Surgical Technique

smith&nephew

TRIGEN® META-NAIL®

Semi-extended Instrument Set

TRIGEN◇ META-NAIL◇ Semi-extended Instrument Set Surgical Technique

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Nota Bene

The technique description herein is made available to the healthcare professional to illustrate the authors' suggested treatment for the uncomplicated procedure. In the final analysis, the preferred treatment is that which addresses the needs of the patient.

The technique is based on the tibial nailing approach outlined in the article below:
Tornetta P, 3rd, Collins E. Semiextended position of intramedullary nailing of the proximal tibia. *Clin Orthop Relat Res.* 1996: Number 328, pp 185-189.

Indications

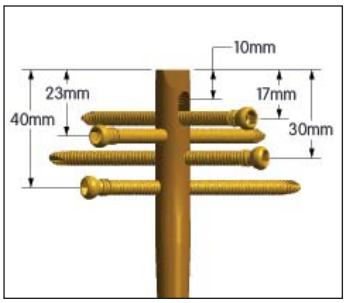
The TRIGEN® META-NAIL® Tibial Nail is indicated for fractures of the proximal and distal third of the tibia, including the shaft, stable and unstable factures, non-unions, mal-unions and for the prophylactic nailing of impending pathological factures.

Note This technique deals with the joint space around the knee. Caution must be taken at all times during the procedure. The Entry Tube is needed for guide pin placement, reaming, measuring, fracture reduction, and insertion of the guide rod. Please be aware there is a possibility of damaging the posterior aspect of the patella and the surrounding tendons if care is not taken.

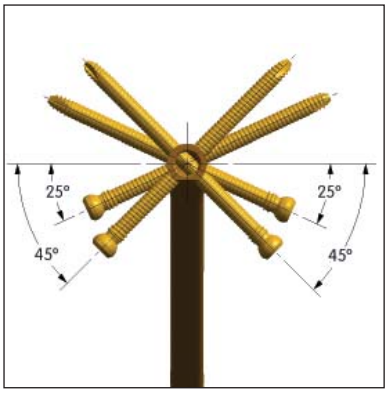
The TRIGEN META-NAIL Semi-extended Instrument Set has been designed with these concerns in mind.

TRIGEN® META-NAIL® Tibial Nail Specifications

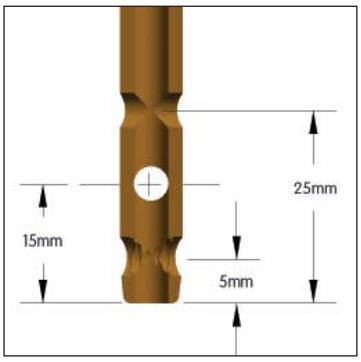
ML view



Distal end of nail (all knee and distal tibial)



Top view of nail



Non-driving end of nail (AP view)

Note These views are not to scale and should be used as a pictorial representation only.

Specifications	TRIGEN META-NAIL Tibia (8.5mm)	TRIGEN META-NAIL Tibia
Material	TI6AL4V	TI6AL4V
Diameter	8.5mm	10, 11.5 & 13mm
Lengths	16-50cm*	16-50cm*
Nail color	Grey	gold
Cross section	Round	Round
Proximal diameter (driving end)	12mm	12mm (10, 11.5 dia.) 13mm (13 dia.)
Distal diameter (non-driving end)	8.5mm	10, 11.5 & 13mm
Smallest thru diameter	4.8mm	5.0mm
Wall thickness	1.9mm	2.3mm (10) 3.0mm (11.5) 2.3mm (13)
Guide bolt thread	5/16-24 UNF	5/16-24 UNF
Screw diameter	4.5mm	5.0mm
Screw color	Grey	gold
Major diameter	4.5mm	5.0mm
Minor diameter (core)	4.0mm	4.3mm
Screw lengths	25-65mm	25-110mm
Hex size	4.7mm	4.7mm
Alternative Hex Drivers	RT Femoral & Recon 7.0mm Cannulated Screw PERI-LOC® Locking Screw	RT Femoral & Recon 7.0mm Cannulated Screw PERI-LOC 4.7mm Hex Driver, PROFIX® 4.7mm Hex Driver
Alternative modes	No	No
Proximal Locking (Driving End)		
Static lock locations/orientations	17mm/45° Screw Locked w/META-NAIL Cap 23mm/45° Threaded w/bushing 30mm/25° Threaded 40mm/25° Threaded	
Static Locking Hole Dimensions	Threaded 4.3mm minor dia. Threaded 4.7mm major dia.	Threaded 4.5mm minor dia. Threaded 5.3mm major dia.
Compression/Dynamic Slot Location	10mm	10mm
Compression/Dynamic Slot Diameter/Length	4.7mm/7mm	5.3mm/7mm
Degree of Proximal Bend (Herzog)	10°	10°
Proximal Bend Location	27mm	27mm
Distal Locking (Non-driving End)		
Static Lock Locations/ Orientations	25mm/ML 15mm/AP 5mm/ML (Threaded)	25mm/ML 15mm/AP 5mm/ML (Threaded)
Static Locking Hole Dimensions	4.7mm**	5.3mm**
Degree of Distal Bend	2°	2°
Distal Bend Location	60mm	60mm

*Set does not include all sizes; Outlier sizes may be special order only
**Most distal hole threaded

Instruments for opening the proximal tibia

3.2mm Tip Threaded Guide Wire
Cat. No. 7163-1690

12.5mm Entry Reamer
Cat. No. 7163-1116

Entry Portal Handle
Cat. No. 7167-4092

3.2mm T-Handle Trocar
Cat. No. 7167-4074

Cannulated Awl
Cat. No. 7167-4000

Semi-extended Honeycomb
Cat. No. 7165-4533

T-Handle
Cat. No. 7167-4076

Mini Connector
Cat. No. 7163-1186

Semi-extended Guide Pin Sleeve
Cat. No. 7165-4527

Semi-extended Entry Tube
Cat. No. 7165-4526

Surgical Technique

Patient positioning

Position the patient supine on a radiolucent table with the unaffected limb extended away from the affected limb.

