



Zimmer® Natural Nail® System

Tibial Nail
Surgical Technique



**Zimmer Natural Nail
System Tibial Nail
Surgical Technique**

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Product Overview

The *Zimmer Natural Nail System* is a system of intramedullary nails, screws, instruments and other associated implants that are designed to provide stable internal fixation for fractured long bones. The nails have been designed for specific applications to help restore the shape of the fractured bone to its natural, pre-injured state.

The Tibial Nail is designed to help treat various fractures of the tibia. Screws are placed through the nail to secure the implant in place and maintain length and alignment while healing occurs. The nail has multiple screw holes in the proximal body to allow surgeons to address different fracture types. The proximal slot allows for compression or dynamization across a fracture.

A choice of lengths and diameters is available to match the individual anatomy of the patient.

Implant Overview

Nail Diameters: 8.3, 9.3, 10, 11, 12, 13, 14mm

Nail Lengths: 24 to 44cm in 2cm increments

Proximal Screw Diameter: 5.0mm

Proximal Screw Lengths: 20 to 60mm in 2.5mm increments, 65 to 100mm in 5mm increments

Distal Screw Diameter: 4.0mm for 8.3mm diameter nails

5.0mm for 9.3mm and larger diameter nails

Distal Screw Lengths: 20 to 60mm in 2.5mm increments, 65 to 100mm in 5mm increments

Materials: Ti-6Al-4V alloy and stainless steel (22-13-5)

Precision instrumentation is provided to help implant the nail. Many of the instruments and implants feature color coding to help the surgical team use the system, easily and efficiently. Certain universal instruments are not color coded. The color coding system is referenced in the technique. A wall chart (97-2495-003-00) is also available to help explain the color coding system.

The technique is written to explain use of the TALL length guide which should be used when the knee is in flexion. A shorter guide (labeled SMALL) is also available for use when the knee is in extension. The use of these SMALL instruments requires a more distal incision. Differences between the SMALL and TALL technique will be noted.

Indications

The *Zimmer Natural Nail System* is intended for temporary fracture fixation and stabilization of the bone.

Indications for the tibial nails include the following:

- Compound and simple shaft fractures
- Proximal, metaphyseal and distal shaft fractures
- Segmental fractures
- Comminuted fractures
- Fractures involving osteopenic and osteoporotic bone
- Pathological fractures
- Fractures with bone loss
- Periprosthetic fractures
- Pseudoarthrosis, non-union, mal-union and delayed union

- Surgically created defects such as osteotomies

Contraindications

- A medullary canal obliterated by a previous fracture or tumor
- Bone shaft having excessive bow or deformity
- Lack of bone substance or bone quality which makes stable seating of the implant impossible
- All concomitant diseases that can impair the functioning and the success of the implant
- Infection
- Insufficient blood circulation
- Skeletally immature patients

WARNING: This nail should only be used to treat a periprosthetic fracture if the in situ device is firmly fixed. When treating a periprosthetic fracture, the nail should be positioned so that it does not come in contact with the in situ device.

Surgical Technique

Preoperative Planning

Preoperative planning is recommended before beginning the surgical procedure. A/P and Lateral x-rays of the injured tibia should be taken preoperatively and evaluated for length, canal size and implant suitability. A/P and Lateral x-rays of the contralateral uninjured tibia can also be taken preoperatively to provide insight into the characteristics of the pre-injured tibia.

Patient Positioning

The patient should be positioned in the supine position. The positioning should allow the knee of the injured leg to be placed in at least 90° of flexion. The use of a fracture table can be beneficial to help reduce fractures as well as to facilitate intraoperative imaging with a C-arm. The C-arm should be placed to allow for imaging of the tibia in both planes along the entire length of the bone.

Drape the patient appropriately to allow the surgeon to work from the knee to the foot.

Reduction

It is critical to achieve anatomic reduction before beginning any of the steps to place the IM Nail. Traction should be used as necessary to help achieve fracture reduction. Several instruments are available to assist in fracture reduction including clamps, ball spike pushers and Steinman pins.

