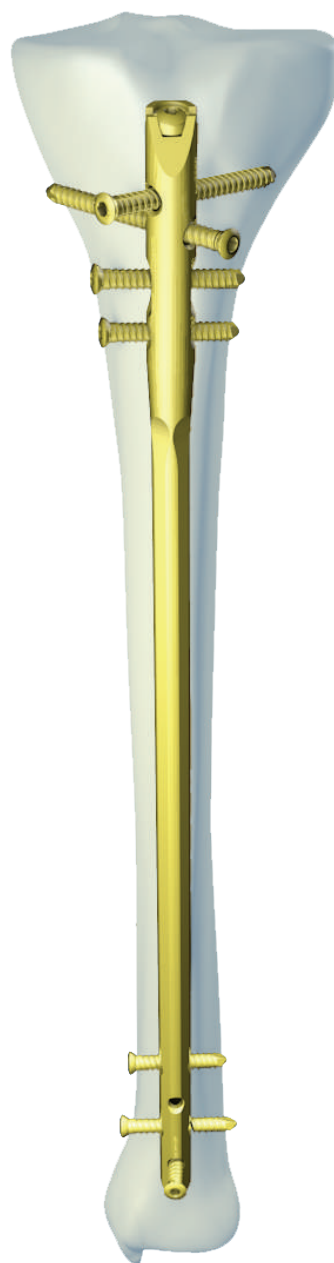


Tibia Nail System



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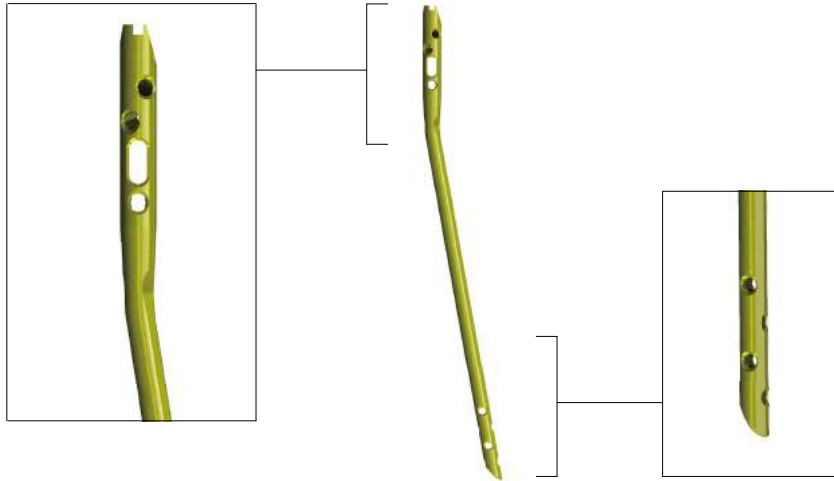
Ordering Information

Implant	11-12
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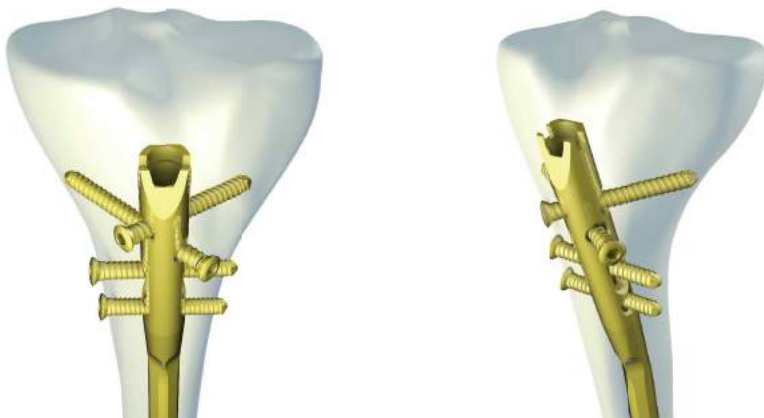
Product Feature

Additional proximal locking options

- Static locking and a controlled dynamization locking hole



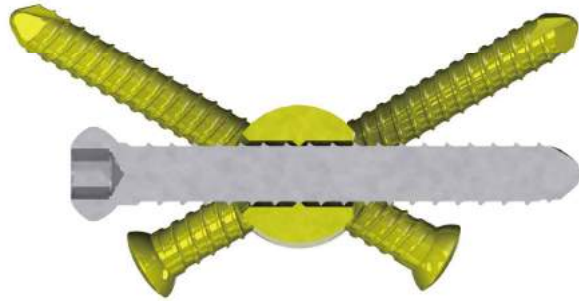
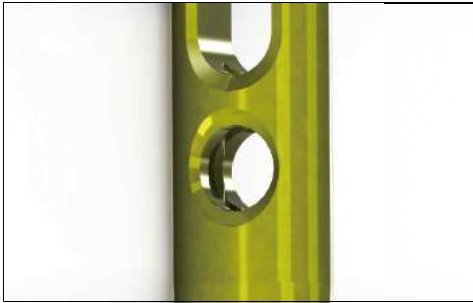
- Standard M/L screw locking and additional oblique screw locking



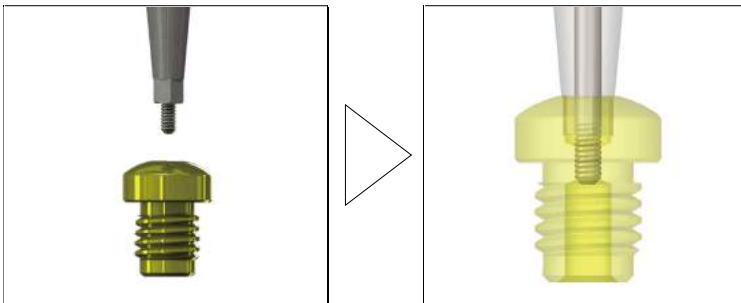
- Distal screw locking options (Two M/L screw locking hole, one A/P screw locking hole)



Advanced locking mechanism for increased rotational stability at distal proximal M/L screw hole



Self-retaining Endcap Driver - Ease of Insertion



Accommodating reamed or unreamed procedures - Cannulated nails (8mm dia. to 12mm dia.)