There should be approximately 10–20° of flexion.

Assemble the Entry Tube to the Entry Portal Handle by pulling back the black trigger of the Entry Portal handle and inserting the Entry Tube into the handle ring.

Turn the tube until it clicks into a locked position.

Next, place the Guide Pin Sleeve through the tube until it locks into both the end of the sleeve and Entry Portal Handle ring.

Note Take time to inspect the Entry Tube as it can become damaged, bent or chipped with excessive prior reaming and insertion of other instruments. Any flaws in the tube can lead to damage of the surrounding tendons and tissues.

Incision and entry point: Lateral subluxation of the patella

A midline skin incision is made from the upper pole of the patella to the middle of the patella approximately 1.5 inches in length.

A second deep incision is made medial to the patella, cutting the superior two-thirds of the medial retinaculum leaving the cuff intact.

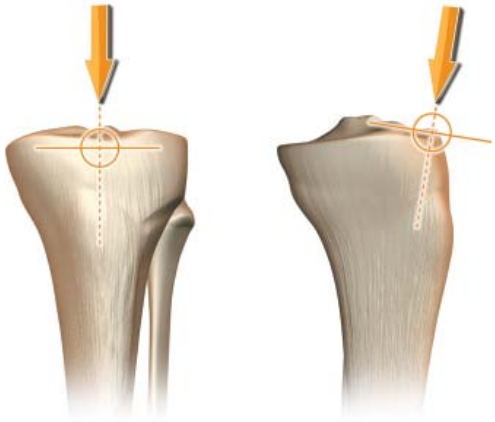
Extend the incision 1-2 cm into the quadriceps tendon. This incision is not midline, but through the medial one-third of the quadriceps tendon as outlined in the image.

Sublux the patella laterally and pass the fully assembled entry tube through the skin incision until it is sitting on the tibia plateau.

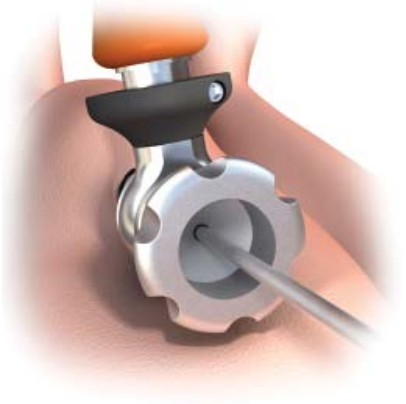
Entry portal

Use the femoral condyles as a guide for proper tube placement making sure the Guide Pin Sleeve sits properly as outlined below.

The entry point is located just medial to the lateral tibia eminence in the A/P view and inline with the anterior cortex and intramedullary canal in the lateral view.



Attach the 3.2mm Tip Threaded Guide Wire (7163-1690) to the drill via the Mini Connector (7163-1186) and insert into the Guide Pin Sleeve.



NOTE: The Semiextended Honeycomb may be used if initial guide wire placement is suboptimal. To obtain desired guide wire placement, remove the Semiextended Guide Pin Sleeve and insert the Semiextended Honeycomb through the Entry Tube over the guide wire. Rotate the Semiextended Honeycomb within the Entry Tube to the desired location and insert another 3.2mm guide wire.

Entry portal

After definitive guide wire placement remove the Guide Pin Sleeve and carefully slide the Entry Tube down and onto the tibia plateau.

Attach the 12.5mm Entry Reamer (7163-1116) to power. Advance over the guide wire through the Entry Tube to a depth of 4–6cm in the tibia. Maintain alignment so as to avoid penetration of the posterior cortex.

Check position via radiographic imaging and then remove the 12.5mm Entry Reamer and 3.2mm Tip Threaded Guide Wire.

Alternative technique: Entry portal

With the Entry Tube and Entry Portal Handle still in the joint space, attach the T-Handle (7167-4076) to the Cannulated Awl (7167-4000) and insert into the proximal tibia to a depth of 4–6cm. Introduce the 3.2mm T-Handle Trocar (7167-4074) into the back of the assembly prior to insertion in order to prevent awl slippage and accumulation of cortical bone within the cannulation.

T-Handle
Cat. No. 7167-4076

Entry Portal Handle
Cat. No. 7167-4092

Entry Tube
Cat. No. 7165-4526

3.2mm T-Handle Trocar
Cat. No. 7167-4074

Cannulated Awl
Cat. No. 7167-4000

Instruments for fracture reduction and reaming

Entry Tube
Cat. No. 7165-4526

Entry Portal Handle
Cat. No. 7167-4092

Gripper
Cat. No. 7167-4080

Ruler
Cat. No. 7167-4079

T-Handle
Cat. No. 7167-4076

Obturator
Cat. No. 7167-4078

Flexible Reamer Shaft
Cat. No. 7111-8200

Reamer Heads
Cat. No. 7111-8231–8246

Reducer
Cat. No. 7167-4077

3.0mm x 1000mm Ball Tip Guide Rod
Cat. No. 7163-1626

Fracture reduction

Insert the back end of the 3.0mm Ball Tip Guide (7163-1626) into the front of the Gripper (7167-4080) and gently close the trigger-grip.

Connect the Reducer and Reducer Connector (7167-4077) so that the words “Slot Orientation” are in line with the opening at the tip. Complete the assembly by connecting it to the T-Handle.

