VERSANAIL®
Tibial

SURGICAL TECHNIQUE

TIBIAL NAILING SYSTEM
OPTIONS MADE EASY

DePuy
a Johnson & Johnson company

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Note: This brochure presents a surgical technique available for use with the DePuy Orthopaedics, Inc. VersaNail® Platform instruments and implants. Surgeons may need to make modifications as appropriate in their own surgical technique with these devices depending on individual patient requirements.

OPTIONS MADE EASY

The DePuy VersaNail Tibial Nail System is part of a long bone nailing system that offers a complete portfolio of implants and instruments based on a standardized technology platform.

DESIGN SUMMARY

The Tibial Nail System from the VersaNail Platform offers an optimal implant design to treat a range of tibia fractures from simple to complex, with versatile locking options. The VersaNail Platform instrumentation is designed to provide options and flexibility for many intraoperative approaches (including percutaneous methods) while maintaining ease of use and commonality.

IMPLANT MATERIAL

All implants are manufactured from 6Al-4V ELI grade, type II anodized titanium alloy (TiMAX™) due to this material's superior properties. TiMAX offers a lower modulus of elasticity and increased fatigue strength over stainless steel.

Instruments

The VersaNail Platform instrumentation system is designed to be intuitive, enabling a simpler and more efficient procedure. The VersaNail Platform's modular nature facilitates the use of common instruments across all VersaNail nailing systems, reducing confusion among the OR staff. For example, VersaNail Platform jigs look and function the same way, and common instruments (such as awls, entry portals, guide wires, nail length gauge, locking instrumentation and screw caddies) can be used across all VersaNail Platform nailing systems.

Jig Options

Two jig options are available for the VersaNail Tibial Nail and are designed to accommodate varying approaches to incision placement.

Fig. 1 The low-profile jig allows radiolucent targeting and is designed with a very low-profile jig nose (Fig.1). This makes it useful for a standard approach, such as a split-patella tendon technique, which requires instrumentation that will not impinge on the patella during nail insertion and allows greater limb extension during locking.

Fig. 2 The extended tibia jig features an extended nose, to accommodate a higher incision point, for a more percutaneous approach if desired (Fig. 2). This jig is designed with the jig mechanics up and out of the way so that the entry site can be targeted from a distance. The targeting arm rotates with the push of a button to target the proximal locking options. The rotating design also allows the jig to be repositioned for convenience during the nailing procedure without disassembly to improve visualization of the nail seating and screw length.

Locking instrumentation is color-coded by screw size for simplicity:

Color Guide	Screw Size	Drill Bit Size	Instruments
Proximal Locking–Purple	5.5 mm	4.4 mm	Sheath, Trocar, Drill Guide
Distal Locking–Green	4.5 mm	3.8 mm	Calibrated Drill Sleeve

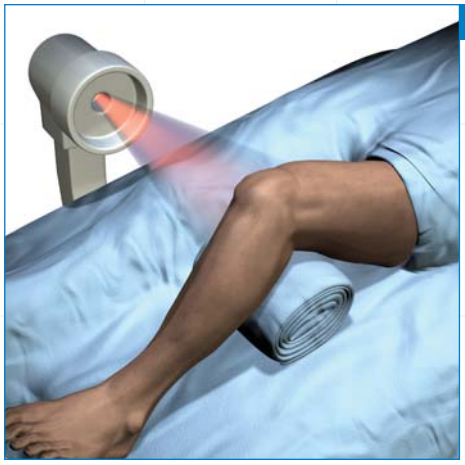


Fig. 3 **Patient Positioning**

Position the patient supine on a radiolucent table (Fig. 3). Knee flexion will assist with identification of the anatomic landmarks to allow accurate incision placement. For ease of distal locking from the medial direction, it is helpful to place the C-arm on the opposite side of the injured limb.

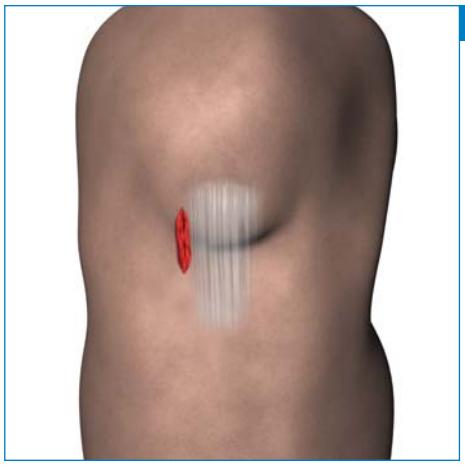


Fig. 4 **Entry Site and Surgical Approach**

Make a proximal incision along the medial aspect of the patellar tendon (Fig. 4). For more proximal fractures, a lateral peri-tendinous approach may be beneficial based on surgeon preference. Continue deep dissection until the proximal aspect of the tibia is encountered.

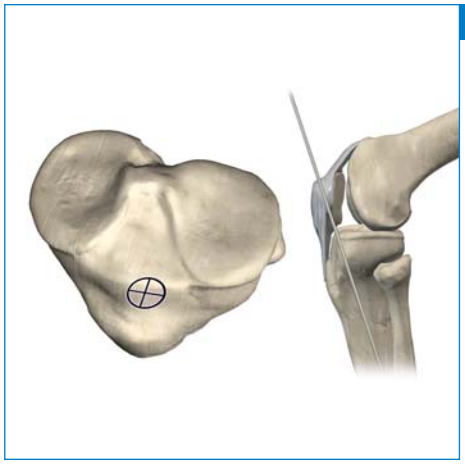


Fig. 5 A starting point is made either with a 3.6 mm x 14 in. guide pin (Cat. No. 2810-01-036) or an awl, based on surgeon preference (Fig. 5). Use A/P and lateral fluoroscopic views to confirm accurate placement. For midshaft and distal tibia fractures, a central starting point in the A/P view is adequate. For more proximal fractures, however, a slightly lateral starting point is recommended to avoid proximal fragment malalignment.