Anatomic bend for ease of nail insertion - 9° A/P slope

All implants are Titanium alloy for improved mechanical and fatigue properties

Screw locking Options (It can be decided by surgeon depends on fracture type.)



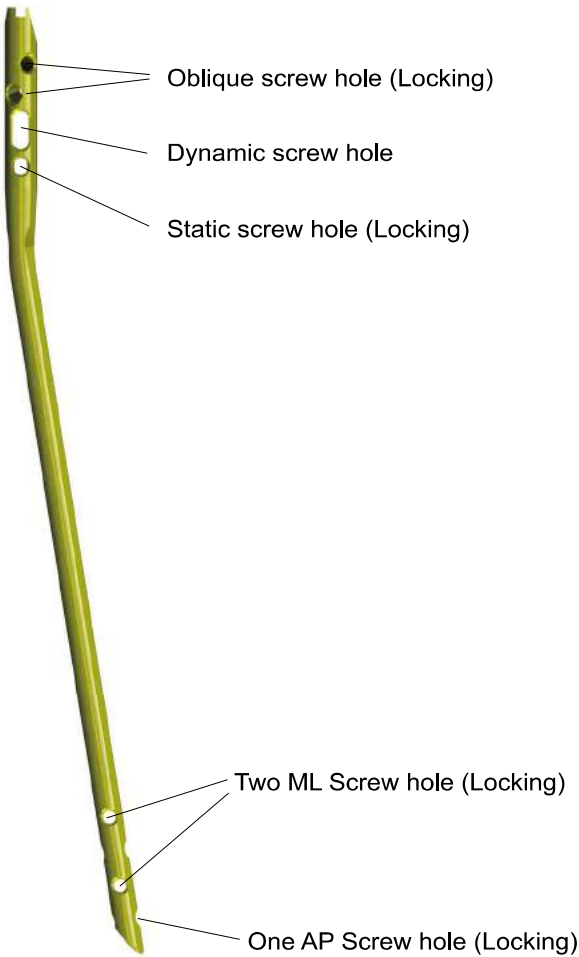
Indication

For the fractures of the proximal and distal third of the tibia, including the shaft, stable and unstable fractures, non-unions, for the prophylactic nailing of impending pathological fractures.

Product Specification

Cannulated Nail

Diameter	8mm to 12mm (1mm increments)
Length	Φ 8mm : 255mm to 315mm (15mm increments) Φ 9mm : 255mm to 330mm (15mm increments) Φ 10mm : 270mm to 330mm (15mm increments) Φ 11,12mm : 285mm to 345mm (15mm increments)



Screw

- 5.0mm Locking screw
 - Φ 8, 9mm proximal screw hole and Φ 10mm to Φ 12mm proximal and distal screw hole
 - Length 26mm to 80mm (2mm increments)
80mm to 90mm (5mm increments)
- 4.0mm Locking screw
 - Φ 8, 9mm only for distal screw hole
 - Length 24mm to 40mm (2mm increments)
45, 50mm



4.0mm Locking screw



5.0mm Locking screw

End Cap

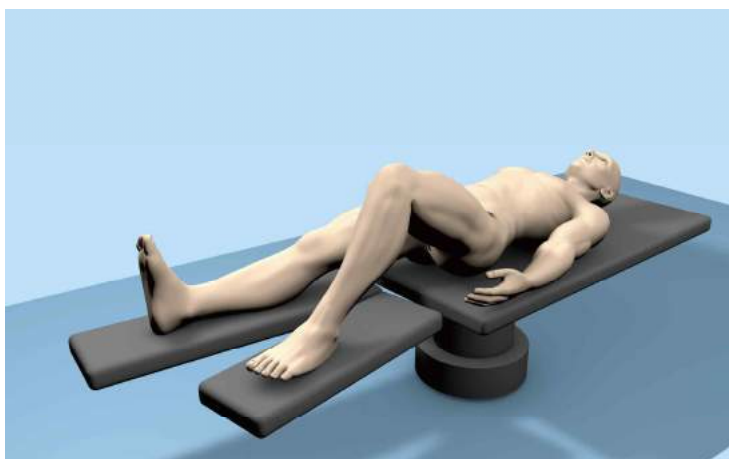
0mm, 5mm, 10mm Cap



Surgical Procedure

1. Patient Positioning

Position the patient supine on a radiolucent table with unaffected limb extended away from the affected limb. Optionally, a fracture table may be used with a pin inserted through the calcaneus to place the leg in traction. Flex the affected limb 80-90° and check for the length and rotation by comparison to the unaffected limb.