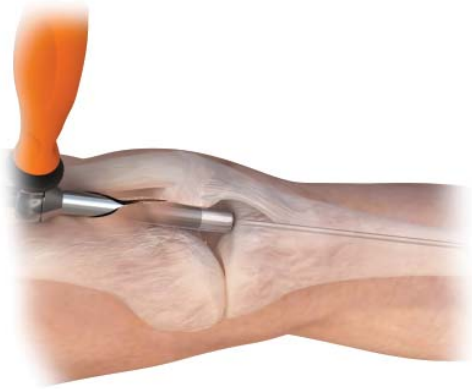
Advance the Reducer into the intramedullary canal and use the curved tip to direct the 3.0mm Ball Tip Guide Rod past the fracture into the region of the distal epiphyseal scar. The guide rod should be center-center in the AP and lateral views.

Reducer removal

Once the guide rod is at the desired depth, detach the Gripper and remove the Reducer from the tibial canal. Slide the Obturator (7167-4078) into the back of the T-Handle during extraction in order to maintain guide rod position within the canal.

Implant measurement

After Reducer removal, re-confirm guide rod placement within the distal tibia and slide the Ruler (7167- 4079) over the guide rod, inside the Entry Tube, to the desired depth. The metal tip of the Ruler denotes the driving end of the nail.



Confirm guide rod position in the window at the opposite end of the Ruler as shown in order to ensure accurate implant measurement. Push down on the top of the Ruler until contact is made with the 3.0mm Ball Tip Guide Rod. Implant length is read from the exposed calibrations at the end of the Ruler.

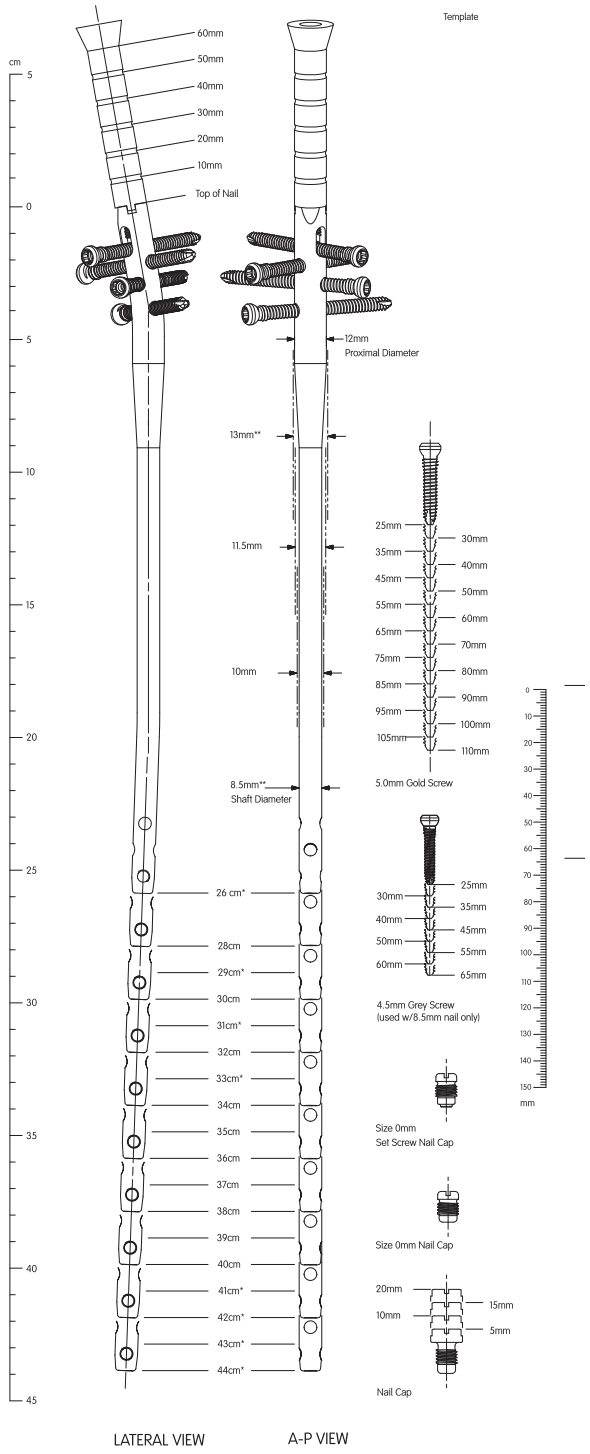
Note Confirm fracture reduction so as not to underestimate correct implant length. Reference the fibula for accurate fracture distraction or compression.

Note Confirm that the Ruler opens easily. Adjust the thumb-wheel connection at the end to allow for free movement.

Unreamed technique

Radiographic templating is used to determine nail size. The appropriate diameter implant will provide translational till within the isthmus of the intramedullary canal. Generally, selection of a nail approximately 1–1.5mm less than the narrowest canal measurement on the lateral radiograph assists in avoiding implant incarceration during insertion.

Note The 8.5mm diameter of the Reducer provides an initial “sound” for determining canal width in small diameter tibias.



TRIGEN° META-NAIL° Tibial Nail Radiographic Template
Cat. No. 7118-0810

Reamed technique

Radiographic templating and intra-operative measurement will determine nail size. Beginning with the 9.0mm End Cutting Reamer Head (7111-8231) and Flexible Reamer Shaft (7111-8200), ream the intramedullary canal sequentially in half millimeter increments to a size 1-1.5mm larger than the selected nail size.

Ensure Guide Rod placement during reaming by inserting the Obturator into the back of the Reamer unit during retraction. Continue to confirm Guide Rod placement in the distal tibia throughout reaming. Periodically move the reamer back and forth in the canal to clear debris from the cutting flutes.

