating the stop

12. 10mm outer sleeve is placed in the third nail hole, 4.3mm inner sleeve is placed, then drilled with 4.3mm bit, 4.3mm sleeve is removed for measurement, 5.2mm sleeve is placed to use 4.5mm tap, 4.5mm screw is placed.

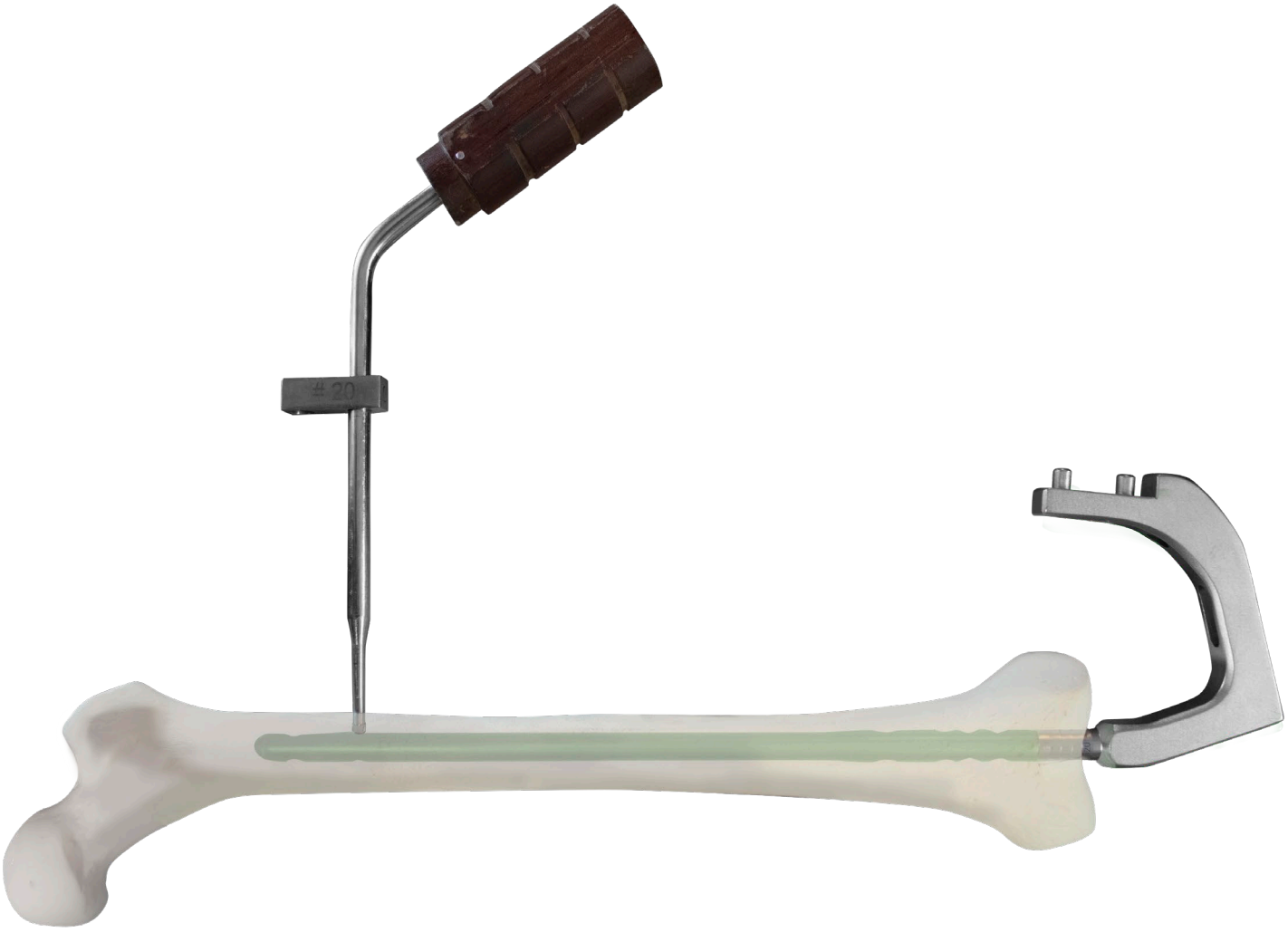
13. In case of using the dynamic hole which is the 4th, the previous steps are applied.