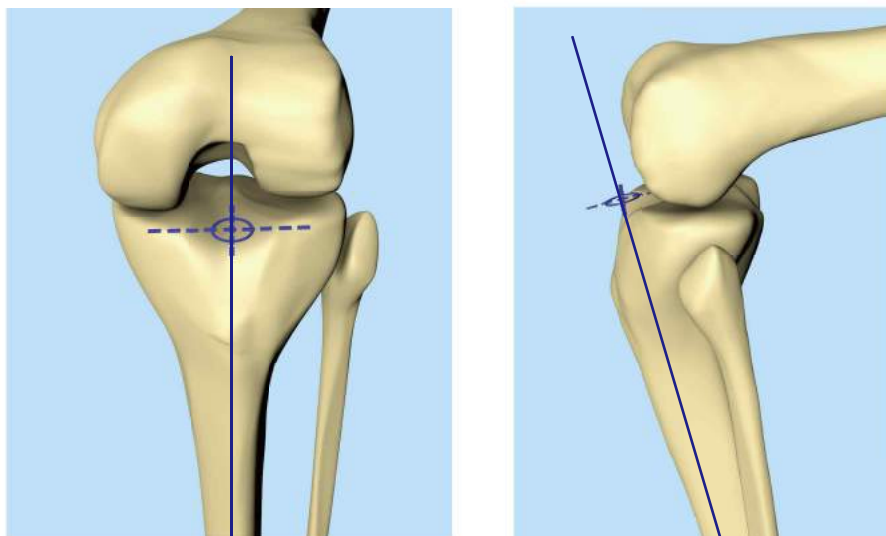


2. Approach

Make a 2cm incision in line with the intramedullary canal. The patellar tendon may be retracted laterally or medially.

3. Entry Point

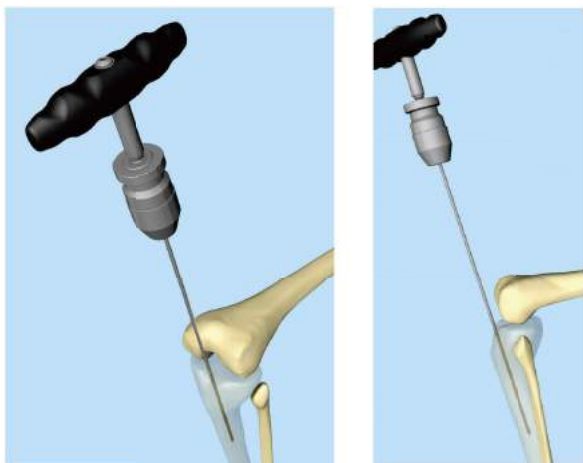
The medullary canal is opened through a superolateral plateau entry portal. The center point of the portal is located slightly medial to the lateral tibial spine as visualized on the A/P radiograph and immediately adjacent and anterior articular margin as visualized on the true lateral radiograph. It is located lateral to the midline of the tibia by an average of 6 percent of the tibial plateau width.



4. Guide Wire Placement

Attach the Guide Pin(910-03051) in the Universal Chuck with T-Handle(910-01026). Slightly punch mark the incision point at a 10° angle to the shaft axis in the lateral view. Hold a APIS Tibia interlocking Nail on the side of the lower leg its distal end parallel to the tibia shaft. The curved proximal nail end determines the definitive angle of insertion for Guide Pin.

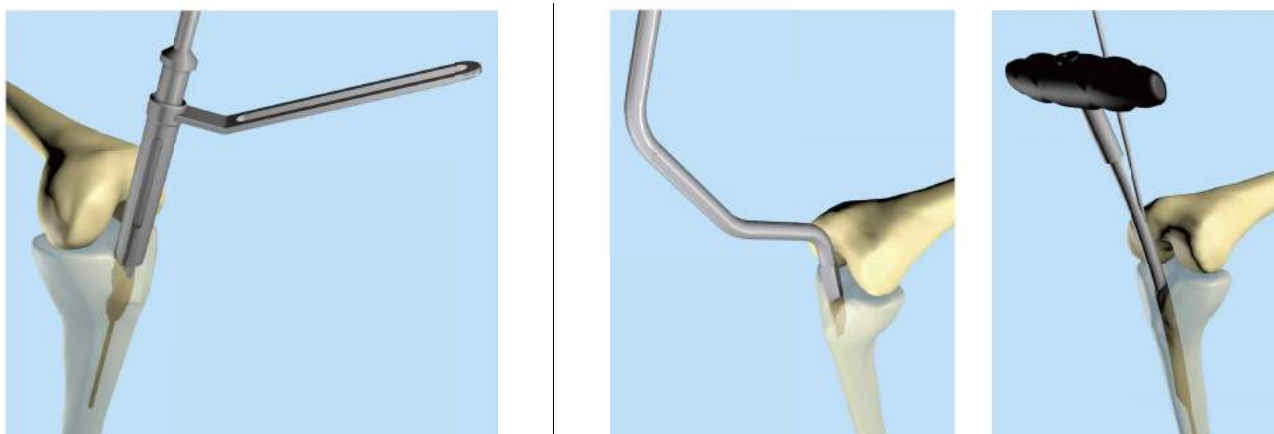
Insert Guide Pin for nearly 8-10cm and check the position under image intensification in the AP and lateral views.



5. Open Intramedullary Canal

Place the Protection Sleeve(910-01001) and the Drill Sleeve(910-01002) over the Guide Pin and down to the bone. Drill to a depth of nearly 8-10cm using the Open Reamer (910-01004). The Guide Pin and the Open Reamer should not touch the posterior cortex. Alternatively, to penetrate the cortex, Cannulated Curved AWL(910-01005) or Primary AWL for Tibia (910-01006).

