

Expert (Smart) Tibia Nail

Surgical Technique



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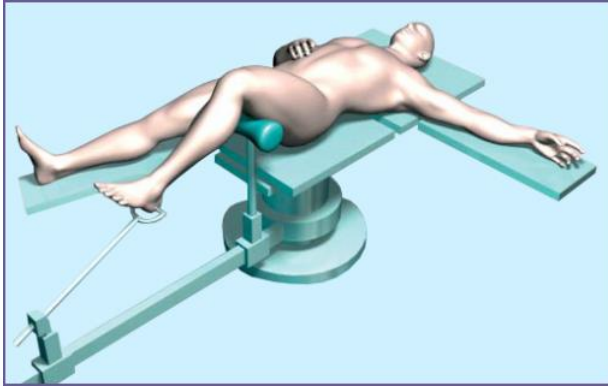
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Indications



The Expert Tibia Nail is used to treat pre- and postisthmic fractures, open and closed tibial shaft fractures, proximal and distal tibia and tibial shaft fractures, as well as tibial malunions and nonunions.



1. Position the Patient

Place the patient on the radiolucent table in a supine position. Make sure that the affected leg's knee can be bent at least 90 degrees. Place the image intensifier so that it is possible to see the tibia in AP and lateral views, including the articular surface proximally and distally.

The surgery can alternatively be carried out on a fracture table with the leg under traction.

Note:

If the tibial plateau cannot be seen in the AP view, the knee roll can be positioned under the lower portion of the thigh.

2. Reduce Fracture

Manually do closed reduction while intensifying the image via axial traction. In some situations, using the Large Distractor may be suitable.

Instruments

731.018 Femoral Distractor Two in One

Note:

In order to implant a nail in an epiphyseal fracture, the condyles or the pilon must first be repaired.



3. Confirm Nail Length & Diameter

After the lower leg fracture has been reduced, the required nail length must be determined.

Note:

When calculating the nail length, compression or dynamization must be taken into consideration. If the technique calls for active compression, a shorter nail should be used.

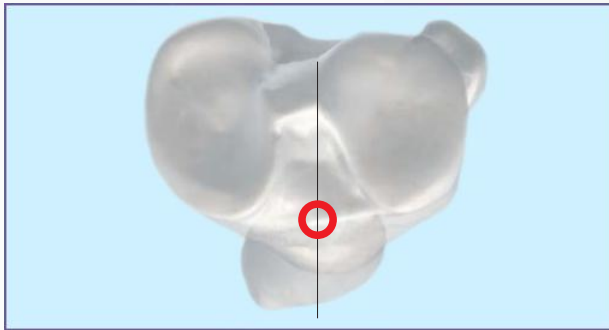
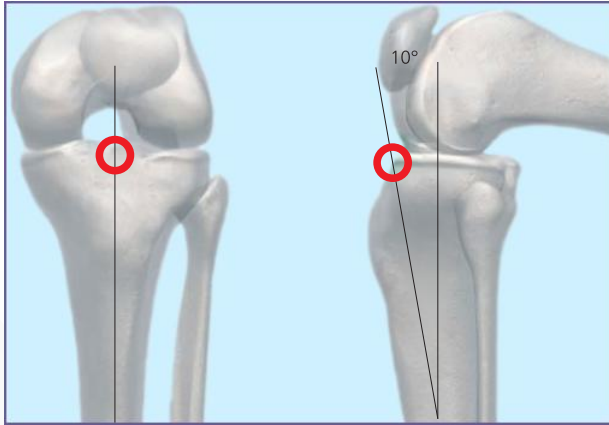
Consider making a second incision during the placement of the locking screw in obese patients. The second incision should be made at the site where the protection sleeve enters the body, close to the main incision.

4. Approach

Make an incision parallel to the intra-medullary canal's central axis. This incision may be transpatellar, medial, or even lateral parapatellar, depending on the patient's anatomy.

The tibial tuberosity is reached through an incision that extends proximally from the distal portion of the patella along the patellar ligament.