Starting Point Location

The starting point for the nail is located on the shelf of the tibia, just medial to the Lateral Intracondylar Eminence. With the knee in flexion, incise the tissue along the medial border of the patellar ligament extending from the joint line to the inferior pole of the patella. There are several techniques for managing the patellar tendon and alternative incisions are also appropriate as long as they allow for nail entry at this point. Use a retractor if necessary to help manage the tendon.



Fig. 1

Small Technique Note: As the knee is in a much less flexed position, the incision is more distal. The starting point in the bone remains the same, regardless of technique.

Place the 3.0mm pin into the starting point. Use the C-arm to visualize the pin's position from A/P and Lateral views. The pin should be inserted at the identified point heading slightly posterior into the medullary canal. The TISSUE PROTECTOR and retractors can help protect the surrounding soft tissues during the procedure.

Drive the pin through the starting point into the center of the medullary canal (Figure 1). Use the 8mm ENTRY REAMER to ream an entry portal into the proximal tibia through the starting point. Remove the reamer and 3.0mm pin.

Alternatively, an AWL or a 12mm ENTRY REAMER can be used to find the entry point and create the entry portal (Figure 2).



Fig. 2

Use the 12.0mm ENTRY REAMER to prepare the proximal tibia for the proximal portion of the nail. The groove indicates the final position of the top of the nail. In addition, the c-arm should be used to visualize the depth of the reamer in the proximal tibia. Care should be taken to keep the reamer in line with the shaft of the tibia to avoid reaming through the cortex of the tibia.

Place a 3.0mm x 100cm ball tip guide wire (47/00-2255-008-01) into the medullary canal all the way into the distal tibia. To aid in manipulation, bend the tip of the guide wire at about a 10 degree angle 5cm from the end.

CAUTION: If the guide wire is bent shorter than 5cm from the end of the wire and/or more than 10 degrees it may be difficult to remove from the nail. If the wire becomes lodged inside the nail, utilize the GUIDE WIRE GRIPPER and mallet to remove the guide wire from the nail.

Fluoroscopy can assist you in guiding the wire past the fracture site. If you plan to ream the canal of the tibia, the ball tip wire should be centered and embedded in the distal tibia at the level of the distal epiphyseal scar using the GUIDE WIRE GRIPPER and a MALLET (Figure 3). Care should be taken not to drive the wire through the ankle joint.

Assemble the two piece NAIL LENGTH GAUGE. Slide the tube portion of the gauge over the 3.0mm x 100cm ball tip guide wire until the tip of the tube is at the level of the entry point (confirm position using fluoroscopy)(Figure 4). The proximal end of the ball tip guide wire indicates the length of the wire in the canal (Figure 5). When determining nail length, consideration should be taken as to how deep the nail will be inserted into the tibia based upon the desired location of the proximal screws. A RULER is also included in the set which can be used to radiographically determine nail length.

If a 70cm ball tip wire is used, measure the length of the canal by sliding only the half of the NAIL LENGTH GAUGE that is etched with length measurements to the level of the entry point. The proximal end of the 70cm ball tip wire will indicate the length of the wire that is in the canal.

Reaming

Start with a small reamer. Increase the diameter of the reamer by 0.5 - 1.0mm depending on the amount of resistance felt while reaming (Figure 6). The GUIDE WIRE PUSHER can help prevent the ball tip guide wire from coming out of the tibia during reaming. When cortical chatter occurs, stop reaming. Choose a nail that is 1.0 – 1.5mm smaller than the last reamer used. The proximal diameter of nails equal to or smaller than 11mm in diameter is 11mm. For nails 11mm and larger in diameter, the diameter of the nail is constant. If a nail smaller than 11mm is to be used, be sure to ream the proximal portion of the bone to 11.5mm to accommodate the proximal portion of the nail.



Fig. 3



Fig. 4



Fig. 5



Fig. 6

NOTE: If the GUIDE WIRE becomes lodged within the reamer, use the GUIDE WIRE PUSHER to push the guide wire back into the IM canal.

Nail Assembly and Insertion

The color code for the tibial nail is YELLOW. Ti-6Al-4V alloy nails, the TARGETING GUIDE and the CONNECTING BOLT all have yellow colors and the word YELLOW etched on them. Stainless steel nails contain only the word YELLOW etched on them.