Remove Guide Pin, Open Reamer and Protection Sleeve.

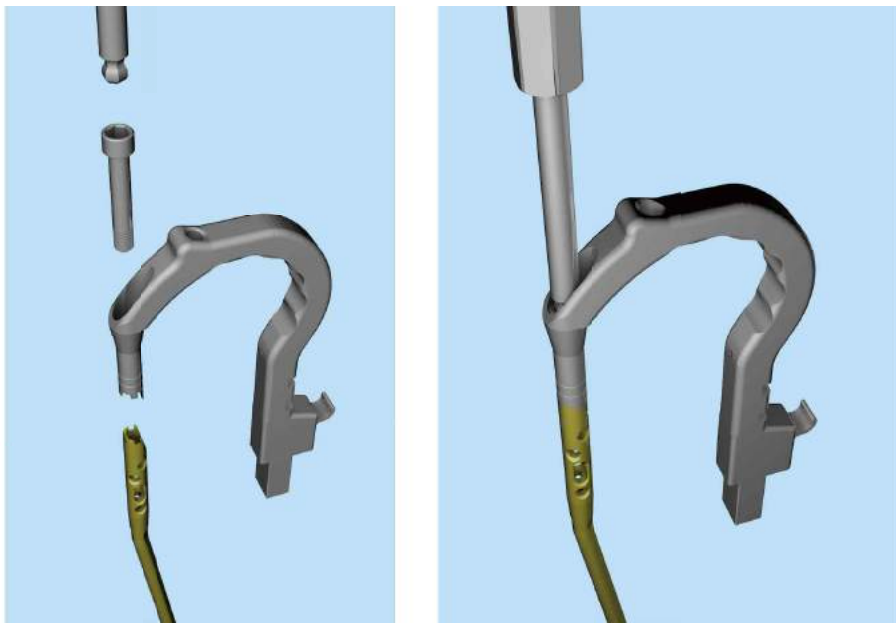


6. Reaming Medullary Canal

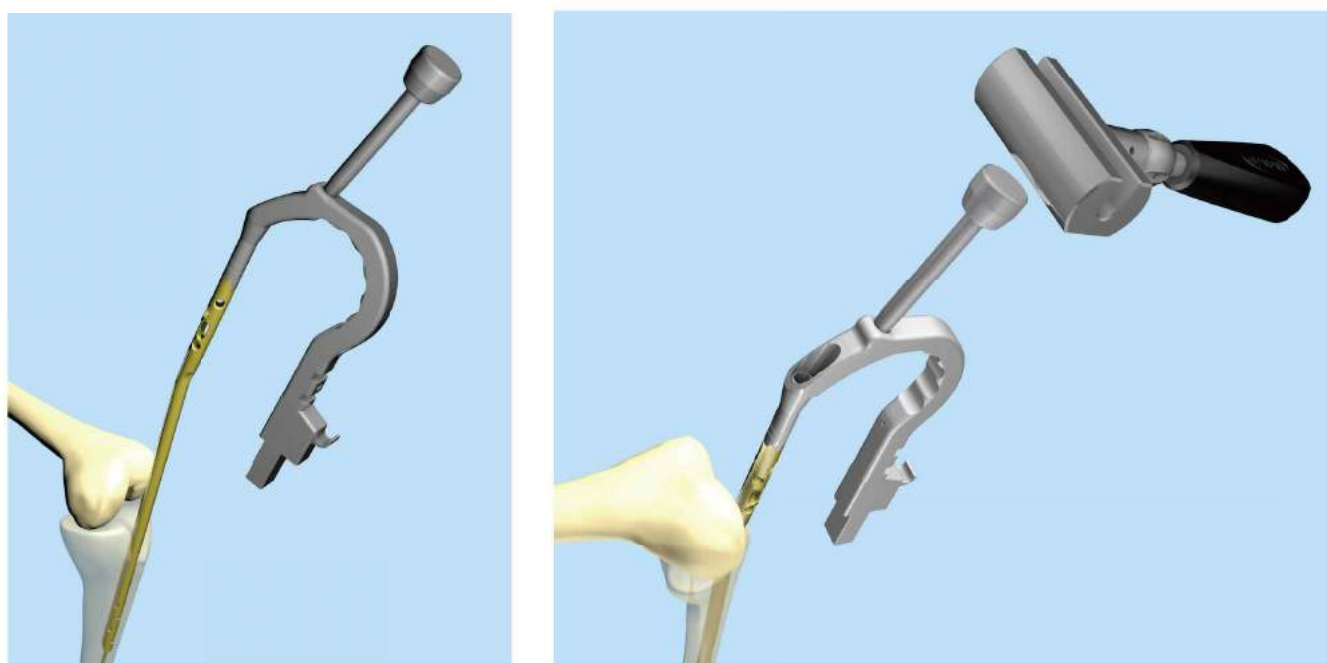
If necessary enlarge the tibia canal with the medullary reamer up to the desired diameter. First, Ball Tip Reaming Rod is inserted through the fracture site. Reaming is started in 1mm increment until cortical contact is confirmed. The reaming should be 1mm-1.5mm larger than the diameter of the nail to be used.

7. Nail Insertion

The Nail Measuring Plate(910-11005) may be used to determine nail diameter and length. The selected nail is assembled onto the Assemble Handle(910-01007); anteriorly, match the notch on the handle to the nail. Place the Assemble bolt(910-01008) into the Assemble Handle and thread it into the proximal nail end using the Assemble Bolt Driver(910-01021). Ensure the nail is oriented properly on the Assemble Handle, secure the assembly with the Assemble Bolt Driver.