Instruments for nail assembly and insertion

META-NAIL° Anterior Drop
Cat. No. 7165-4501

Guide Bolt Wrench
Cat. No. 7163-1140

9.0mm Drill Sleeve
Cat. No. 7163-1152

4.0mm Drill Sleeve
Cat. No. 7167-4083

4.0mm Long Pilot Drill
Cat. No. 7163-1110

Short Impactor
Cat. No. 7165-4521

T-Handle
Cat. No. 7167-4076

Semi-extended Drill Guide
Cat. No. 7165-4524

Semi-extended Guide Bolt
Cat. No. 7165-4525

Impactor
Cat. No. 7167-4081

Slotted Hammer
Cat. No. 7167-4082

Nail assembly

Attach the META-NAIL® drill guide to the nail with the Guide Bolt Long and tighten with the Guide Bolt Wrench and T-Handle. The nail is correctly aligned when:

1 The line on the insertion barrel matches the line of the nail

2 The “A” on the nail matches the line “A” on the insertion barrel

3 The apex of the nail’s proximal Herzog Bend faces posterior and the drill guide is oriented anterior

The bevel on the front of the nail marks the connection to the drill guide and can be seen in the lateral view as a means for determining proximal insertion depth.

Attach the Anterior Drop (7165-4501) to the drill guide and verify targeting accuracy by inserting a gold 9.0mm Drill Sleeve (7163-1152) and silver 4.0mm Drill Sleeve (7167-4083) into the drop and passing a 4.0mm Long Pilot Drill (7163-1110)* through the assembly. An incorrectly attached nail will not target.

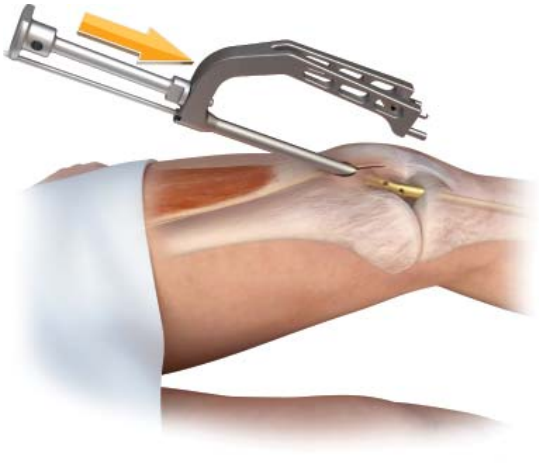
Nail insertion

Remove Entry Tube and Handle.

Remove the Anterior Drop and attach the Impactor (7167-4081) to the drill guide. Orient the drill guide assembly in the AP position and advance the nail over the guide rod by light blows from the Slotted Hammer (7167-4082) to the desired depth.

Additional reaming of the intramedullary canal may be indicated if excessive force is required to insert the nail.

Verify fracture reduction as the nail crosses the fracture site by paying close attention to rotation, length, alignment, distraction and/or shortening. Check final nail position in both the AP and lateral views for correct alignment.



* 4.0mm Long Pilot Drill (7163-1110) is interchangeable with 4.0mm AO Long Drill (7163-1121)

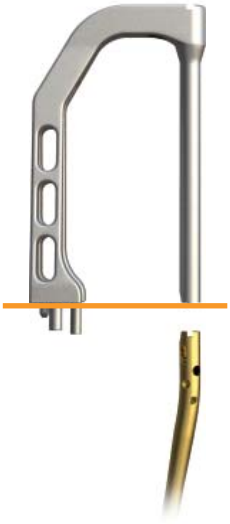
Check nail depth

Proximal

In the lateral view, confirm nail position by observing the notch present at the nail/drill guide junction. If compression or dynamic locking is desired, it is recommended to countersink the nail approximately 10mm to avoid implant prominence.

Distal

NoteTip



Instruments for standard, dynamic and compression locking

Screw Length Sleeve
Cat. No. 7167-4085

Nail Cap Set Screw
Cat. No. 7165-6000

META-NAIL° Anterior Drop
Cat. No. 7165-4501

Medium Hexdriver
Cat. No. 7163-1066

Mini Connector
Cat. No. 7163-1186

4.0mm Drill Sleeve
Cat. No. 7167-4083

Universal META-NAIL Compression Driver
Cat. No. 7165-4528

9.0mm Drill Sleeve
Cat. No. 7163-1152

Screw Depth Gauge
Cat. No. 7163-1189

4.0mm Long Pilot Drill*
Cat. No. 7163-1110

4.0mm Short Drill**
Cat. No. 7163-1117

T-Handle
Cat. No. 7167-4076

Screwdriver Release
Cat. No. 7167-4084

* 4.0mm Long Pilot Drill (7163-1110) is interchangeable with 4.0mm AO Long Drill (7163-1121)
** 4.0mm Short Drill (7163-1117) is interchangeable with 4.0mm AO Short Drill (7163-1123)

Locking screw insertion

Proximal locking options include three statically locked threaded holes and one slot that allows for both fracture compression and/or dynamization. These are targeted through the orange and blue color-coded holes on the Anterior Drop.

Distal locking options include three (3) statically locked holes, two (2) ML and one (1) AP. The most distal ML hole is threaded for additional stability.

Gold 5.0mm locking screws are compatible with 10mm, 11.5mm and 13mm diameter nails and grey 4.5mm locking screws with 8.5mm diameter nails.

Note Do not use the 4.0mm Short Step Drill (7164-1123) when drilling for a grey 4.5mm locking screw. Its diameter transitions from 4.0mm to 4.7mm and will drill too large a hole in the near cortex. This may compromise locking screw purchase.

Proximal locking: Static

Make a small incision at the site of screw entry and insert the gold 9.0mm Drill Sleeve and silver 4.0mm Drill Sleeve through the static slot on the Anterior Drop down to bone. Drill both cortices with the 4.0mm Long Pilot Drill*.

Measure for screw length using either the calibrations on the 4.0mm Long Pilot Drill* or by removing the 4.0mm Drill Sleeve and using the Screw Depth Gauge. Attach the appropriate length screw to the end of the Medium Hexdriver (7163-1066) and insert through the gold 9.0mm Drill Sleeve on power until the laser etched ring on the Hexdriver reaches the back of the drill sleeve. Attach the T-Handle to the Hexdriver and tighten the screw by hand.