Place the appropriate CONNECTING BOLT (SMALL or TALL) through the barrel of the corresponding TARGETING GUIDE HANDLE. Begin threading the CONNECTING BOLT (by hand or using the CONNECTING BOLT INSERTER) into the proximal portion of the nail. Orient the nail so that the distal portion of the nail angles anterior, the same direction as the TARGETING GUIDE HANDLE (Figure 7).



Fig. 7

Slots in the top of the nail will match tabs on the TARGETING GUIDE HANDLE to help orient the nail correctly. Completely tighten the CONNECTING BOLT to secure the nail to the guide (Figure 8). The arrow on the nail will line up with the arrow on the barrel of the guide when the nail is correctly aligned.



Fig. 8

Attach the TARGETING MODULE to the TARGETING GUIDE HANDLE. Use a screw cannula, drill sleeve and drill bit to verify that the holes in the guide target the holes in the nail. Remove the TARGETING MODULE **BEFORE** inserting the nail.

Insert the nail over the guide wire with the arm of the guide facing anterior. Monitor the progression of the nail down the canal using the C-arm, especially as the nail is passing through or near the fracture site (Figure 9).



Fig. 9

If the nail does not pass down the canal easily, attach the IMPACTION HEAD to the TARGETING GUIDE HANDLE. Using the MALLET, impact gently on the IMPACTION HEAD (Figure 10). Do not impact the module is attached to the IMPACTION HEAD. Verify that the CONNECTING BOLT is tight while impacting. Do not impact on any other portion of the TARGETING GUIDE HANDLE or MODULE as this may break the guide or cause it to lose its accuracy. If the nail will not advance with impaction, remove the nail and ream the canal to a larger diameter at additional 0.5 mm increments or consider using a smaller diameter nail. Place the top of the nail in line with or below the surface of the tibia, depending on its position relative to the expected screw location. Care should be taken to not pry on the handle as this may cause damage to the instrumentation.

Remove the ball tip guide wire from the nail using the GUIDE WIRE GRIPPER (Figure 11). **If possible, remove the guide wire before fully seating the nail. If desired,**



Fig. 10



Fig. 11

Proximal Screw Placement

All* of the screw holes in the tibial nail allow for standard locking or fixed angle locking. To achieve standard locking, choose a **PARTIALLY THREADED SCREW**. To achieve a fixed angle construct, choose a **FIXED ANGLE SCREW**.

Instruments that are specific to the tibia nail are marked in **YELLOW**. The instruments needed to place screws through the proximal portion of the nail are color coded **ORANGE/ORANGE**. These instruments are placed through holes in the targeting guide which are colored coded **ORANGE**. The chart below details the color coded instruments that are used to target and place screws.

INSTRUMENT TYPE	COLOR CODE
Screw Cannula	Orange/Orange
Trocar	Orange/Orange
4.3mm Drill Sleeve	Orange/Orange & Red
4.3mm Drill Bit	Orange/Orange & Red
Depth Gauge	Orange
Screwdriver	Orange/Orange

Retighten the **CONNECTING BOLT** to the nail.

Attach the **TARGETING MODULE** to the **TARGETING GUIDE HANDLE** (Figure 12). Select the screw holes that will be used in the nail. Insert **HOLE INDICATORS** in the holes in the **TARGETING MODULE** that will **NOT** be used.



Fig. 12

Slide the **TROCAR** into the **SCREW CANNULA**. Slide the **SCREW CANNULA** through one of the selected holes in the **TARGETING MODULE**. Dissect through the tissue down to the bone to make a path for the **SCREW CANNULA** (Figure 13). Advance the **SCREW CANNULA** until the tip of the **TROCAR** is against the bone (Figure 14).



Fig. 13



Fig. 14

*Under certain conditions, especially in patients with thin cortical bone, Partially Threaded Screws from 20mm to 32.5mm in length may form a Fixed Angle construct with the nail.

Remove the TROCAR. Insert the 4.3mm DRILL SLEEVE through the CANNULA down to the bone. Place the 4.3mm DRILL BIT through the DRILL SLEEVE. Before the DRILL BIT contacts the bone, start the drill. Advance the spinning DRILL BIT through the bone bicortically. Use fluoroscopy to verify the appropriate location of the DRILL BIT in the bone.