14. Proceed to start the proximal locks, By means of the graduated strip, the 6.3 sleeve is placed in the second proximal hole to make drilling with the 6.3mm bit, only the first cortical will be perforated, this hole will allow us to place our locking device which will allow us to make the blockage more proximal.



* The second proximal hole is designed for locking device introduction; the way to know it is positioned correctly is because the nail moves in block next to the device as a test mechanism. It is also a locking hole.



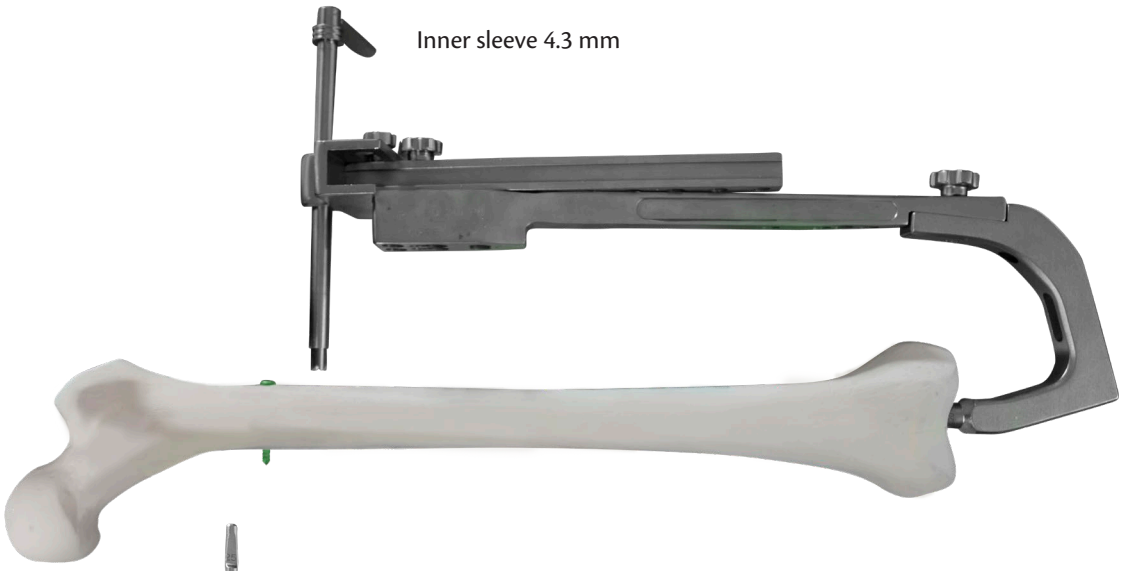
15. Proceed to drill the first proximal hole, place 10mm outer sleeve, internal 4.3mm using 4.3mm bit. 4.3mm inner sleeve is removed. It is measured, 5.2mm sleeve is placed for tapping, 4.5mm screw is placed.