Proximal locking: Dynamic

With the nail countersunk approximately 10mm, make a small incision at the site of screw entry and insert the gold 9.0mm Drill Sleeve and silver 4.0mm Drill Sleeve through the dynamic slot on the Anterior Drop down to bone. Drill both cortices with the 4.0mm Long Pilot Drill*. Screw measurement and insertion follows the previously described technique.

Use the “TIBIA” and “ALL NAILS” holes marked on the META-NAIL◊ drop.

* 4.0mm Long Pilot Drill (7163-1110) is interchangeable with 4.0mm AO Long Drill (7163-1121)

Final image of the META-NAIL° Tibial Nail with all four proximal screws inserted.

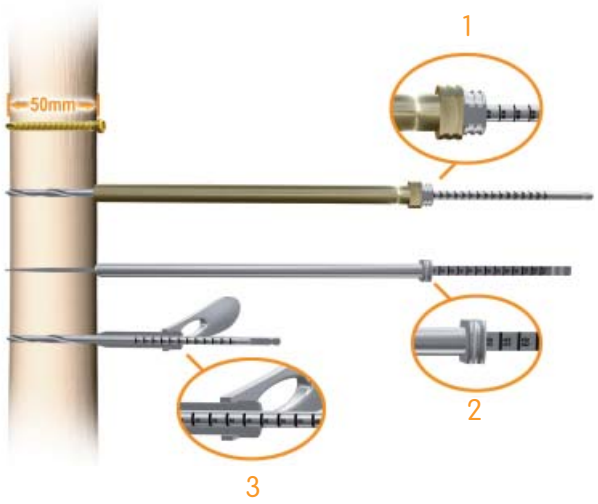
Distal locking

There are three methods:

1 Gold 9.0mm Drill Sleeve, silver 4.0mm Drill Sleeve and 4.0mm Long Pilot Drill*

2 Screw Depth Gauge (7163-1189)

3 Screw Length Sleeve (7167-4085) and 4.0mm Short Drill (7163-1117)**



Proximal locking: Compression

With the nail countersunk approximately 10mm, lock the nail distally first to ensure effective compression and insert a screw through the proximal dynamic slot as previously described. Remove the gold 9.0mm Drill Sleeve and Medium Hexdriver. Attach the Universal META-NAIL Compression Driver (7165-4528) to the T-Handle and insert the assembly through the Guide Bolt into the top of the nail until it contacts the most proximal 5.0mm locking screw. Turn the Compression Driver clockwise to drive the locking screw distally and compress the fracture up to 7mm.

For additional information on Blocking Screws, reference the TRIGEN° META-NAIL Tibial Nail Surgical Technique.

* 4.0mm Long Pilot Drill (7163-1110) is interchangeable with 4.0mm AO Long Drill (7163-1121)
** 4.0mm Short Drill (7163-1117) is interchangeable with 4.0mm AO Short Drill (7163-1123)

Instruments for implant removal

3.2mm Tip Threaded Guide Wire
Cat. No. 7163-1690

Mini Connector
Cat. No. 7163-1186

12.5mm Entry Reamer
Cat. No. 7163-1116

Disposable Nail Extractor***
Cat. No. 7163-1320

Impactor
Cat. No. 7167-4081

One Piece Impactor**
Cat. No. 7163-1185

3.0mm x 1000mm Ball Tip Guide Rod*
Cat. No. 7163-1626

T-Handle
Cat. No. 7167-4076

Slotted Hammer
Cat. No. 7167-4082

Medium Hexdriver
Cat. No. 7163-1066

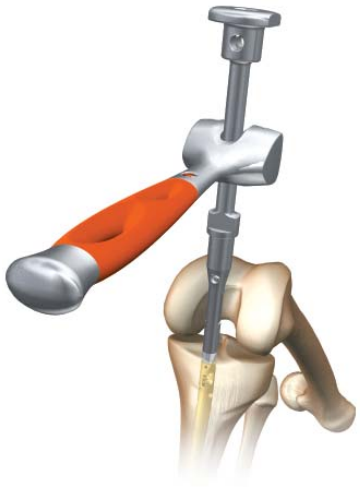
* Additional Guide Rods listed on page 31
** The One Piece Impactor is located in the original TRIGEN® Instrument Set (7163-1326)
*** The Disposable Nail Extractor (7163-1320) is interchangeable with the Large Nail Extractor (7163-1278) located in the original TRIGEN Instrument Set (7163-1326) and the HFN® Instrument Set (7170-0001)

Nail extraction: Optional

Standard technique

Remove the Nail Cap or Nail Cap Set Screw if implanted and all of the distal locking screws with the Medium Hexdriver/T-Handle assembly. Remove all of the proximal locking screws except for one in the same manner.

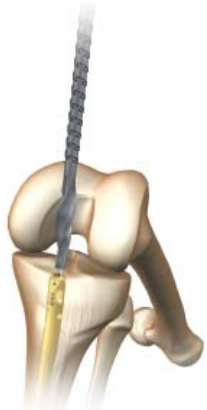
Thread the Impactor (7167-4081) or One Piece Impactor (7163-1185)* into the back of the Disposable Nail Extractor (7163-1320)** and then thread the assembly into the top of the nail. Remove the remaining proximal locking screw and then extract the nail with a back-slapping motion using the Slotted Hammer.



Percutaneous technique

This technique assumes the absence of a Nail Cap or Nail Cap Set Screw. Remove all distal locking screws and all but one of the proximal locking screws as previously described. Under fluoroscopy, insert a 3.2mm Tip Threaded Guide Wire into the top of the nail on power or by hand. Make a 2cm incision around the pin and advance the 12.5mm Entry Reamer over the pin and into the top of the nail to remove any bony in-growth.