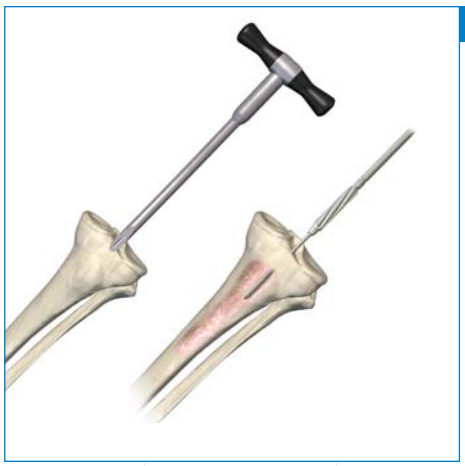


Fig. 6 Use the awl (Cat. No. 2810-01-005) or 11.5 mm cannulated entry reamer (Cat. No. 2810-12-002) to open the proximal tibia. If required, an entry portal sleeve (Cat. No. 2810-12-001) is available for soft tissue protection (Fig. 6).

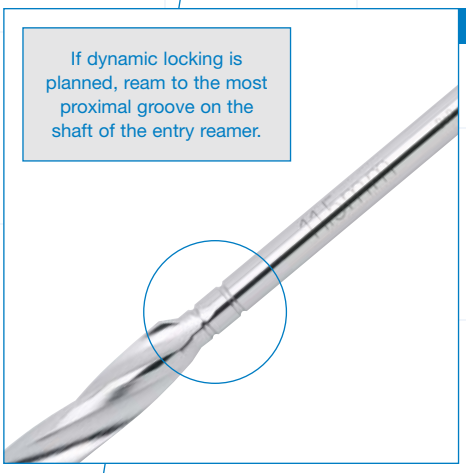


Fig. 7 Fluoroscopically verify the entry point and advance the awl or 11.5 mm entry reamer in line with the tibial canal (Fig. 7). The entry reamer is marked to identify the correct reaming depth depending on whether dynamization will be used. The tibial nail dynamization range is 7 mm.

Fig. 8 Once access to the tibial canal has been gained, place the ball nose guide wire into the entry site utilizing the guide wire gripper. Two guide wire gripper styles are available depending on surgeon preference: the pistol grip (Cat. No. 2810-01-001) or the T-handle grip (Cat. No. 2810-01-002) (Fig. 8).

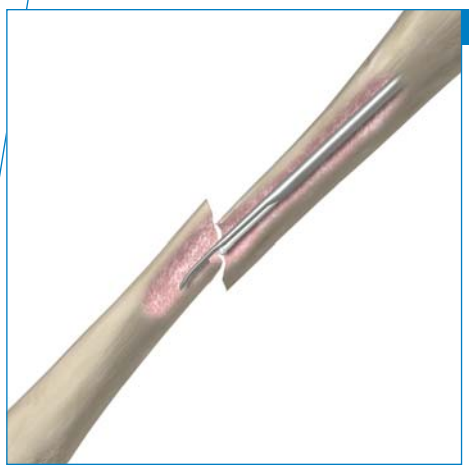


Fig. 9

Fracture Reduction

Obtain appropriate anatomic reduction in order to restore length, alignment and rotation of the injured limb. Reduction can be achieved through the surgeon's preferred method such as traction and/or an external fixator. To aid in manipulating the fracture fragments and passing the ball nose guide wire, large (7.5 mm diameter, Cat. No. 2810-01-007) and small (6.5 mm diameter, Cat. No. 2810-01-008) reduction tools are available.

Insert the reduction tool into the medullary canal, past the fracture site (Fig. 9). Once the fracture is in alignment, place the ball nose guide wire, available in both 80 cm (Cat. No. 2810-01-080) and 100 cm (Cat. No. 2810-01-100) lengths. Remove the reduction tool.

Canal Preparation

Achieve excellent alignment of the injured limb prior to reaming and maintain it throughout the reaming process to avoid eccentric reaming. Commence reaming by placing an intramedullary flexible reamer over the DePuy ball nose guide wire. Ream the medullary canal in half-millimeter increments until cortical bone is reached. Monitor the reaming procedure using image intensification to avoid eccentric or excessive cortex reaming.

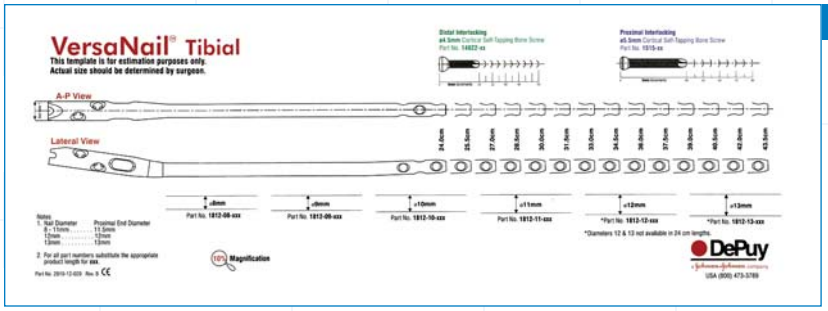


Fig. 10 **Nail Size Selection**

An X-ray template is available to determine nail size preoperatively (Cat. No. 2810-12-020) (Fig. 10).

Nail Diameter Selection

Generally, a nail diameter 1 mm less than the final reamer diameter is chosen. For nail sizes 8-11 mm, the proximal diameter is 11.5 mm. For nail sizes 12 and 13 mm, the proximal nail diameter matches the shaft diameter.

When treating distal tibia fractures with a tibial nail, stresses are increased on the nail's distal portion. For distal tibia fractures, it is recommended that the surgeon use the largest nail diameter that will fit in the medullary canal, without excessive thinning of the cortex.

Fig. 11 **Nail Length Selection**

Slide or snap the nail length gauge (Cat. No. 2810-01-009) onto the ball nose guide wire until it contacts the bone. Read the measurement that lines up with the etch mark on the guide wire to determine the nail length (Fig. 11). A direct measurement can also be taken of the uninjured extremity using either radiographs with magnification markers, or directly on the uninjured limb from the flare of the medial malleolus to the tibial tuberosity's proximal aspect.