Inner sleeve 4.3 mm

Inner sleeve 5.2 mm

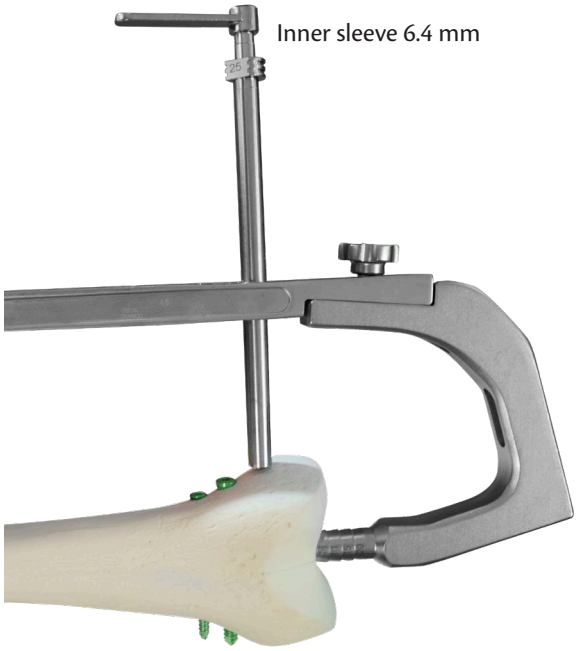

20

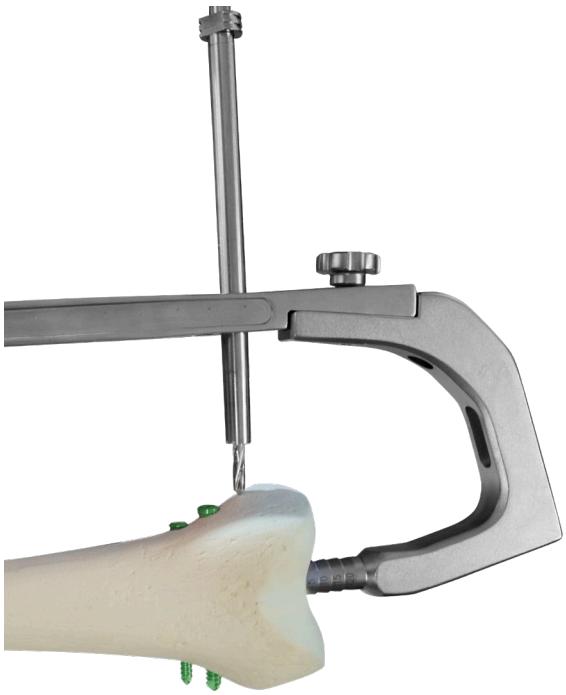
16. The locking device is removed, strip is placed again, using 10mm outer sleeve 4.3 mm inner sleeve, 4.3m internal sleeve is removed for measurement, proceed to place 5.2mm sleeve to use the 4.5mm tap, 4.5mm screw is placed.