Thread the Impactor or One Piece Impactor* into the back of the Disposable Nail Extractor** and then thread the assembly into the top of the nail. Remove the remaining proximal locking screw and then extract the nail with a back-slapping motion.



Note The tip of the Entry Reamer is straight for approximately 1cm before flaring out. It is this portion of the Entry Reamer that enters the top of the nail.

* The One Piece Impactor is located in the original TRIGEN® Instrument Set (7163-1326)

** The Disposable Nail Extractor (7163-1320) is interchangeable with the Large Nail Extractor located in the original TRIGEN Instrument Set (7163-1326) and the HFN® Instrument Set (7170-0001)

Alternative method for extraction

Guide rod jamming technique

Advance the end of a 3.0mm Ball Tip Guide Rod through the end of the nail. Insert a 2.0mm Smooth Guide Rod (7111-8280) in the same manner. With both guide rods in place attach the Gripper to the end of the 3.0mm Ball Tip Guide Rod and pull it back so that it wedges the ball tip against the 2.0mm Smooth Guide Rod. Backslap against the Gripper with the Slotted Hammer to extract the nail.

Guide Rods

Cat. No.	Description
7111-8280	2.0mm x 900mm Smooth (RUSSELL-TAYLOR◇ System)*
7111-8202	3.0mm x 900mm Ball Tip (RUSSELL-TAYLOR System)*
7163-1626	3.0mm x 1000mm Ball Tip (TRIGEN◇ System)

Additional Removal Items

Cat. No.	Description
115074	Large Extractor Hook*
115073	Small Extractor Hook*
914658	Large Easy Out**
914659	Small Easy Out**

* Available sterile packed. For nail removal only, do not use for nail insertion
** Located in RUSSELL-TAYLOR Extraction Kit (Set #7508) available through Loaners

Catalog Information

TRIGEN® Internal Captured Screws 4.5mm and 5.0mm

Set No. 7163-1321

Cat. No.	Length
7164-2120*	Internal Hex Captured Screw 4.5mm x 20mm
7164-2125	Internal Hex Captured Screw 4.5mm x 25mm
7164-2130	Internal Hex Captured Screw 4.5mm x 30mm
7164-2135	Internal Hex Captured Screw 4.5mm x 35mm
7164-2140	Internal Hex Captured Screw 4.5mm x 40mm
7164-2145	Internal Hex Captured Screw 4.5mm x 45mm
7164-2150	Internal Hex Captured Screw 4.5mm x 50mm

7164-2220*	Internal Hex Captured Screw 5.0mm x 20mm
7164-2225	Internal Hex Captured Screw 5.0mm x 25mm
7164-2230	Internal Hex Captured Screw 5.0mm x 30mm
7164-2235	Internal Hex Captured Screw 5.0mm x 35mm
7164-2240	Internal Hex Captured Screw 5.0mm x 40mm
7164-2245	Internal Hex Captured Screw 5.0mm x 45mm
7164-2250	Internal Hex Captured Screw 5.0mm x 50mm
7164-2255	Internal Hex Captured Screw 5.0mm x 55mm
7164-2260	Internal Hex Captured Screw 5.0mm x 60mm
7164-2265	Internal Hex Captured Screw 5.0mm x 65mm
7164-2270	Internal Hex Captured Screw 5.0mm x 70mm
7164-2275	Internal Hex Captured Screw 5.0mm x 75mm

TRIGEN META-NAIL® 8.5mm Tibial

Set No. 7165-3002

Cat. No.	Length	Availability
7165-5016**	META-NAIL Tibial 8.5mm x 16cm	Outlier
7165-5018**	META-NAIL Tibial 8.5mm x 18cm	Outlier
7165-5020**	META-NAIL Tibial 8.5mm x 20cm	Outlier
7165-5022**	META-NAIL Tibial 8.5mm x 22cm	Outlier
7165-5024	META-NAIL Tibial 8.5mm x 24cm	Implant set
7165-5026	META-NAIL Tibial 8.5mm x 26cm	Implant set
7165-5028	META-NAIL Tibial 8.5mm x 28cm	Implant set
7165-5029	META-NAIL Tibial 8.5mm x 29cm	Outlier
7165-5030	META-NAIL Tibial 8.5mm x 30cm	Implant set
7165-5031	META-NAIL Tibial 8.5mm x 31cm	Outlier
7165-5032	META-NAIL Tibial 8.5mm x 32cm	Implant set
7165-5033	META-NAIL Tibial 8.5mm x 33cm	Implant set
7165-5034	META-NAIL Tibial 8.5mm x 34cm	Implant set
7165-5035	META-NAIL Tibial 8.5mm x 35cm	Implant set
7165-5036	META-NAIL Tibial 8.5mm x 36cm	Implant set
7165-5037	META-NAIL Tibial 8.5mm x 37cm	Implant set
7165-5038	META-NAIL Tibial 8.5mm x 38cm	Implant set
7165-5039	META-NAIL Tibial 8.5mm x 39cm	Outlier
7165-5040	META-NAIL Tibial 8.5mm x 40cm	Outlier
7165-5041	META-NAIL Tibial 8.5mm x 41cm	Outlier
7165-5042	META-NAIL Tibial 8.5mm x 42cm	Outlier
7165-5043**	META-NAIL Tibial 8.5mm x 43cm	Outlier
7165-5044**	META-NAIL Tibial 8.5mm x 44cm	Outlier
7165-5046	META-NAIL Tibial 8.5mm x 46cm	Outlier
7165-5048	META-NAIL Tibial 8.5mm x 48cm	Outlier
7165-5050	META-NAIL Tibial 8.5mm x 50cm	Outlier