Fig. 12 **Jig Options and Assembly**

Depending on surgeon preference, two jig styles are available.

Option 1: The low-profile jig (Cat. No. 2810-12-007) is designed to avoid patellar impingement for those who prefer a low-profile approach (Fig. 12).

Fig. 13 Place the nail onto the jig nose attachment point in the correct orientation, with the distal bend toward the jig. Insert the jig bolt (Cat. No. 2810-12-008) and tighten in a clockwise direction using the cannulated jig bolt driver (Cat. No. 2810-01-011), which is connected to the T-handle hudson (Cat. No. 2810-01-004) (Fig. 13).

Ensure that "center" is visualized on the top of the jig before inserting the nail.

Fig. 14 **Option 2:** The extended tibia jig (Cat. No. 2810-12-003) offers an extended jig nose for those who prefer a percutaneous surgical approach; however, this jig is also useful through standard nailing approaches (Fig. 14).

Fig. 15 Place the nail onto the jig nose attachment point in the correct orientation, with the distal bend toward the jig (Fig. 15). Insert the extended tibia jig bolt (Cat. No. 2810-12-004) and tighten either manually or with a 3/4 in. wrench in a clockwise direction.

The cannulation of the nail will accept the DePuy ball nose guide wire. An exchange tube is not necessary.

Fig. 16

Nail Insertion

Insert the nail over the 3 mm ball nose guide wire into the medullary canal (Fig. 16). Take care not to strike the jig or targeting arm with the mallet. Instead use the hammer pad. Avoid excessive force when inserting the nail. If the nail jams in the medullary canal, extract it and choose the next-smaller diameter nail or prepare the canal appropriately.

Ensure that the push button is tightened securely to the barrel lock mechanism, using the jig bolt driver (Cat. No. 2810-01-011).

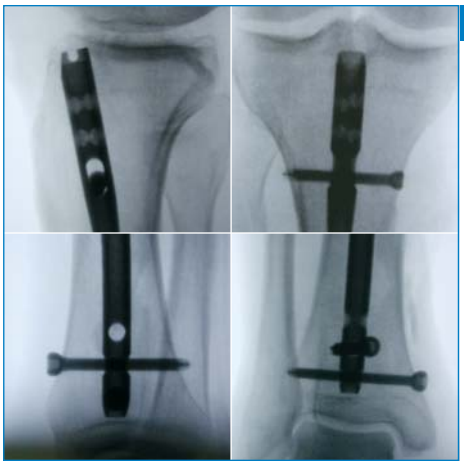


Fig. 17 Confirm fracture reduction and ensure appropriate nail insertion depth proximally and distally with bi-planar fluoroscopy (Fig. 17). Verify nail position to ensure that it has not rotated during insertion. The bevel on the nail's proximal end should be centered on the tibia.

Fig. 18 If using dynamic locking, countersink the nail by at least 7 mm to avoid impingement in the knee joint. The jig nose is marked by two grooves to indicate static and dynamic placement (Fig. 18). Seat the nail to the proximal groove for dynamic locking and to the distal groove for static locking. Once the nail has been inserted, remove the ball nose guide wire.

Fig. 19

Locking

Prior to locking both proximally and distally, compress the fracture and check rotational alignment. The nail can be locked either distally or proximally first, depending on surgeon preference.

Proximal Locking

Using The Low-Profile Jig: Target both oblique holes with the jig (Fig. 19). Use the targeting arm to target the transverse M/L dynamization slot (Cat. No. 2810-12-007).

Fig. 20 Position the targeting arm on the jig so that the medial side is targeted. Tighten the attachment to the jig using the self-contained bolt within the targeting arm (Fig. 20). The targeting arm is marked to indicate which hole should be used for dynamic or static locking.

Fig. 21 **Locking Using The Extended Tibia Jig**

Push the side button until the jig rotates to the desired proximal hole. Etch marks on the top of the jig indicate the jig's correct position for each locking option (Fig. 21).

Etch Mark	Target
S/D	Static/Dynamic Slot
OBL-D	Distal Oblique Hole
CTR	Center Location - **no hole targeted**
OBL-P	Proximal Oblique Hole

Fig. 22 **Dynamization**

A proximal dynamic slot has been incorporated in the nail with a 7 mm range of dynamization. If using dynamization, countersink the nail by at least 7 mm in these cases to avoid backing out into the knee. The jig nose is marked by two grooves to indicate static and dynamic placement (Fig. 22). Seat the nail to the proximal groove for dynamic locking. If dynamization is planned postoperatively, lock the transverse M/L slot in the dynamic mode, allowing the nail to dynamize after removing the oblique screws.

Fig. 23 If dynamization is required immediately, achieve it intraoperatively. Conduct distal locking first, then release a small amount of traction distally and support the foot and ankle while performing a few gentle backslaps with either the slide hammer or slotted mallet over the impactor rod. This compresses the fracture site.

The targeting arm on either the low profile or extended tibia jig is marked for either static or dynamic locking (Fig. 23). For dynamic locking, use the most proximal of the two targeting holes. For static locking, use the most distal of the two holes.

Fig. 24 Place proximal 5.5 mm cortical screws using the purple instrumentation (Fig. 24).

Note: The drill sleeve extends past the screw sheath to allow a smaller incision and a more percutaneous approach. When the drill sleeve is assembled in the screw sheath, the drill sleeve will sit on bone; the sheath will not.

Fig. 25 Place the protective sheath and trocar through the appropriate locking holes in the jig's targeting arm, make a stab incision and bluntly dissect to the bone (Fig. 25).