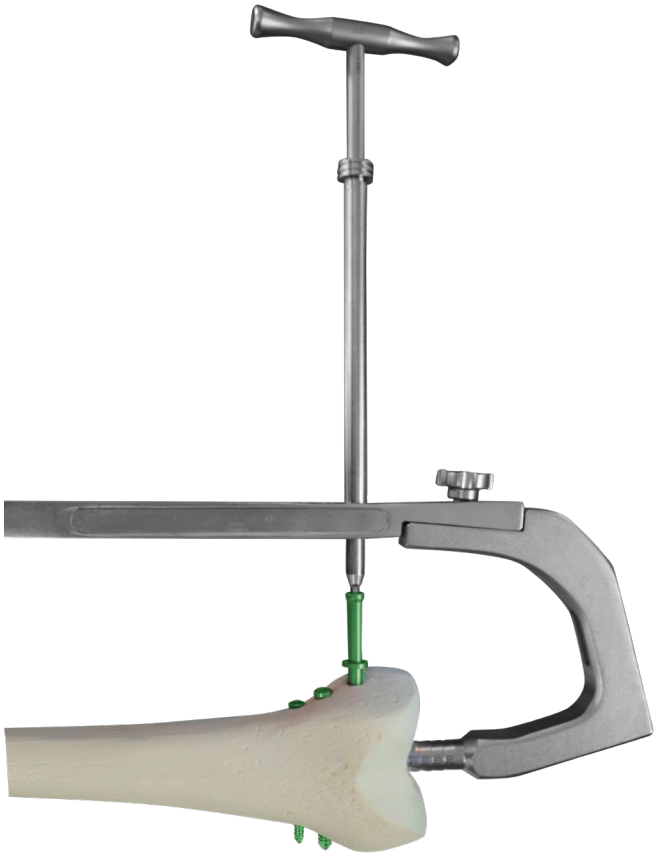


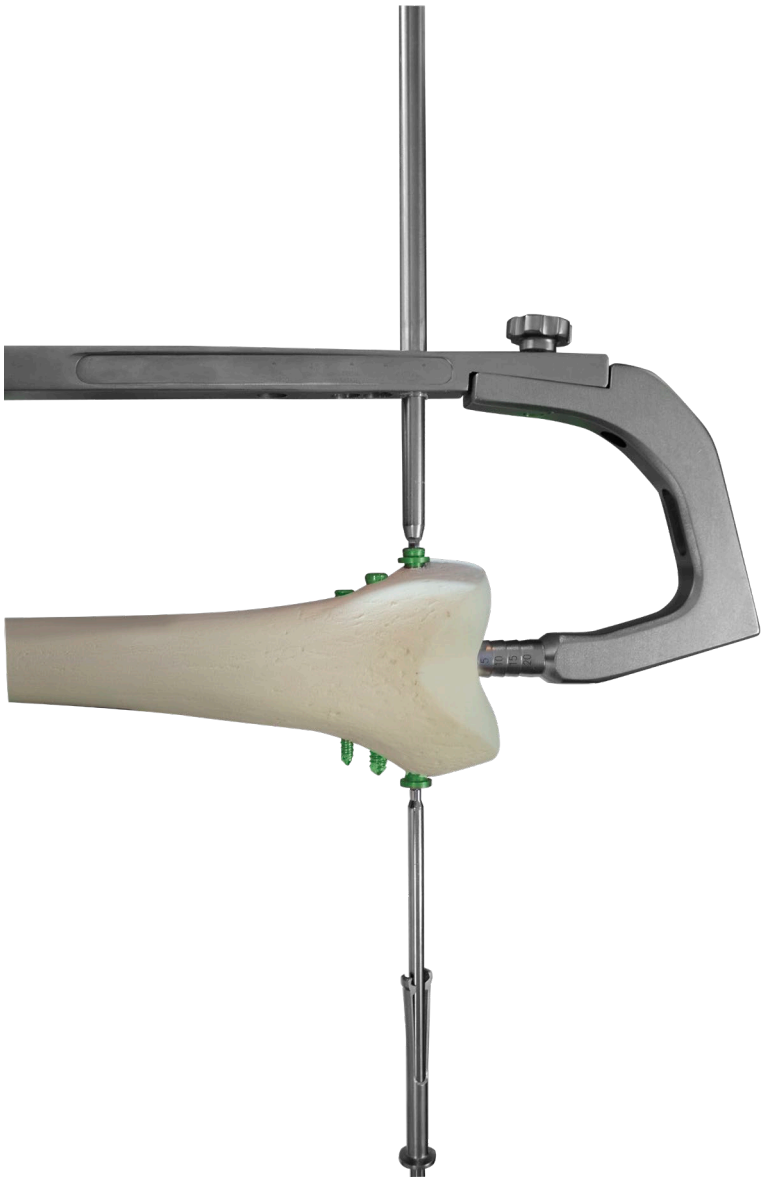
*If required

For condillary compression screw placement, 10mm outer sleeve – 6.4mm inner – is placed, drilled with 6.4mm bit from lateral to medial, 6.4mm sleeve is removed and the length for the bolt is measured, when inserting the screw the locking bushing with its washer must be removed and placed through the medial condyle and compression with 3.5mm hexagonal screwdrivers is initiated at both sides of the bolt.