* The head of the 20mm screw is not internally captured

** Available through special order

Catalog Information

TRIGEN® META-NAIL® 10mm Tibial

Set No. 7165-3000

Cat. No.	Length	Availability
7165-5116*	META-NAIL Tibial 10mm x 16cm	Outlier
7165-5118*	META-NAIL Tibial 10mm x 18cm	Outlier
7165-5120*	META-NAIL Tibial 10mm x 20cm	Outlier
7165-5122*	META-NAIL Tibial 10mm x 22cm	Outlier
7165-5124*	META-NAIL Tibial 10mm x 24cm	Outlier
7165-5126	META-NAIL Tibial 10mm x 26cm	Outlier
7165-5128	META-NAIL Tibial 10mm x 28cm	Implant set
7165-5129	META-NAIL Tibial 10mm x 29cm	Outlier
7165-5130	META-NAIL Tibial 10mm x 30cm	Implant set
7165-5131	META-NAIL Tibial 10mm x 31cm	Outlier
7165-5132	META-NAIL Tibial 10mm x 32cm	Implant set
7165-5133	META-NAIL Tibial 10mm x 33cm	Outlier
7165-5134	META-NAIL Tibial 10mm x 34cm	Implant set
7165-5135	META-NAIL Tibial 10mm x 35cm	Implant set
7165-5136	META-NAIL Tibial 10mm x 36cm	Implant set
7165-5137	META-NAIL Tibial 10mm x 37cm	Implant set
7165-5138	META-NAIL Tibial 10mm x 38cm	Implant set
7165-5139	META-NAIL Tibial 10mm x 39cm	Implant set
7165-5140	META-NAIL Tibial 10mm x 40cm	Implant set
7165-5141	META-NAIL Tibial 10mm x 41cm	Outlier
7165-5142	META-NAIL Tibial 10mm x 42cm	Outlier
7165-5143	META-NAIL Tibial 10mm x 43cm	Outlier
7165-5144	META-NAIL Tibial 10mm x 44cm	Outlier
7165-5146*	META-NAIL Tibial 10mm x 46cm	Outlier
7165-5148*	META-NAIL Tibial 10mm x 48cm	Outlier
7165-5150*	META-NAIL Tibial 10mm x 50cm	Outlier

* Available through special order

TRIGEN® META-NAIL® 11.5mm Tibial

Set No. 7165-3001

Cat. No.	Length	Availability
7165-5216*	META-NAIL Tibial 11.5mm x 16cm	Outlier
7165-5218*	META-NAIL Tibial 11.5mm x 18cm	Outlier
7165-5220*	META-NAIL Tibial 11.5mm x 20cm	Outlier
7165-5222*	META-NAIL Tibial 11.5mm x 22cm	Outlier
7165-5224*	META-NAIL Tibial 11.5mm x 24cm	Outlier
7165-5226	META-NAIL Tibial 11.5mm x 26cm	Outlier
7165-5228	META-NAIL Tibial 11.5mm x 28cm	Outlier
7165-5229	META-NAIL Tibial 11.5mm x 29cm	Outlier
7165-5230	META-NAIL Tibial 11.5mm x 30cm	Implant set
7165-5231	META-NAIL Tibial 11.5mm x 31cm	Outlier
7165-5232	META-NAIL Tibial 11.5mm x 32cm	Implant set
7165-5233	META-NAIL Tibial 11.5mm x 33cm	Outlier
7165-5234	META-NAIL Tibial 11.5mm x 34cm	Implant set
7165-5235	META-NAIL Tibial 11.5mm x 35cm	Implant set
7165-5236	META-NAIL Tibial 11.5mm x 36cm	Implant set
7165-5237	META-NAIL Tibial 11.5mm x 37cm	Implant set
7165-5238	META-NAIL Tibial 11.5mm x 38cm	Implant set
7165-5239	META-NAIL Tibial 11.5mm x 39cm	Implant set
7165-5240	META-NAIL Tibial 11.5mm x 40cm	Implant set
7165-5241	META-NAIL Tibial 11.5mm x 41cm	Outlier
7165-5242	META-NAIL Tibial 11.5mm x 42cm	Outlier
7165-5243	META-NAIL Tibial 11.5mm x 43cm	Outlier
7165-5244	META-NAIL Tibial 11.5mm x 44cm	Outlier
7165-5246*	META-NAIL Tibial 11.5mm x 46cm	Outlier
7165-5248*	META-NAIL Tibial 11.5mm x 48cm	Outlier
7165-5250*	META-NAIL Tibial 11.5mm x 50cm	Outlier

* Available through special order

Catalog Information

TRIGEN® META-NAIL® 13mm Tibial

Cat. No.	Length	Availability
7165-5316*	META-NAIL Tibial 13mm x 16cm	Outlier
7165-5318*	META-NAIL Tibial 13mm x 18cm	Outlier
7165-5320*	META-NAIL Tibial 13mm x 20cm	Outlier
7165-5322*	META-NAIL Tibial 13mm x 22cm	Outlier
7165-5324*	META-NAIL Tibial 13mm x 24cm	Outlier
7165-5326*	META-NAIL Tibial 13mm x 26cm	Outlier
7165-5328*	META-NAIL Tibial 13mm x 28cm	Outlier
7165-5329*	META-NAIL Tibial 13mm x 29cm	Outlier
7165-5330	META-NAIL Tibial 13mm x 30cm	Outlier
7165-5331	META-NAIL Tibial 13mm x 31cm	Outlier
7165-5332	META-NAIL Tibial 13mm x 32cm	Outlier
7165-5333	META-NAIL Tibial 13mm x 33cm	Outlier
7165-5334	META-NAIL Tibial 13mm x 34cm	Outlier
7165-5335	META-NAIL Tibial 13mm x 35cm	Outlier
7165-5336	META-NAIL Tibial 13mm x 36cm	Outlier
7165-5337	META-NAIL Tibial 13mm x 37cm	Outlier
7165-5338	META-NAIL Tibial 13mm x 38cm	Outlier
7165-5339	META-NAIL Tibial 13mm x 39cm	Outlier
7165-5340	META-NAIL Tibial 13mm x 40cm	Outlier
7165-5341	META-NAIL Tibial 13mm x 41cm	Outlier
7165-5342	META-NAIL Tibial 13mm x 42cm	Outlier
7165-5343	META-NAIL Tibial 13mm x 43cm	Outlier
7165-5344	META-NAIL Tibial 13mm x 44cm	Outlier
7165-5346*	META-NAIL Tibial 13mm x 46cm	Outlier
7165-5348*	META-NAIL Tibial 13mm x 48cm	Outlier
7165-5350*	META-NAIL Tibial 13mm x 50cm	Outlier