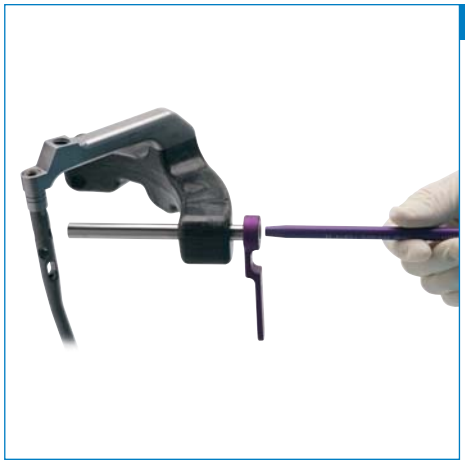


Fig. 26 Remove the trocar and insert the drill sleeve into the sheath until the drill sleeve touches the bone (Fig. 26).

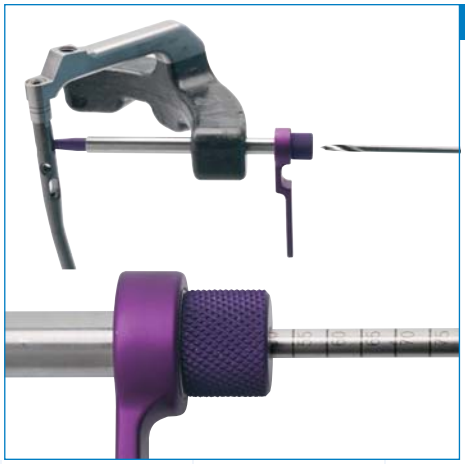


Fig. 27 Drill through the drill sleeve and sheath, across the tibial canal until the far cortex is reached but not penetrated. Read the calibration on the drill bit that lines up with the drill sleeve (Fig. 27). Add 5 mm to the calibrated reading to account for the far cortex.

Fig. 28 Finish drilling through the far cortex. A screw depth gauge is also provided for further screw length verification (Fig. 28). For an accurate reading, take care to ensure the sleeve of the depth gauge is fully seated on the bone.

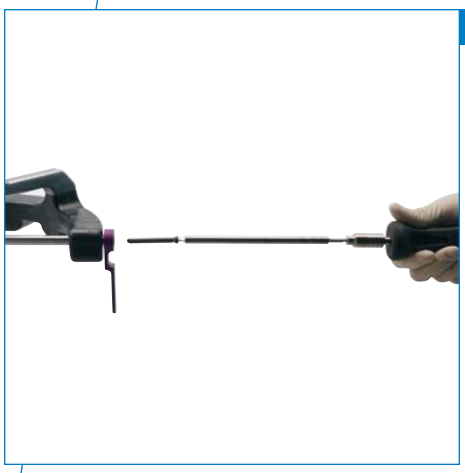


Fig. 29 Verify fluoroscopically to assure the proper screw length selection. Remove the drill guide. Using the 4.5/5.5 mm screwdriver (Cat. No. 2810-01-015), insert the 5.5 mm screw through the sheath (Fig. 29).

Fig. 30 **Distal Locking**

Place distal 4.5 mm cortical locking screws using the green instrumentation (Fig. 30).

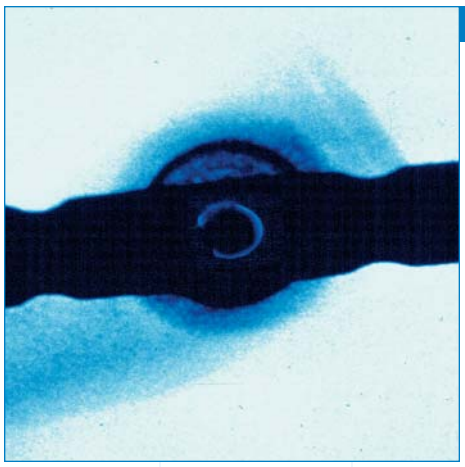


Fig. 31 Use fluoroscopy to conduct distal locking utilizing the standard free-hand technique. A radiolucent targeting wand (Cat. No. 1202) is available to aid in distal locking.

Accurate C-arm position is confirmed when the distal nail hole appears to be a perfect circle (Fig. 31). Once correct placement has been verified fluoroscopically, make a stab wound in direct alignment with the distal hole.

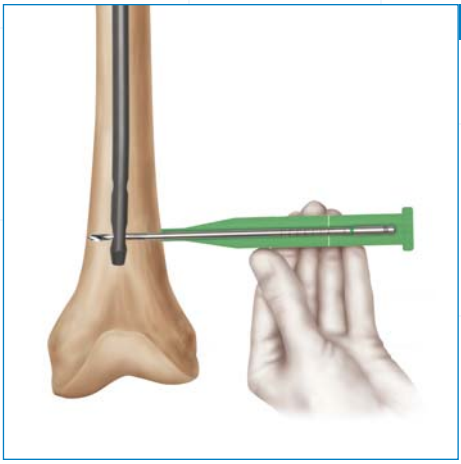


Fig. 32 Using the 3.8 mm drill bit (Cat. No. 6 in: 2810-12-138), drill until the second cortex is penetrated. Verify the drill bit position fluoroscopically prior to taking any measurements (Fig. 32). Place the green 4.5 mm screw length gauge (Cat. No. 2810-01-032) onto the calibrated drill bit and advance down to the bone. Read the calibration on the drill bit that corresponds to the measurement line indicated on the screw length gauge.

A screw depth gauge (Cat. No. 2810-01-017) is also provided for further screw length verification. *For an accurate reading, take care to ensure the 4.5 mm screw length gauge or screw depth gauge sheath is fully seated on the bone.*

Remove the drill bit and advance the 4.5 mm screw. Repeat above steps for additional screw placement. The SolidLok screwdriver (Cat. Nos. 2810-01-020 and 2810-01-021) can be utilized to capture the screw while passing it through soft tissue during screw placement.