Without opening the synovia, move the infrapatellar corpus adiposum laterally and dorsally. It must be ensured that the nail has unrestricted access to the insertion location. Prepare the entry site of the nail on the ventral edge of the tibial plateau.

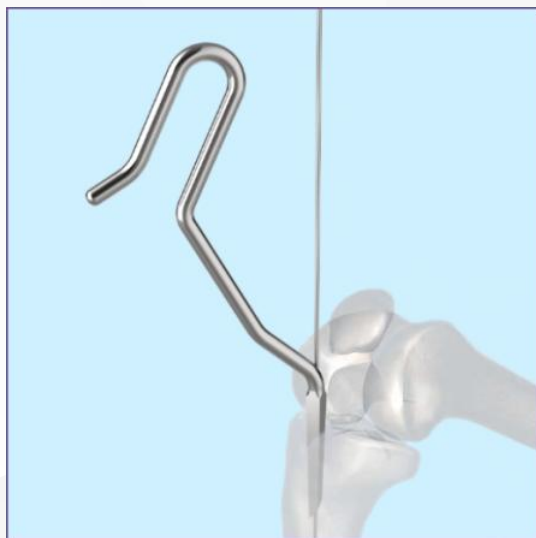
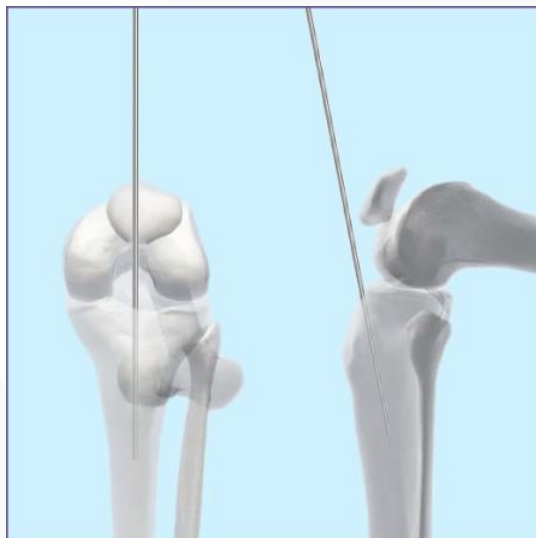


5. Determine Entry Point

The ideal placement of the nail in the intramedullary canal is determined by the entry point. For the purpose of avoiding fragment displacement, this is especially crucial for proximal and distal third fractures.

In AP view, the entry point is parallel to both the lateral tubercle of the intercondylar eminence and the axis of the intramedullary canal.

The entry site is located near the ventral margin of the tibial plateau in lateral view.



6. Insertion of Guide wire and opening medullary canal

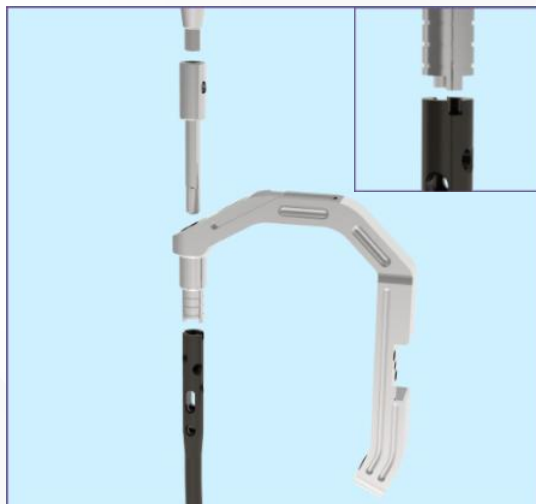
Instruments

- 804.013 Guide Wire 2.5mm Length 950mm
- 802.001C Cannulated Bone Awl Diamond Pointed
- 805.003 Reamer for Nail Neck 12mm
- 724.001 Flexible Reaming Shaft
- 724.095 Bit for Flexible Reaming Shaft 9.5mm

Open the medullary canal with the cannulated awl in place. Advance the Awl by twisting it to a depth of around 8 to 10 cm and insert the stopper guide wire.