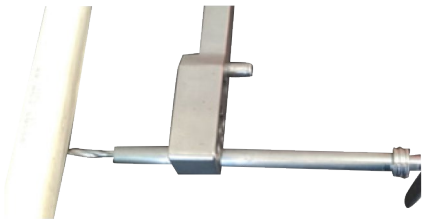


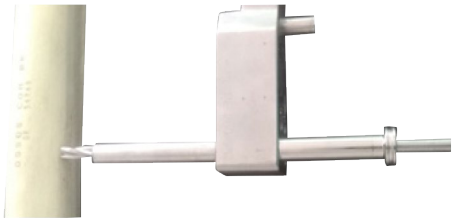


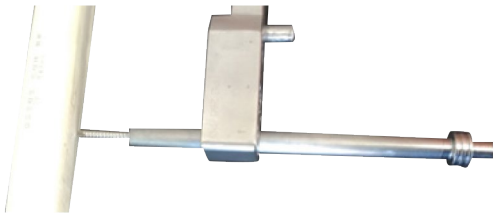


Block next holes short nail

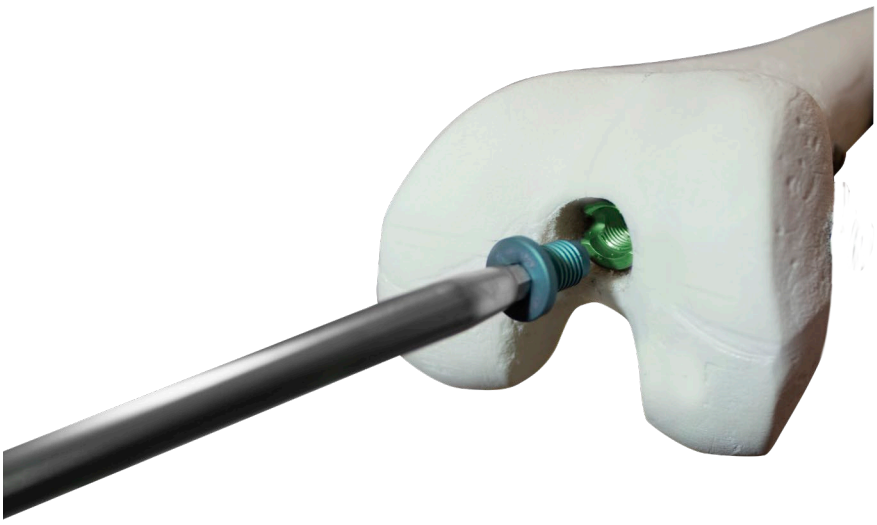
1. Place outer and inner sleeve for 4.3 mm bit.
2. Drill both corticals with the 4.3 mm bit.
3. Remove inner sleeve and measure depth with the help of the depth meter.
4. With the help of the T-handled drill bit, drill the first 5mm in order to make room for the head of the screw.
5. Insert screw with the help of the screwdriver. It must be completely inside the bone.





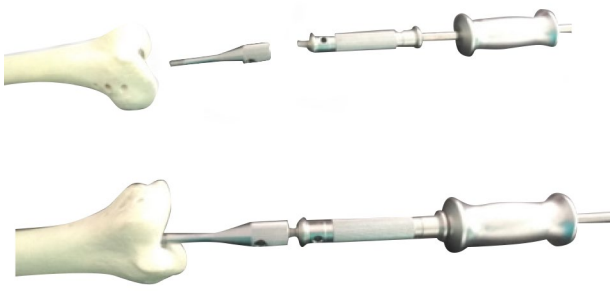


Proceed to remove the strip and place the closure cap.