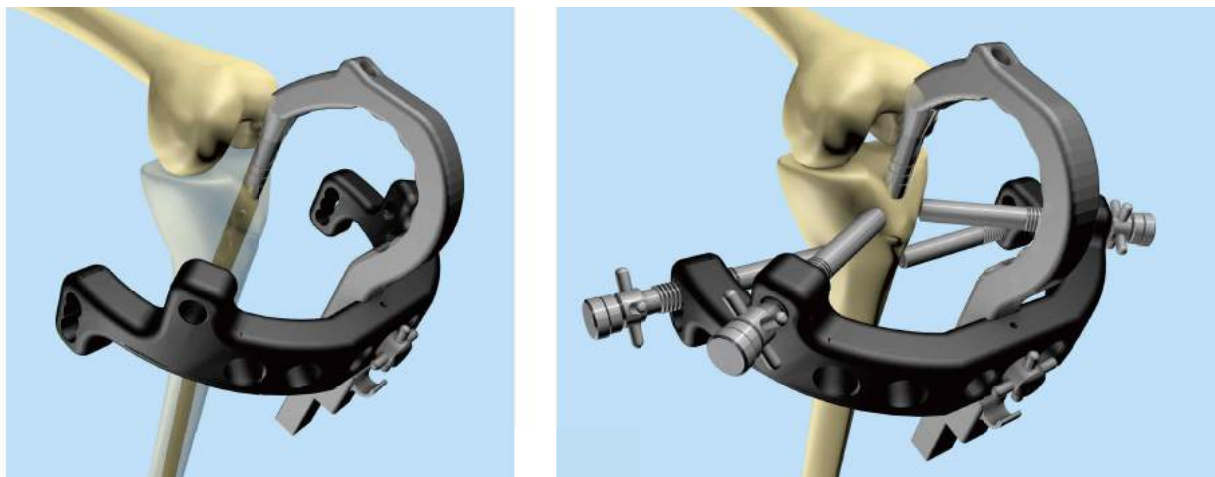


Insert the nail into intramedullary canal. Use a twisting motion to advance the nail. The monitor the nail passage across the fracture, the control in two planes to avoid misalignment. Insert the nail it is at or below the tibial opening. Check final nail position in AP and lateral views. Optionally, if needed, use controlled hammer blows to seat the nail.



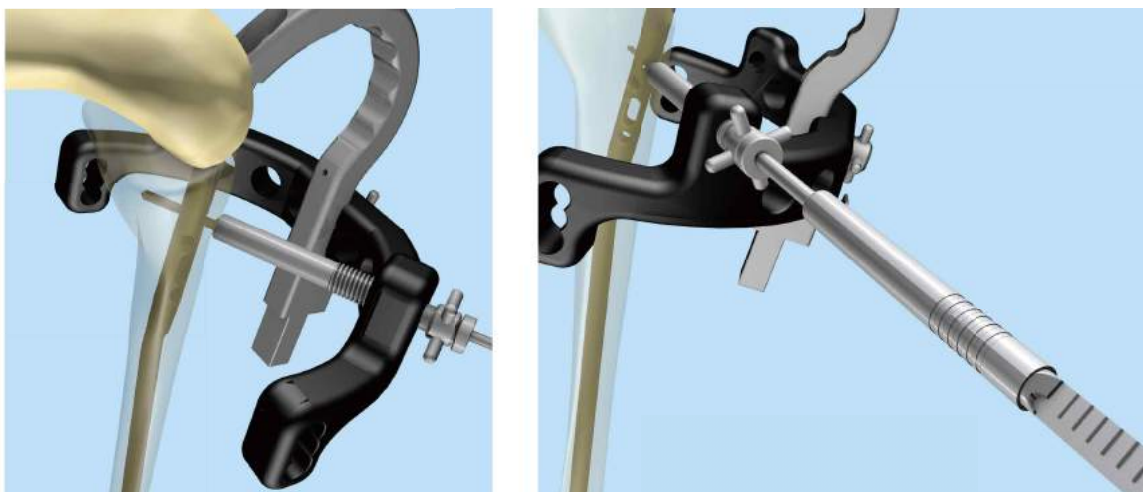
8. Mount the aiming arm and trocar combination

Confirm that the nail is securely connected to the Assemble Handle. Mount the Proximal Target Guide to the Assemble Handle. Insert three-part trocar combination. Protection Sleeve(910-01139), corresponding Drill Sleeve(910-01040) and Trocar(910-01041) through the desired ML hole in the aiming arm, make incision and insert the trocar to the bone, remove trocar.



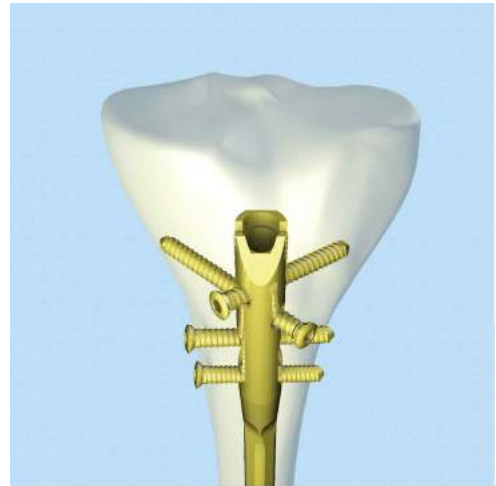
9. Drill and determine the locking screw length

Ensure that the Drill sleeve is pressed firmly to the near cortex. Using the corresponding drill bit. Drill through both cortices until the tip of the drill bit penetrates the far cortex. After drilling both cortices, remove the drill bit and the drill sleeve. Insert the depth gauge and check and decide the length of the locking screw.