Place starting reamer over the guide wire. Using flexible reamer and bit, ream the medullary canal.





1. Assemble the Instrument with Desired Nail

Instruments

- 812.001 Tibia Insertion Handle
- 812.003 Connecting Bolt for Expert Tibia Nail
- 811.040 T Handle Hexagonal Wrench
8.0mm for universal

With the help of conical bolt connect insertion handle and nail, with the help of 8mm Hexagonal Wrench.



2. Inserting The Nail

Instruments

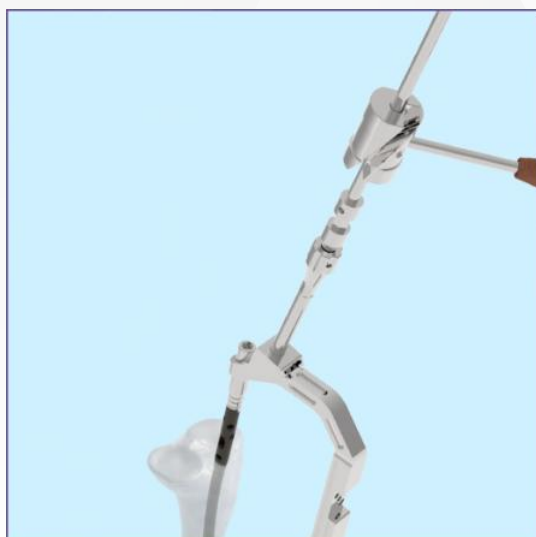
- 811.033 Connector For Hammer Guide
- 811.032 Hammer Guide
- 811.036 Slotted Hammer with Handle

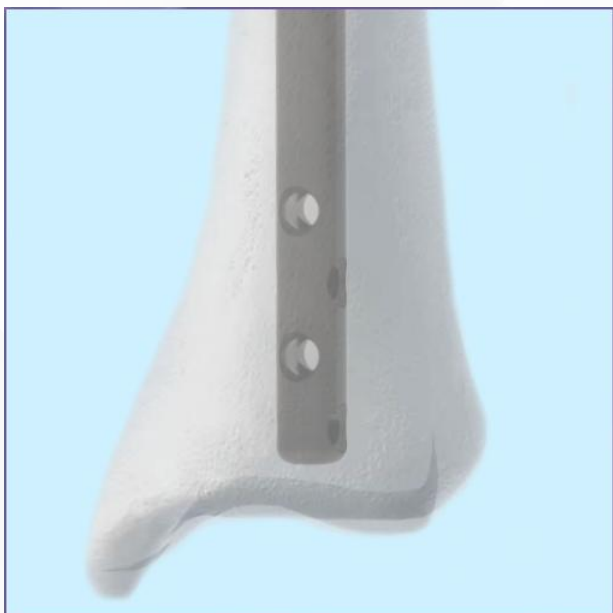
Enter the intramedullary canal with the nail. To move the nail, use a twisting motion.

Keep an eye on the nail as it crosses the crack; use two planes of control to prevent misalignment.

The nail should be inserted until it reaches the tibial opening or less. Check the AP and lateral views for the final nail position.

Additionally, use connector for hammer guide and hammer guide to hammer nail inside using hammer.





3. Check distal nail position

Check final nail position under image intensification in AP and lateral views.

Note:

Insertion depth is important for distal third fractures because the distal segment needs to be stabilized with at least two locking screws inserted below the fracture line.