With the DRILL BIT in place and the DRILL SLEEVE pressed against the bone, the length of screw needed is indicated by the etch marks on the DRILL BIT where it exits the SCREW CANNULA (Figure 15). The tip of the drill should be no more than 5mm through the far cortex of the bone to reduce the risk of complications associated with screw protrusion. (Alternatively, the DRILL BIT and DRILL SLEEVE can be removed and the SCREW DEPTH GAUGE used to measure the length of screw.)

Remove the DRILL BIT and DRILL SLEEVE. Place the appropriate length 5.0mm screw (color coded RED) through the SCREW CANNULA into the bone (Figure 16).

Using the screwdriver, advance the screw to achieve bicortical purchase (the screw head should sit on the near cortex of the bone). The screws are self tapping so tapping should not be necessary (Figure 17).

If using the CAPTURED SCREWDRIVER, place the appropriate screw on the 3.5mm HEX and tighten the screw to the CAPTURED SCREWDRIVER by turning the knob next to the handle clockwise.

CAUTION: If using the CAPTURED SCREWDRIVER, do not torque the CAPTURED SCREWDRIVER beyond the calibration line next to the handle. Do not drive the screws into the bone under power, as damage to the bone, screws and nail could result.

Note: Do not overtighten the screws.

Repeat this technique to place additional proximal screws as necessary.

Note: If axial compression is desired, please refer to the Axial Compression section on page 11.

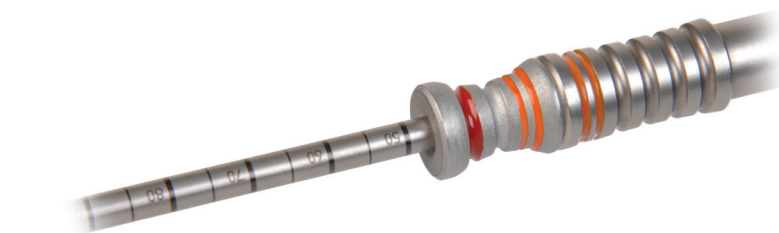


Fig. 15

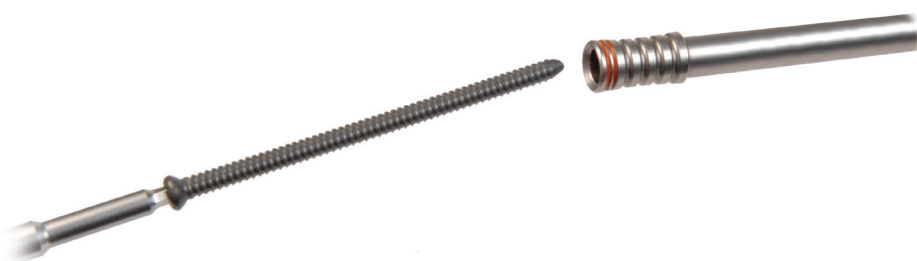


Fig. 16



Fig. 17



Distal Targeting – Freehand Technique

8.3mm nails utilize a 4.0mm screw (3.3mm drill bit) distally. These items are color coded WHITE.

9.3mm and larger diameter nails use a 5.0mm screw (4.3mm drill bit) distally. These items are color coded RED.

Note: There is no color indication on the screw itself. Screw packaging and the screw case contain color coding to help identify the screw size.

Insert the appropriate diameter FREEHAND DRILL BIT into the DISTAL TARGETING WAND. Finger tighten the SET SCREW. Position the C-arm in order to get a lateral view of the distal tibia. Adjust the angle of the C-arm so that the hole through the nail appears as a perfect circle on the monitor. Bring the tip of the drill bit to the skin and use the C-arm to center it over the hole that you desire to place a screw through (Figure 18).