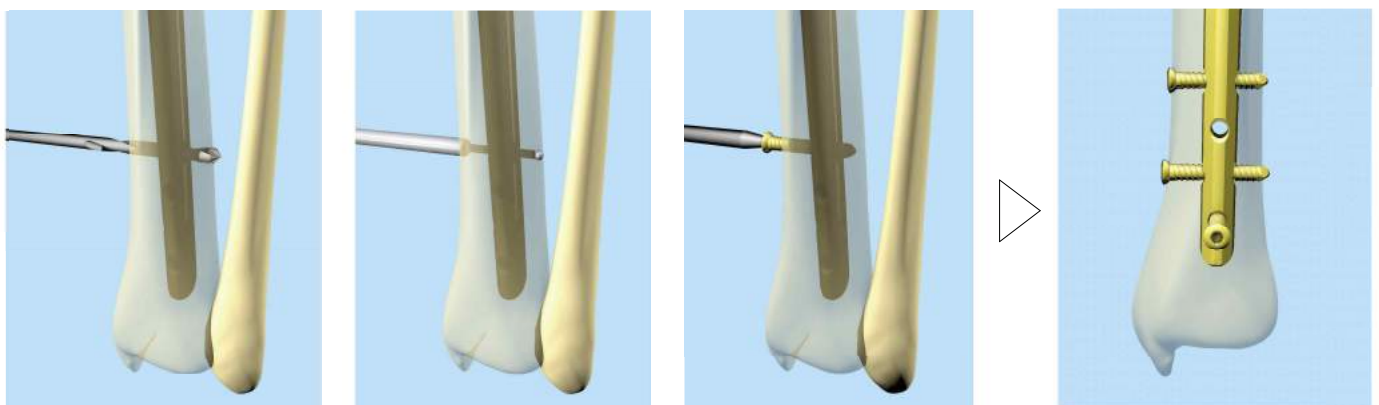
10. Screw Insertion

Insert the appropriate locking screw through the protection sleeve using screw driver. Ensure locking screw length under image intensification. The tip of the locking screw should not project more than 1-2mm beyond the far cortex. Depending on fracture type and surgeon's decision, the screw insertion option can be decided and inserted.



11. Free Distal Locking

Use the appropriate locking screws and drill bit for the nail diameter selected it is recommended to lock distally first. Confirm the nail has been inserted to the appropriate depth. Locking of the tibial nail is usually performed from the medial side, if possible with the leg extended. This position helps counteract the forces exerted by the quadriceps muscle that would tend to deform the proximal fragment and also facilitates rotational control of the tibia axis before locking.

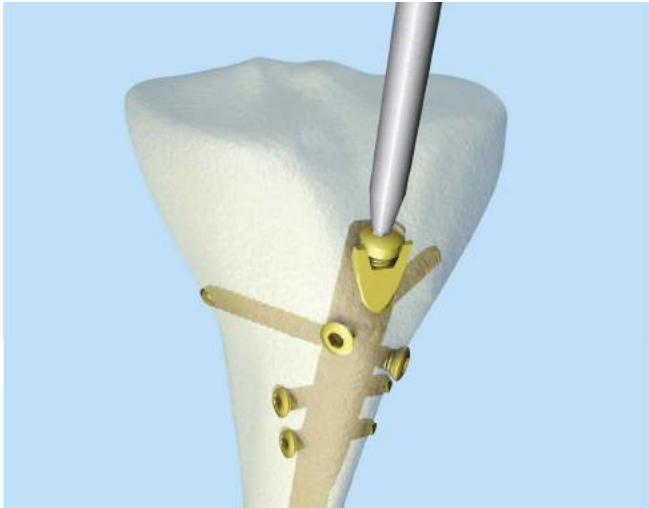


Also distal screw insertion option can be decided on the fracture type and surgeon's decision.

12. Insertion of End Cap

The end caps for the APIS Tibia Nails are available in extension lengths of 0mm, 5mm, 10mm. The purpose of end caps; prevent the bone ingrowth, extend nail height.

Remove the nail insertion instruments. To help end cap insertion, remove the Assemble Bolt only. The Assemble handle can remain to help align the end cap to the top of the nail. The end cap fits through the barrel of the Assemble handle. Assemble the end cap with the screw driver and lock the end cap with the end cap driver. Turn the end cap clockwise to thread end into the nail.



13. Implant Removal

Implant removal is an optional step. Clear any tissue ingrowth in the cockpit of the end cap. Remove the end cap with the screw driver. Remove all locking screw except one of the proximal locking screws using the screw driver. Assemble/extract Rod is connected into nail and remove the proximal locking screw. Extract the nail by applying gentle blows with slotted hammer.