Different Locking Position are shown below



Proximal Segment Fractures

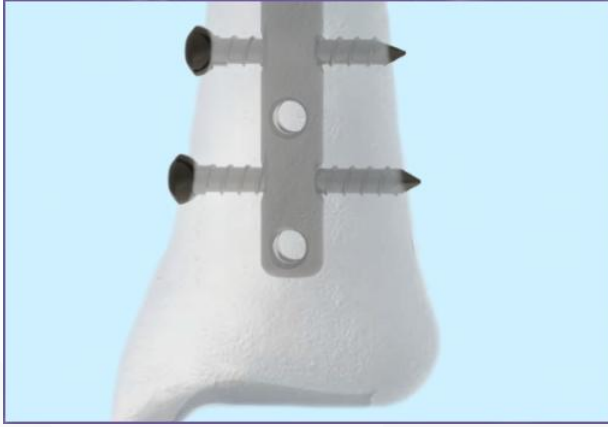
It is advisable to lock the nail with the knee extended for proximal fractures. In addition to relieving strain on the soft tissue often induced by tibia nail insertion tools, this balances the quadriceps mechanism's pressures that cause deforming stresses on proximal fragments. Additionally, from this position, rotational alignment may be evaluated more easily before locking.

Diaphyseal Segment Fractures

It is advised to lock distally first for diaphyseal fractures to enable intraoperative compression.

Distal Segment Fractures

Locking distally first is advised for distal fractures in order to aid reduction.



It is advised to lock distally first so that you could use the backstroke technique to avoid reduction loss. Make sure the nail is placed at the proper depth.

If possible, the leg should be stretched when locking the tibia nail from the medial side. This position makes it easier to control the rotation of the tibia axis prior to locking by reducing the forces generated by the quadriceps muscle that would otherwise tend to distort the proximal fragment.

After the two cortices, immediately halt drilling and remove the drill bit from the radiolucent drive.

Make sure the drill bit is positioned correctly beyond the distant cortex.

Utilizing the Depth Gauge for Screws, measure the length of the screw. Make sure the hook is holding the distant cortex and the outer sleeve is in touch with the bone.

The Depth Gauge at the back of the outer sleeve can be used to directly determine the Screw length.

Insert the appropriate length Screw using the Screwdriver, if needed.

Verify Screw length under image intensification. If needed, a second Screw may be inserted using the same technique.



1. Mount the Aiming Arm

Instruments

- 812.001 Tibia Insertion Handle
- 812.002 Aiming Arm for Expert Tibia nail
- 812.003 Connecting Bolt for Expert Tibia Nail
- 811.038A Connecting bolt for aiming arm & Distal Bar

Verify that the Insertion Handle is firmly attached to the nail. The Insertion Handle should be mounted to the Aiming Arm.

Note:

Avoid applying pressure to the aiming arm, the protection sleeve, the drill sleeves, or the drill bits. Through the proximal locking holes, these stresses might make it difficult to target precisely and damage the drill bits.



2. Drill and Determine The screw length

Instruments

- 805A.003 Tibia Insertion Handle
- 805A.005 Aiming Arm for Expert Tibia nail
- 805A.006 Connecting Bolt for Expert Tibia Nail
- 602.030 Connecting bolt for aiming arm & Distal Bar
- 804A.008 Depth Gauge for Tibia / Femoral XL Nail

Make the required hole in the aiming arm for the trocar combo (Protection Sleeve, Trocar), make a stab incision, and insert the trocar into the bone. Take away the Trocar.

Insert the drill sleeve, drill to the desired length, and then measure the screw length using the depth gauge.



3. Insert Screw

Instruments

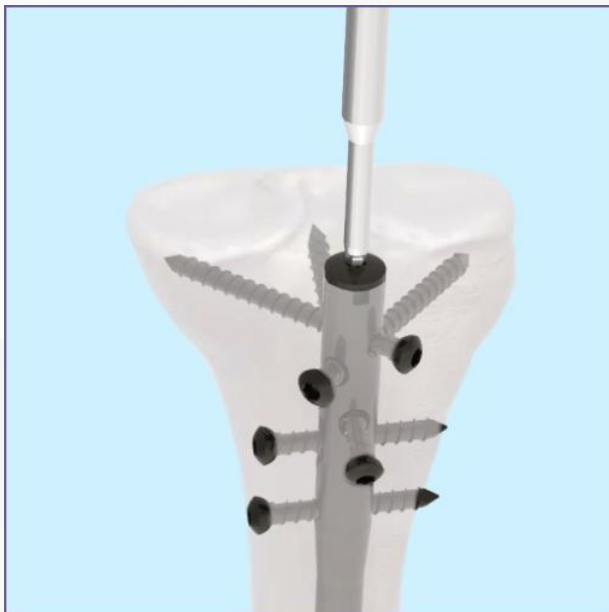
805A.003 Protection Sleeve 10.0/8.0mm for
Tibia / Femoral XL Nail