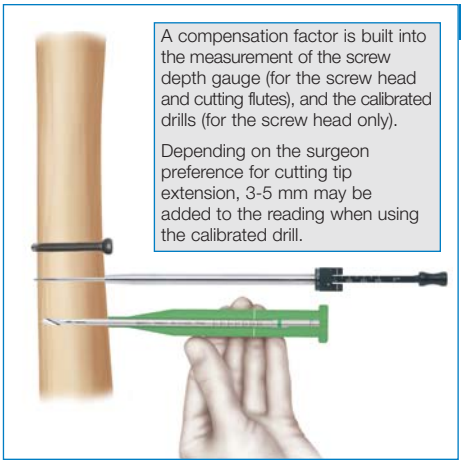


Fig. 33 **Determining Screw Length**

The screw size indicates the total measurement from the tip to the screw head. The calibrated drills and the screw depth gauges have a compensation factor built into the measurement such that the reading should indicate the exact size screw to achieve bi-cortical purchase. To ensure a proper reading, the screw depth gauge and drill sleeves must be touching bone. Fluoroscopy is recommended to verify the correct screw length (Fig. 33).

Fig. 34 **End Cap Placement**

Impinging and non-impinging cannulated end caps are provided in the system to both prevent bony in-growth and add length when needed (Fig. 34).

Fig. 35 End caps have a double hex of 5 mm and 3.5 mm and are cannulated to accept a 3.2 mm guide pin. **Note**: The entry reamer 3.6 mm guide pin will not fit through the end cap.

Place the end cap into the end of the nail with the 4.5 mm screwdriver (Fig. 35). If the end cap will be placed using a 3.2 mm guide pin (Cat. No. 14012-14), place the end cap with the 5 mm jig bolt driver (Cat. No. 2810-01-011).

A locking screwdriver is also available to aid in end cap placement.

Irrigate the joint to ensure that no debris remains. Close the wound.

Fig. 36 **Nail Removal**

If the surgeon deems it appropriate to remove the nail, a cannulated extractor bolt (Cat. No. 2810-01-023), used with 3/4 in. hex driver (Cat. No. 2810-01-027) and T-handle hudson (Cat. No. 2810-01-004), is provided to aid in nail extraction (Fig. 36).

Fig. 37 Locate the top of the nail through an appropriate incision. Remove the end cap. End caps have a double hex of 5 mm and 3.5 mm and are cannulated to accept a 3.2 mm guide pin. Insert the 3.2 mm guide pin and remove the end cap using the cannulated jig bolt driver (Cat. No. 2810-01-011) (Fig. 37).

The SolidLok® locking screwdriver (Cat. Nos. 2810-01-020 and 2810-01-021) is also available to aid in removing the end cap. Insert the SolidLok screwdriver into the hex tip (Cat. No. 2810-01-019) and tighten the handle to lock the end cap's hex tip into the inner end cap's 3.5 mm hex. The end cap can also be removed with a standard 3.5 mm hex screwdriver.

Fig. 38 Make the appropriate incisions and remove all locking screws. Remove all overgrown bone around the nail's proximal aspect to avoid iatrogenic fracture during nail extraction. Once locking screws are removed, drive a 3.2 mm guide pin into the cannulation in the nail's proximal section. Insert the extractor bolt over the 3.2 mm guide pin and thread it into the nail (Fig. 38). **Note**: The 3.6 mm entry guide pin will not fit into the extractor bolt cannulation. Then thread the impactor rod into the extractor bolt and use either the slotted mallet or sliding hammer to remove the nail.

Fig. 39 A conical nail extractor bolt (Cat. No. 2810-01-022) is also available for removal cases where the nail threads are difficult to engage (Fig. 39). This instrument is designed to work with various nail thread/cannulation designs. **Note**: Nail thread/cannulation condition may limit the purchase amount that can be gained using the conical extractor bolt.

Blocking Screw Technique

Blocking screws act as canal fillers and can help prevent nail migration in the canal. Blocking screw placement will vary depending on the fracture pattern.

Proximal

Proximal fracture fragments have a tendency to extend, thereby causing the nail to angulate posteriorly within this fragment. There is also a tendency for these fractures to produce valgus malalignment secondary to the nail angulating laterally within the proximal fragment. A more lateral starting point, the use of a semi-extended approach, or the use of a temporary fixator can assist with obtaining appropriate alignment and starting point when nailing proximal fractures. Screws can be used to change the canal's geometry to block anterior and medial migration.

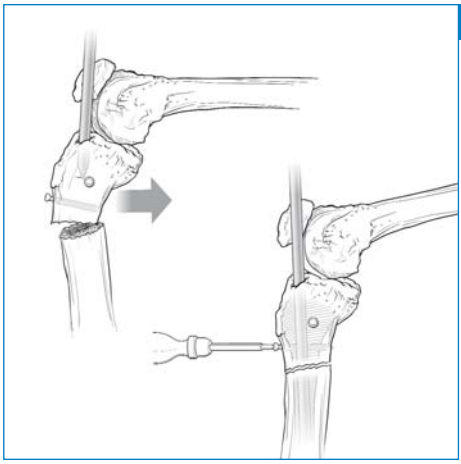


Fig. 40 To block anterior migration, place the screw transversely in the proximal fragment, posterior to the nail, preventing procurvatum deformity of the fragment (Fig. 40).

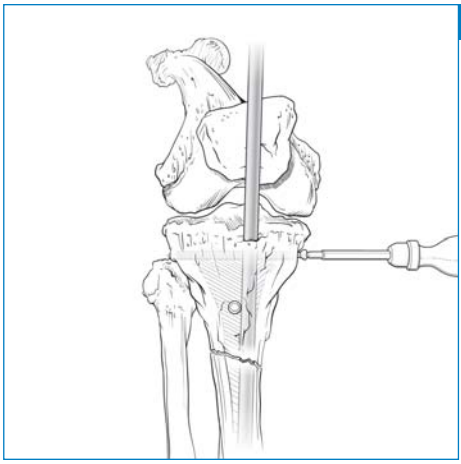


Fig. 41 To block medial migration, place the screw anterior to posterior, lateral to the nail, to prevent valgus-deforming anterior compartment muscle forces (Fig. 41).