Ordering Information - Implants

Nail (* : Optional Items)

Cat No.	Description	Size	Cat No.	Description	Size
502-08255	Tibia Nail	Φ8 x 255mm	502-11270	Tibia Nail	Φ11 x 270mm
502-08270	Tibia Nail	Φ8 x 270mm	502-11285	Tibia Nail	Φ11 x 285mm
502-08285	Tibia Nail	Φ8 x 285mm	502-11300	Tibia Nail	Φ11 x 300mm
502-08300	Tibia Nail	Φ8 x 300mm	502-11315	Tibia Nail	Φ11 x 315mm
502-08315	Tibia Nail	Φ8 x 315mm	502-11330	Tibia Nail	Φ11 x 330mm
502-08330	Tibia Nail	Φ8 x 330mm	502-11345	Tibia Nail	Φ11 x 345mm
502-08345	Tibia Nail	Φ8 x 345mm	502-11360	Tibia Nail	Φ11 x 360mm
* 502-08360	Tibia Nail	Φ8 x 360mm	* 502-11375	Tibia Nail	Φ11 x 375mm
502-09255	Tibia Nail	Φ9 x 255mm	502-12270	Tibia Nail	Φ12 x 270mm
502-09270	Tibia Nail	Φ9 x 270mm	502-12285	Tibia Nail	Φ12 x 285mm
502-09285	Tibia Nail	Φ9 x 285mm	502-12300	Tibia Nail	Φ12 x 300mm
502-09300	Tibia Nail	Φ9 x 300mm	502-12315	Tibia Nail	Φ12 x 315mm
502-09315	Tibia Nail	Φ9 x 315mm	502-12330	Tibia Nail	Φ12 x 330mm
502-09330	Tibia Nail	Φ9 x 330mm	502-12345	Tibia Nail	Φ12 x 345mm
502-09345	Tibia Nail	Φ9 x 345mm	502-12360	Tibia Nail	Φ12 x 360mm
* 502-09360	Tibia Nail	Φ9 x 360mm	* 502-12375	Tibia Nail	Φ12 x 375mm
502-10270	Tibia Nail	Φ10 x 270mm	502-13270	Tibia Nail	Φ13 x 270mm
502-10285	Tibia Nail	Φ10 x 285mm	502-13285	Tibia Nail	Φ13 x 285mm
502-10300	Tibia Nail	Φ10 x 300mm	502-13300	Tibia Nail	Φ13 x 300mm
502-10315	Tibia Nail	Φ10 x 315mm	502-13315	Tibia Nail	Φ13 x 315mm
502-10330	Tibia Nail	Φ10 x 330mm	502-13330	Tibia Nail	Φ13 x 330mm
502-10345	Tibia Nail	Φ10 x 345mm	502-13345	Tibia Nail	Φ13 x 345mm
502-10360	Tibia Nail	Φ10 x 360mm	502-13360	Tibia Nail	Φ13 x 360mm
* 502-10375	Tibia Nail	Φ10 x 375mm	* 502-13375	Tibia Nail	Φ13 x 375mm



End Cap

Cat No.	Description	Size
530-00000	End Cap for Tibia	0mm
530-00005	End Cap for Tibia	5mm
530-00010	End Cap for Tibia	10mm



Nail Locking Screw, $\Phi 4.0\text{mm}$

Cat No.	Description	Size
520-24124	Nail Locking Screw, $\Phi 4.0\text{mm}$	24 mm
520-24126	Nail Locking Screw, $\Phi 4.0\text{mm}$	26 mm
520-24128	Nail Locking Screw, $\Phi 4.0\text{mm}$	28 mm
520-24130	Nail Locking Screw, $\Phi 4.0\text{mm}$	30 mm
520-24132	Nail Locking Screw, $\Phi 4.0\text{mm}$	32 mm
520-24134	Nail Locking Screw, $\Phi 4.0\text{mm}$	34 mm
520-24136	Nail Locking Screw, $\Phi 4.0\text{mm}$	36 mm
520-24138	Nail Locking Screw, $\Phi 4.0\text{mm}$	38 mm
520-24140	Nail Locking Screw, $\Phi 4.0\text{mm}$	40 mm
520-24144	Nail Locking Screw, $\Phi 4.0\text{mm}$	44 mm
520-24148	Nail Locking Screw, $\Phi 4.0\text{mm}$	48 mm



Nail Locking Screw, $\Phi 5.0\text{mm}$

Cat No.	Description	Size
520-25026	Nail Locking Screw, $\Phi 5.0\text{mm}$	26 mm
520-25028	Nail Locking Screw, $\Phi 5.0\text{mm}$	28 mm
520-25030	Nail Locking Screw, $\Phi 5.0\text{mm}$	30 mm
520-25032	Nail Locking Screw, $\Phi 5.0\text{mm}$	32 mm
520-25034	Nail Locking Screw, $\Phi 5.0\text{mm}$	34 mm
520-25036	Nail Locking Screw, $\Phi 5.0\text{mm}$	36 mm
520-25038	Nail Locking Screw, $\Phi 5.0\text{mm}$	38 mm
520-25040	Nail Locking Screw, $\Phi 5.0\text{mm}$	40 mm
520-25042	Nail Locking Screw, $\Phi 5.0\text{mm}$	42 mm
520-25044	Nail Locking Screw, $\Phi 5.0\text{mm}$	44 mm
520-25046	Nail Locking Screw, $\Phi 5.0\text{mm}$	46 mm
520-25048	Nail Locking Screw, $\Phi 5.0\text{mm}$	48 mm
520-25050	Nail Locking Screw, $\Phi 5.0\text{mm}$	50 mm
520-25052	Nail Locking Screw, $\Phi 5.0\text{mm}$	52 mm
520-25054	Nail Locking Screw, $\Phi 5.0\text{mm}$	54 mm
520-25056	Nail Locking Screw, $\Phi 5.0\text{mm}$	56 mm
520-25058	Nail Locking Screw, $\Phi 5.0\text{mm}$	58 mm
520-25060	Nail Locking Screw, $\Phi 5.0\text{mm}$	60 mm
520-25062	Nail Locking Screw, $\Phi 5.0\text{mm}$	62 mm
520-25064	Nail Locking Screw, $\Phi 5.0\text{mm}$	64 mm
520-25066	Nail Locking Screw, $\Phi 5.0\text{mm}$	66 mm
520-25068	Nail Locking Screw, $\Phi 5.0\text{mm}$	68 mm
520-25070	Nail Locking Screw, $\Phi 5.0\text{mm}$	70 mm
520-25072	Nail Locking Screw, $\Phi 5.0\text{mm}$	72 mm
520-25074	Nail Locking Screw, $\Phi 5.0\text{mm}$	74 mm
520-25076	Nail Locking Screw, $\Phi 5.0\text{mm}$	76 mm
520-25078	Nail Locking Screw, $\Phi 5.0\text{mm}$	78 mm
520-25080	Nail Locking Screw, $\Phi 5.0\text{mm}$	80 mm
520-25085	Nail Locking Screw, $\Phi 5.0\text{mm}$	85 mm
520-25090	Nail Locking Screw, $\Phi 5.0\text{mm}$	90 mm