804.010 Hexagonal Screw Driver 3.5mm Tip
Long for 4.9mm Bolt

Utilizing the screwdriver, insert the screw of the proper length through the protection sleeve. Verify Locking Screw length under image intensification.

The tip of the Locking Screw should not project more than 1–2 mm beyond the far cortex.

Insertion of End Cap



Instruments

804.010 Hexagonal Screw Driver 3.5mm Tip
Long for 4.9mm Bolt

Remove nail insertion instruments.
With the help of screw driver insert the end cap.

Note:

For ease of End Cap insertion, the leg needs to be in flexion position.

Removal of Implant



Instruments

- | | |
|---------|---|
| 804.010 | Hexagonal Screw Driver 3.5mm Tip
Long for 4.9mm Bolt |
| 805.008 | Tibia / Femoral XL Nail Extractor Attachment |
| 811.032 | Hammer Guide |
| 811.036 | Slotted Hammer with Handle |

The removal of implants is an optional procedures.

Remove all Screw form the nail.

Insert nail Extractor attachment and connect hammer guide and remove the nail.



Expert (Smart) Tibia Nail for Stainless Steel

9mm Dia. Code No.	10mm Dia. Code No.	11mm Dia. Code No.	Length (mm)
375D.285	375D.285	375D.285	285
375D.300	375D.300	375D.300	300
375D.315	375D.315	375D.315	315
375D.330	375D.330	375D.330	330
375D.345	375D.345	375D.345	345
375D.360	375D.360	375D.360	360
375D.375	375D.375	375D.375	375
375D.390	375D.390	375D.390	390

Expert (Smart) Tibia Nail for Titanium

9mm Dia. Code No.	10mm Dia. Code No.	11mm Dia. Code No.	Length (mm)
T375D.285	T375D.285	T375D.285	285
T375D.300	T375D.300	T375D.300	300
T375D.315	T375D.315	T375D.315	315
T375D.330	T375D.330	T375D.330	330
T375D.345	T375D.345	T375D.345	345
T375D.360	T375D.360	T375D.360	360
T375D.375	T375D.375	T375D.375	375
T375D.390	T375D.390	T375D.390	390



4.9mm Interlocking Bolt

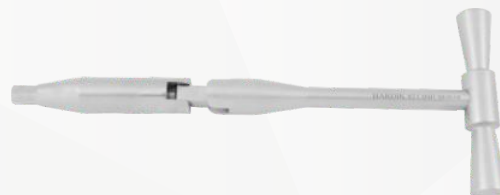
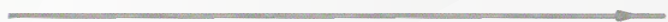
SS Code No.	Titanium Code No.	Length (mm)
353.22	T353.22	22
353.24	T353.24	24
353.26	T353.26	26
353.28	T353.28	28
353.30	T353.30	30
353.32	T353.32	32
353.34	T353.34	34
353.36	T353.36	36
353.38	T353.38	38
353.40	T353.40	40
353.42	T353.42	42
353.44	T353.44	44
353.46	T353.46	46
353.48	T353.48	48
353.50	T353.50	50
353.52	T353.52	52
353.54	T353.54	54
353.56	T353.56	56
353.58	T353.58	58
353.60	T353.60	60
353.65	T353.65	65
353.70	T353.70	70