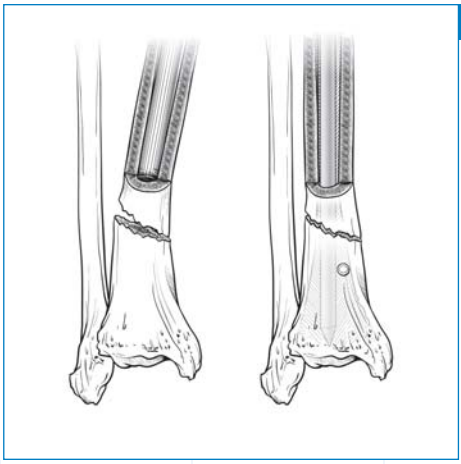


Fig. 42

Distal

In distal fractures where the fibula is intact, the goal is to avoid varus deformity. Therefore the screw is placed medial to the nail (Fig. 42). Where the fibula is fractured, avoid valgus deformity by placing the screw lateral to the nail. With the post-isthmal fracture, place the screw on the metaphyseal side, lateral to the nail. As the nail fits tightly in the isthmus, only one fragment can be manipulated by the blocking screw.

TECHNIQUE

Place 2.5 mm bayonet-tipped K-wires in the appropriate blocking position according to the fracture. Once the nail is inserted, these are replaced by 3.5 mm solid cortical screws.

ADDITIONAL ITEMS TO HAVE AVAILABLE FOR BLOCKING SCREW TECHNIQUE:

Description	Cat. No.
2.5 mm x 9 in. Guide Wires Bayonet Point	1632-18-000
2.9 mm Solid Drill Bit	8290-31-070
Universal Screwdriver Handle	8241-65-000
2.5 mm Screwdriver Shank	8241-57-070
3.5 mm Cortical Screws	8150-36-XXX

IMPORTANT

This Essential Product Information does not include all of the information necessary for selection and use of a device. Please see full labeling for all necessary information.

INDICATIONS

The use of metallic surgical appliances (orthopaedic screws, intramedullary nails, plates, compression hip screws) provides the orthopaedic surgeon a means of bone fixation and helps generally in the management of fractures and reconstructive surgeries. These implants are intended as a guide to normal healing, and are **NOT** intended to replace normal body structure or bear the weight of the body in the presence of incomplete bone healing. Delayed unions or nonunions in the presence of load bearing or weight bearing might eventually cause the implant to break due to metal fatigue. All metal surgical implants are subjected to repeated stress in use, which can result in metal fatigue.

CONTRAINDICATIONS

Orthopaedic screws, intramedullary nails, plates, and compression hip screws are contraindicated in: active infection, conditions which tend to retard healing such as blood supply limitations, previous infections, insufficient quantity or quality of bone to permit stabilization of the facture complex, conditions that restrict the patient's ability or willingness to follow postoperative instructions during the healing process, and foreign body sensitivity.

- **Additional Contraindication for Orthopaedic Screws and Plates only:** Cases with malignant primary or metastatic tumors which preclude adequate bone support or screw fixations, unless supplemental fixation or stabilization methods are utilized.
- **Additional Contraindications for Intramedullary Nails only:** Cases where the nail would cross open epiphyseal plates in skeletally immature patients and obliterated medullary canal or other conditions which tend to retard healing such as blood supply limitations, or previous infections.
- **Additional Contraindication for Retrograde Femoral Nailing:** A history of septic arthritis of the knee and knee extension contracture with inability to attain at least 45º of flexion.
- **Additional Contraindications for Compression Hip Screws only:** Cases where the screw-plate combination would cross open epiphyseal plates in skeletally immature patients, and inadequate implant support due to the lack of medial buttress.

WARNINGS AND PRECAUTIONS

Bone screws and pins are intended for partial weight bearing and non-weight bearing applications. These components cannot be expected to withstand the unsupported stresses of full weight bearing.

ADVERSE EVENTS

The following are the most frequent adverse events after fixation with orthopaedic screws, intramedullary nails, plates and compression hip screws: loosening, bending, cracking or fracture of the components or loss of fixation in bone attributable to nonunion, osteoporosis, markedly unstable comminuted fractures; loss of anatomic position with nonunion or malunion with rotation or angulation; infection and adverse reactions to the device material.

Additional Adverse Events for Compression Hip Screw only: Screw cutout of the femoral head (usually associated with osteoporotic bone).

VERSANAIL PLATFORM

Tibia Nail 8 mm 25.5-42 cm

Cat. No.	Description
1812-08-255	8 mm x 25.5 cm
1812-08-270	8 mm x 27 cm
1812-08-285	8 mm x 28.5 cm
1812-08-300	8 mm x 30 cm
1812-08-315	8 mm x 31.5 cm
1812-08-330	8 mm x 33 cm
1812-08-345	8 mm x 34.5 cm
1812-08-360	8 mm x 36 cm
1812-08-375	8 mm x 37.5 cm
1812-08-390	8 mm x 39 cm
1812-08-405	8 mm x 40.5 cm
1812-08-420	8 mm x 42 cm

Tibia Nail 10 mm 25.5-42 cm

Cat. No.	Description
1812-10-255	10 mm x 25.5 cm
1812-10-270	10 mm x 27 cm
1812-10-285	10 mm x 28.5 cm
1812-10-300	10 mm x 30 cm
1812-10-315	10 mm x 31.5 cm
1812-10-330	10 mm x 33 cm
1812-10-345	10 mm x 34.5 cm
1812-10-360	10 mm x 36 cm
1812-10-375	10 mm x 37.5 cm
1812-10-390	10 mm x 39 cm
1812-10-405	10 mm x 40.5 cm
1812-10-420	10 mm x 42 cm

Tibia Nail 12 mm 25.5-42 cm

Cat. No.	Description
1812-12-255	12 mm x 25.5 cm
1812-12-270	12 mm x 27 cm
1812-12-285	12 mm x 28.5 cm
1812-12-300	12 mm x 30 cm
1812-12-315	12 mm x 31.5 cm
1812-12-330	12 mm x 33 cm
1812-12-345	12 mm x 34.5 cm
1812-12-360	12 mm x 36 cm
1812-12-375	12 mm x 37.5 cm
1812-12-390	12 mm x 39 cm
1812-12-405	12 mm x 40.5 cm
1812-12-420	12 mm x 42 cm