Ordering Information - Instruments

910-03001 Guide Pin (Φ3.0x350mm)

910-01026 Universal Chuck with T-handle

910-01105 Cannulated Curved Awl

910-01006 Primary Awl for Tibia

910-01001 Protection Sleeve

910-01002 Drill Sleeve for Guide Pin

910-01003 Trocar



910-01104 Open Reamer

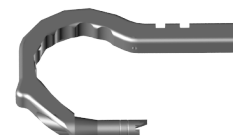
910-01007 Assemble Handle for Tibia

910-01008 Assemble Bolt

910-01009 Proximal Target Guide for Tibia

910-01219 Impact Handle

910-01021 Assemble Bolt Driver (L-Ball)



Tibia Nail System

910-01038 Assemble Bolt Driver (T-Ball)



910-01039 Protection Sleeve 100mm (Non-holding)

910-01139 Protection Sleeve 100mm (Holding)

910-01040 Drill Sleeve

910-01041 Trocar



901-01435 Drill Bit Ø3.5mm (Length: 160mm)

901-01143 Drill Bit Ø4.3mm (Length: 280mm)

901-01343 Drill Bit Ø4.3mm (Length: 180mm)



910-03025 Depth Gauge for Nail Locking Screw



910-03126 Screw Driver, Holding (3.5mm)



910-05425 Screw Driver, Holding (2.5mm)

910-04115 Screw Driver, Holding (2.5mm /Long)



910-01020 Extract Bolt



910-01120 Extract Bolt with Tip



910-03030 Assemble/Extrat Rod



910-03029 Slotted Mallet

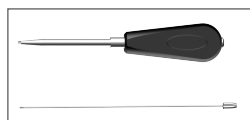


910-03060 Wrench



910-01048 End Cap Driver

910-01049 Coupling Screw For End Cap Driver



910-02050 Free Hand Drill Guide

910-02051 Free Hand Drill Sleeve 3.5

910-02052 Free Hand Drill Sleeve 4.3



910-03226 Screw Driver Shaft, Holding (3.5mm/Small Chuck)

910-04119 Screw Driver Shaft, Holding (2.5mm/Small Chuck)



910-01435 Drill Bit ($\Phi 3.5 \times 160 \text{mm}$)

910-01443 Drill Bit ($\Phi 4.3 \times 280 \text{mm}$)

910-01343 Drill Bit ($\Phi 4.3 \times 180 \text{mm}$)



910-90008 Container for Tibia Nail

Instrument (*:Optional Items)

901-30135 Pointed Drill Bit, AO Chuck ($\Phi 3.5 \times 160 \text{mm}$)

901-30343 Pointed Drill Bit, AO Chuck ($\Phi 4.3 \times 160 \text{mm}$)



901-30543 Pointed Drill Bit, AO Chuck ($\Phi 4.3 \times 280 \text{mm}$)

904-40012 Cannulated Quick Chuck Small



901-10243 Double Drill Sleeve ($\Phi 4.3/3.5 \text{mm}$)

No Image

Reamer System-Tibia Nail

910-11102 Reaming Rod, Straight Tip



910-11103 Reaming Rod, Ball Tip



910-10128 Start Reamer, Short



910-10001 Flexible Reamer Shaft, Short



910-10080 Reamer Tip (8.0mm)

910-10085 Reamer Tip (8.5mm)

910-10090 Reamer Tip (9.0mm)

910-10095 Reamer Tip (9.5mm)

910-10100 Reamer Tip (10.0mm)

910-10105 Reamer Tip (10.5mm)

910-10110 Reamer Tip (11.0mm)

910-10115 Reamer Tip (11.5mm)

910-10120 Reamer Tip (12.0mm)

910-10125 Reamer Tip (12.5mm)

910-10130 Reamer Tip (13.0mm)

910-10135 Reamer Tip (13.5mm)

910-10140 Reamer Tip (14.0mm)



904-50012 Quich Chuck



910-10009 Rod Pusher



910-10010 Reduction Guide



910-11005 Nail Measuring Plate



910-11004 Alignment Tube



910-90010 Container for Flexible Reamer



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