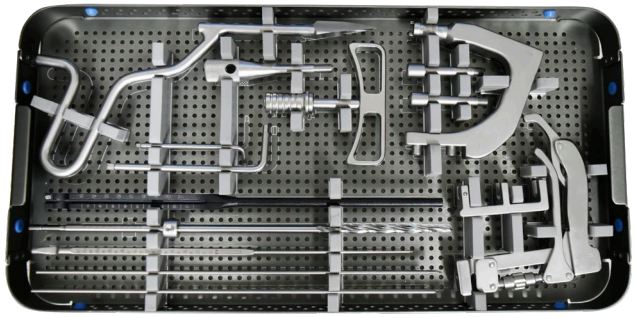
Extraction

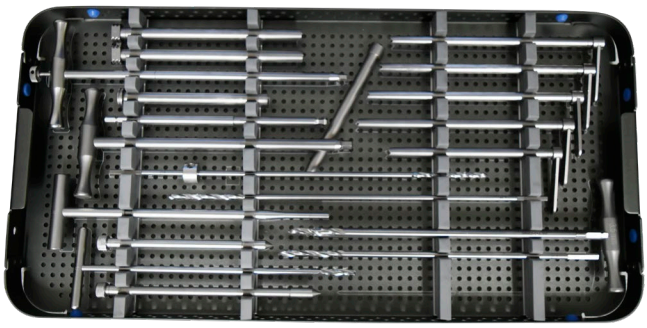
1. Remove all but one locking screw used to stabilize the nail while inserting the extractor.
2. Remove closure cap, if any.
3. Place mobile extractor.
4. Remove the locking screw that was left.
5. Remove the nail, if necessary, use the sliding impactor.

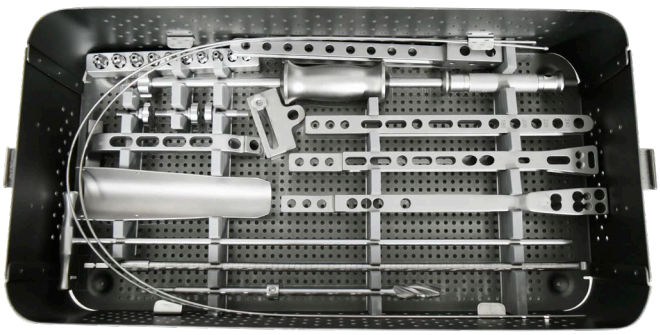


INSTRUMENTS

QTY	
1	Initiator punch
1	Universal extractor
1	Small Allen wrench
1	Big Allen Wrench
1	Fast anchor T-handle
1	Guide Wire Meter 120
1	Graduated drill bit with stop 6.4
6	Depth meter 115 mm
1	Guide wire (3 threaded tips/3 smooth) 2.5 x 35cm
1	Nail fastener screw
1	U-blocking strip
1	Guide wire positioner
2	Distal probe block
1	Outer sleeve 8.0
1	Sliding screw screwdriver 6.5
1	Short Outer Sleeve 8.0
1	Hexagonal disarm tip with quick anchor for nail clamping 6.5
1	Hexagonal disarm with T-handle for bolt 4.5
1	T-handled probe
1	Short Tissue Dilator (Punch) - 8.0
1	T-handled drill 5.0
1	Long-tissue dilator (Punch) - 8.0
1	Inner sleeve 2.5
1	inner sleeve 6.4
1	Inner sleeve 4.3
1	Inner sleeve 4.3
1	Inner sleeve 5.2
1	Bit with stop 4.3 x 30cm
1	Bit 4.3 x 30cm
1	Hexagonal T-handle screwdriver
10	Bit 5.2 x 25 cm
1	Reamer-tipped set Ø 8.5 Ø 9.0 Ø 9.5 Ø 10.0 Ø10.5 Ø11.0 Ø 11.5 Ø12.0 Ø12.5 Ø13.0







3	Impactor/pin
1	Strip screw
1	Distal/palpable locking devices
1	Tissue protector
1	T-handle tramodular guide
1	Flexible Reamer
1	Initiator bit with stop 13
1	Distal strip 180-240
1	Proximal and subtrotertroter blockage strip (Block to femoral head)
1	Distal strip 320-440
1	Olive-tipped wire guide 2.5
1	Bit 6.3
1	Sleeve 6.3
1	Olive-free guide
1	Accesory
1	Screw for accessory
1	Special strip
1	Retrograde strip
1	Distal locking device

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