5.5 mm Solid Cortical Bone Screws Full Thread (Proximal)

Cat. No.	Description	
1515-25	25 mm	Length
1515-30	30 mm	Length
1515-35	35 mm	Length
1515-40	40 mm	Length
1515-45	45 mm	Length
1515-50	50 mm	Length
1515-55	55 mm	Length
1515-60	60 mm	Length
1515-65	65 mm	Length
1515-70	70 mm	Length
1515-75	75 mm	Length
1515-80	80 mm	Length

End Caps

Cat. No.	Description
1812-00-001	End Cap Tibial Impinging
1813-00-001	End Cap Universal Flush
1813-00-005	End Cap Universal 5 mm
1813-00-010	End Cap Universal 10 mm
1813-00-015	15 mm End Cap

VERSANAIL PLATFORM

Tibia Nail 9 mm 25.5-42 cm

Cat. No.	Description
1812-09-255	9 mm x 25.5 cm
1812-09-270	9 mm x 27 cm
1812-09-285	9 mm x 28.5 cm
1812-09-300	9 mm x 30 cm
1812-09-315	9 mm x 31.5 cm
1812-09-330	9 mm x 33 cm
1812-09-345	9 mm x 34.5 cm
1812-09-360	9 mm x 36 cm
1812-09-375	9 mm x 37.5 cm
1812-09-390	9 mm x 39 cm
1812-09-405	9 mm x 40.5 cm
1812-09-420	9 mm x 42 cm

Tibia Nail 11 mm 25.5-42 cm

Cat. No.	Description
1812-11-255	11 mm x 25.5 cm
1812-11-270	11 mm x 27 cm
1812-11-285	11 mm x 28.5 cm
1812-11-300	11 mm x 30 cm
1812-11-315	11 mm x 31.5 cm
1812-11-330	11 mm x 33 cm
1812-11-345	11 mm x 34.5 cm
1812-11-360	11 mm x 36 cm
1812-11-375	11 mm x 37.5 cm
1812-11-390	11 mm x 39 cm
1812-11-405	11 mm x 40.5 cm
1812-11-420	11 mm x 42 cm

Tibia Nail 13 mm 25.5-42 cm

Cat. No.	Description
1812-13-255	13 mm x 25.5 cm
1812-13-270	13 mm x 27 cm
1812-13-285	13 mm x 28.5 cm
1812-13-300	13 mm x 30 cm
1812-13-315	13 mm x 31.5 cm
1812-13-330	13 mm x 33 cm
1812-13-345	13 mm x 34.5 cm
1812-13-360	13 mm x 36 cm
1812-13-375	13 mm x 37.5 cm
1812-13-390	13 mm x 39 cm
1812-13-405	13 mm x 40.5 cm
1812-13-420	13 mm x 42 cm

4.5 mm Solid Cortical Bone Screws Full Thread (Distal)

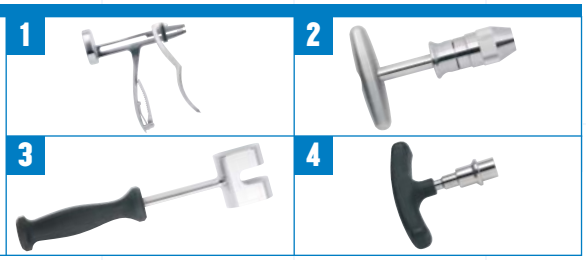
Cat. No.	Description
14022-24	24 mm Length
14022-28	28 mm Length
14022-32	32 mm Length
14022-36	36 mm Length
14022-40	40 mm Length
14022-44	44 mm Length
14022-48	48 mm Length
14022-52	52 mm Length
14022-56	56 mm Length
14022-60	60 mm Length

Indicates outlier size not included in standard set configuration

INSTRUMENT CATALOG NUMBERS AND DESCRIPTIONS

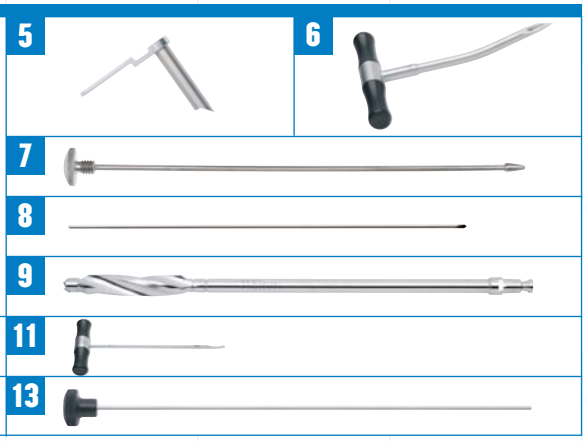
GENERAL

2810-01-001	Pistol Guide Wire Gripper	1
2810-01-002	T-handle Guide Wire Gripper	2
2810-01-003	Slotted Mallet	3
2810-01-004	T-handle Hudson	4



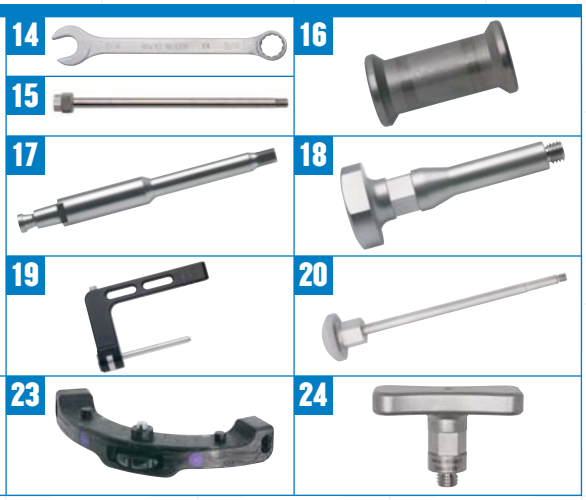
CANAL PREP

2810-12-001	Short Entry Portal	5
2810-01-005	Curved Cannulated Awl	6
2810-01-025	Awl Stylus	7
2810-01-036	Guide Pin 3.6 mm x 14 in.	8
2810-12-002	11.5 mm Entry Reamer Tibia	9
2810-01-007	Long Reduction Tool	10
2810-01-008	Short Reduction Tool	11
2810-01-009	Nail Length Gauge	12
2810-01-026	Guide Wire Pusher Tool	13