Nail Cap Set Screw (4.7mm hex)

Cat. No. 7165-6000

TRIGEN Nail Caps

Cat. No.	Length
7163-4000	0mm
7163-4005	5mm
7163-4010	10mm
7163-4015	15mm
7163-4020	20mm

* Available through special order

TRIGEN® META-NAIL Semi-extended Instrument Set

Set No. 7165-4004

Semi-extended Drill Guide

7165-4524

Semi-extended Guide Bolt

7165-4525

Semi-extended Guide Pin Sleeve

7165-4527

Semi-extended Honeycomb

7165-4533 (Not shown)

Semi-extended Entry Tube

7165-4526

Catalog Information

TRIGEN® META-NAIL® Instrument Set

Set No. 7165-4002

META-NAIL Anterior Drop

Cat. No. 7165-4501

META-NAIL Drill Guide

Cat. No. 7165-4502

META-NAIL Extension Drill Guide

Cat. No. 7165-4503

Extension Guide Bolt (23mm)

Cat. No. 7165-4505

Guide Bolt Long (51mm)

Cat. No. 7165-4506

META-NAIL Instrument Case

Cat. No. 7165-4551

META-NAIL Instrument Lid

Cat. No. 7165-4550

Long Screw Length Sleeve

Cat. No. 7165-4520

Short Impactor

Cat. No. 7165-4521

Instruments used if you have TRIGEN® Base Set

Set No. 7167-4012

4.7mm Medium Hexdriver
Cat. No. 7163-1066

4.7mm Short Hexdriver
Cat. No. 7163-1068

12.5mm Entry Reamer
Cat. No. 7163-1116

Guide Bolt Wrench
Cat. No. 7163-1140

9.0mm Drill Sleeve
Cat. No. 7163-1152

Multipurpose Driver
Cat. No. 7163-1161

Mini Connector
Cat. No. 7163-1186

Screw Depth Gauge
Cat. No. 7163-1189

Cannulated Awl
Cat. No. 7167-4000

Entry Portal Tube
Cat. No. 7167-4060

3.2mm T-Handle Trocar
Cat. No. 7167-4074

Honeycomb
Cat. No. 7167-4075

Flexible Reamer Shaft
Cat. No. 7111-8200

Reamer Heads
Cat. No. 7111-8231-8246

T-Handle
Cat. No. 7167-4076

Catalog Information

Reducer
Cat. No. 7167-4077

Obturator
Cat. No. 7167-4078

Ruler
Cat. No. 7167-4079

Gripper
Cat. No. 7167-4080

Impactor
Cat. No. 7167-4081

Slotted Hammer
Cat. No. 7167-4082

4.0mm Drill Sleeve
Cat. No. 7167-4083

Screwdriver Release
Cat. No. 7167-4084

Screw Length Sleeve
Cat. No. 7167-4085

Entry Portal Handle
Cat. No. 7167-4092

Instruments used if you have existing TRIGEN® set

Set No. 7163-1326

Medium Hexdriver
Cat. No. 7163-1066

Short Hexdriver
Cat. No. 7163-1068

Gripper
Cat. No. 7163-1100

12.5mm Entry Reamer
Cat. No. 7163-1116

Obturator
Cat. No. 7163-1122

Reducer
Cat. No. 7163-1124

Ruler
Cat. No. 7163-1128

Guide Bolt Wrench
Cat. No. 7163-1140

Hammer
Cat. No. 7163-1150

9.0mm Drill Sleeve
Cat. No. 7163-1152

4.0mm Drill Sleeve
Cat. No. 7163-1156

Multipurpose Driver
Cat. No. 7163-1161

Catalog Information

T-Handle
Cat. No. 7163-1172

Mini Connector
Cat. No. 7163-1186

Screw Depth Gauge
Cat. No. 7163-1189

Screw Driver Release Handle
Cat. No. 7163-1208

One Piece Impactor
Cat. No. 7163-1185

Flexible Reamer Shaft
Cat. No. 7163-1192

Reamer Heads
Cat. No. 7111-8231-8242

META-NAIL◇ Disposables Set

Set No. 7165-4003

4.0mm Long Pilot Drill*

Cat. No. 7163-1110

4.0mm Short Drill**

Cat. No. 7163-1117

3.0mm x 1000mm Ball Tip Guide Rod

Cat. No. 7163-1626

3.2mm Tip Threaded Guide Wire

Cat. No. 7163-1690

TRIGEN◇ META-NAIL Disposable Compression Driver

Cat. No. 7165-4517

Disposable Nail Extractor***

Cat. No. 7163-1320

* 4.0mm Long Pilot Drill (7163-1110) is interchangeable with 4.0mm AO Long Drill (7163-1121)

** 4.0mm Short Drill (7163-1117) is interchangeable with 4.0mm AO Short Drill (7163-1123)

*** The Disposable Nail Extractor (7163-1320) is interchangeable with the Large Nail Extractor (7163-1278) located in the original TRIGEN Instrument Set (7163-1326) and the HFN◇ Instrument Set (7170-0001)

For additional information on Blocking Screws and Extraction Techniques please reference the TRIGEN® META-NAIL® Tibial Nail Surgical Technique 7118-1112.

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