End Cap for Expert Tibia Nail

SS Code No.	Titanium Code No.
355.15	T355.15

812.001 Tibia Insertion Handle	812.002 Aiming Arm for Expert Tibia nail
	
812.003 Connecting Bolt for Expert Tibia Nail	811.038A Connecting bolt for aiming arm & Distal Bar
	
805A.003 Protection Sleeve 10.0/8.0mm for Tibia / Femoral XL Nail	805A.005 Drill Sleeve 8.0/4.0mm for Tibia / Femoral XL Nail
	
805A.006 Pointer 8.0mm for Tibia / Femoral XL Nail	811.033 Connector For Hammer Guide
	
812.008 Tibia Radiographic Ruler	804A.008 Depth Gauge for Tibia / Femoral XL Nail
	

811.032 Hammer Guide**802.001C Cannulated Bone Awl Diamond Pointed****811.036 Slotted Hammer with Handle****811.040 T Handle Hexagonal Wrench 8.0mm for universal****805.003 Reamer for Nail Neck 12mm****805.007 4mm Tommy Bar****804.010 Hexagonal Screw Driver 3.5mm Tip Long for 4.9mm Bolt****804.011 Medullary Tube****804.012 Stopper Guide Wire 2.5mm Length 950mm****804.013 Guide Wire 2.5mm Length 950mm**

802.002 Tissue Protector 	602.030 Drill Bits 4.0mm x 300mm for Jacobs Chuck 
724.001 Flexible Reaming Shaft 	724 Bit for Flexible Reaming Shaft 9.0mm, 9.5mm, 10.0mm, 10.5mm, 11.0mm, 11.5mm, 12.0mm 
811.022 Combination Wrench 11mm 	805.008 Tibia / Femoral XL Nail Extractor Attachment 

AGC.07 Instrument for Expert Tibia Nail Set

Instruments

812.001	Tibia Insertion Handle
812.002	Aiming Arm for Expert Tibia nail
812.003	Connecting Bolt for Expert Tibia Nail
805A.003	Protection Sleeve 10.0/8.0mm for Tibia / Femoral XL Nail
805A.005	Drill Sleeve 8.0/4.0mm for Tibia / Femoral XL Nail
805A.006	Pointer 8.0mm for Tibia / Femoral XL Nail
811.033	Connector For Hammer Guide
812.008	Tibia Radiographic Ruler
804A.008	Depth Gauge for Tibia / Femoral XL Nail
811.032	Hammer Guide
802.001C	Cannulated Bone Awl Diamond Pointed
811.036	Slotted Hammer with Handle
811.040	T Handle Hexagonal Wrench 8.0mm for universal
805.003	Reamer for Nail Neck 12mm
805.007	4mm Tommy Bar
804.010	Hexagonal Screw Driver 3.5mm Tip Long for 4.9mm Bolt
804.011	Medullary Tube
804.012	Stopper Guide Wire 2.5mm Length 950mm
804.013	Guide Wire 2.5mm Length 950mm
802.002	Tissue Protector
602.030	Drill Bits 4.0mm x 300mm for Jacobs Chuck
811.022	Combination Wrench 11mm
805.008	Tibia / Femoral XL Nail Extractor Attachment
811.038A	Connecting bolt for aiming arm & Distal Bar
724.001	Flexible Reaming Shaft
724	Bit for Flexible Reaming Shaft 9.0mm, 9.5mm, 10.0mm, 10.5mm, 11.0mm, 11.5mm, 12.0mm

Implants

353	4.9mm Interlocking Bolt Length : 22mm, 24mm, 26mm, 28mm, 30mm, 32mm, 34mm, 36mm, 38mm, 40mm, 42mm, 44mm, 46mm, 48mm, 50mm, 52mm, 54mm, 56mm, 58mm, 60mm, 65mm, 70mm
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House of Ortho Tools

Plot No. G-2041/42/A, Kishan Gate, Lodhika G.I.D.C.,
Kalawad Road, Metoda, RAJKOT-360 021, (INDIA).

www.hardikinternational.com
info@hardikinternational.com

☎ : +91 97370 47470/1/2/4 S : [hardikinternational](https://www.hardikinternational.com)

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