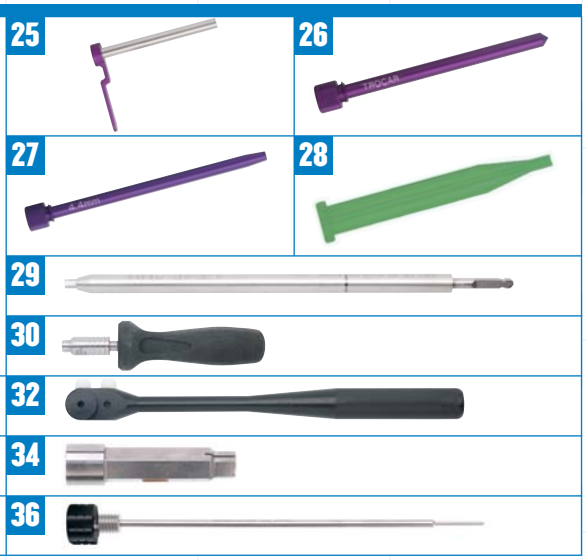
NAIL INSERTION

1186	3/4 in. Combination Wrench	14
1095	Impactor Rod Assembly	15
1096	Hammer Sliding Impactor	16
2810-01-011	Jig Bolt Driver 5 mm	17
2810-12-031	Hammer Pad Non-Cannulated	18
2810-12-003	Extended Tibia Jig Complete	19
2810-12-004	Extended Tibia Jig Bolt	20
2810-12-007	Low Profile Tibia Jig	21
2810-12-008	Low Profile Tibia Jig Bolt	22
2810-12-009	Low Profile Tibia Target Arm	23
2810-12-017	Extended Tibia Jig Hammer Pad	24



LOCKING

2810-12-010	5.5 mm Screw Sheath	25
2810-12-011	5.5 mm Screw Trocar	26
2810-12-012	4.4 mm Drill Sleeve	27
2810-01-032	4.5 mm Screw Length Gauge	28
2810-01-015	4.5/5.5 mm Screwdriver Shaft	29
2141-49-000	Lg Cann Screwdriver Handle	30
2810-01-016	Countersink Shaft	31
1202	Free-hand Distal Targeting Device	32
2810-01-017	Screw Depth Gauge	33
2810-01-019	SolidLok Hex Tip 3.5 mm	34
2810-01-020	SolidLok Screwdriver Handle	35
2810-01-021	SolidLok Driver Inner Shaft	36



NAIL REMOVAL

14012-14	3.2 mm x 14 in. Short Threaded Guide Pin	37
2810-01-022	Conical Extractor Tool	38
2810-01-023	Extractor Bolt Tibia/Femur	39
2810-01-027	3/4 in. Hex Driver	40

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2810-12-044	4.4 mm Drill Bit	42
2810-01-080	Ball Nose Guide Wire 80 cm	43
2810-01-100	Ball Nose Guide Wire 100 cm	44

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DISPOSABLES—NON-STERILE

14012-14	3.2 mm x 14 in. Short Threaded Guide Pin	
2810-01-036	Guide Pin 3.6 mm x 14 in.	
2810-12-138	3.8 mm Drill Bit 6 in. – Non-Sterile	45
2810-12-144	4.4 mm Drill Bit – Non-Sterile	46
2810-01-019	SolidLok Hex Tip 3.5 mm	47

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2810-12-005	Extended Tibia Jig Replacement Kit	49
2810-12-006	Extended Tibia Jig Spring	50

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1245	Radiographic Ruler	54
1812-99-315	Tibial Nail DNI 9 mm x 31.5 cm	

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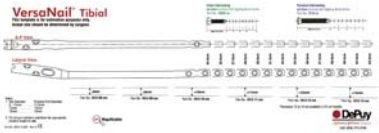

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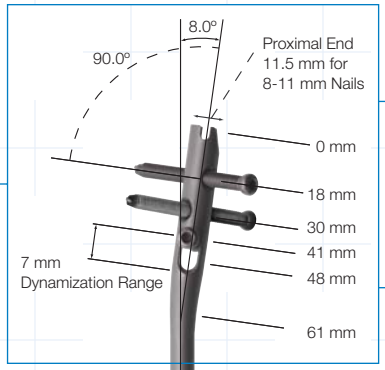
TIBIAL NAILING SYSTEM

Enhanced locking options treat a range of fracture patterns

Oblique orientation of the proximal locking screws provides maximum stability

Large core diameter of the proximal 5.5 mm screws decreases risk for screw breakage



Proximal 8° bend located 6 cm from the top of the nail is anatomically matched to prevent potential proximal fracture displacement

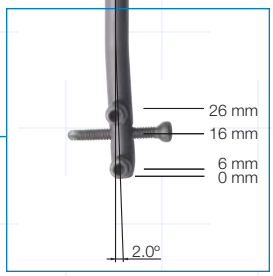
Dynamization slot with a 7 mm range of dynamization allows compression at the fracture site

Expanded working length treats a greater range of proximal and distal fractures

Enlarged nail cannulation accepts the ball nose guide wire, eliminating the need for an exchange tube

Bullet-style tip and 2° bend increase ease of insertion

Large core diameter of the distal 4.5 mm screws decreases the risk of screw breakage



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DePuy
a Johnson & Johnson company

DePuy Orthopaedics, Inc.
700 Orthopaedic Drive
Warsaw, IN 46581-0988
USA
Tel: +1 (800) 366 8143
Fax: +1 (574) 267 7196

DePuy International Ltd
St Anthony's Road
Leeds LS11 8DT
England
Tel: +44 (113) 387 7800
Fax: +44 (113) 387 7890

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