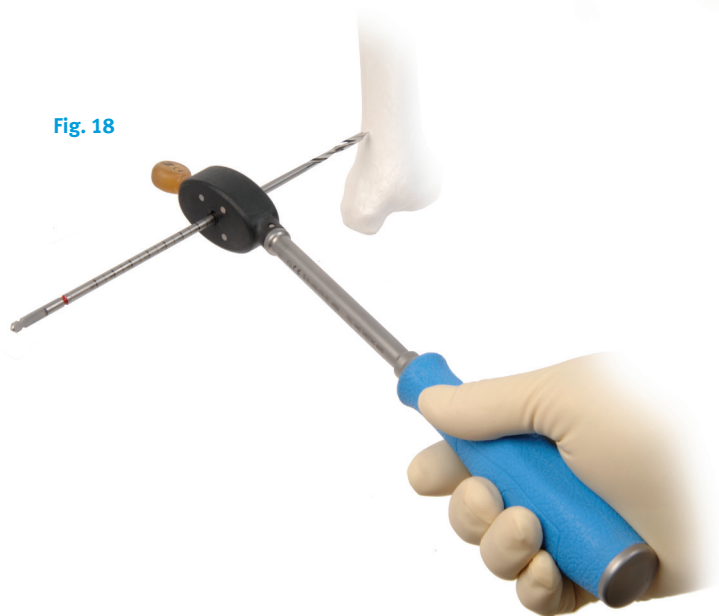


Fig. 18

Make a stab incision at this point and dissect down to the bone. Place the tip of the drill bit against the bone. Verify that the tip of the drill bit is in the center of the hole. While keeping the tip of the drill bit against the bone, move the other end of the drill bit into other positions and take additional fluoroscopic images to verify the position of the tip in the center of the hole. Align the drill bit with the C-arm beam. Tap the drill bit into the bone using the MALLET.

Loosen the SET SCREW and remove the DISTAL TARGETING WAND, leaving the DRILL BIT in place. Slide the FREEHAND TISSUE PROTECTION SLEEVE over the DRILL BIT (Figure 19).

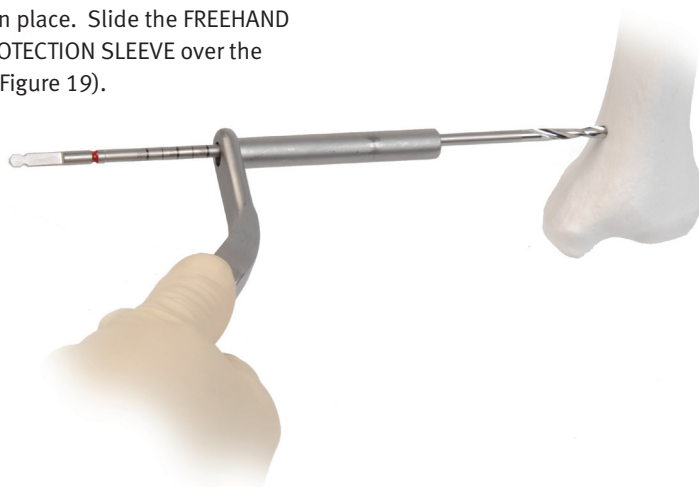


Fig. 19

Attach the DRILL to the DRILL BIT and advance the drill bit through the bone. Verify that the drill bit has gone through the hole in the nail.

Remove the drill bit. Measure the depth of the hole using the FREEHAND SCREW DEPTH GAUGE (Figure 20).

(Alternatively, the appropriate length of screw can be measured using the numbered etch on the DRILL BIT closest to the end of the FREEHAND TISSUE PROTECTION SLEEVE when the DRILL BIT is in the bone and the SLEEVE is touching the bone.) (Figure 21) Insert the appropriate length screw using the screwdriver.

If using the CAPTURED SCREWDRIVER, place the appropriate screw on the 3.5mm HEX and tighten the screw to the CAPTURED SCREWDRIVER by turning the knob next to the handle clockwise.

CAUTION: If using the CAPTURED SCREWDRIVER, do not torque the CAPTURED SCREWDRIVER beyond the calibration line next to the handle. Do not drive the screws into the bone under power, as damage to the bone, screws and nail could result.

Note: Do not overtighten the screws.

Repeat these steps to insert additional distal screws.

Axial Compression

In order to perform axial compression, only one screw can be placed proximally and it must be in the dynamization slot (marked DY on the TARGETING MODULE). At least one screw must be placed distally. Leave the SCREW CANNULA and SCREWDRIVER in place in the proximal screw that was placed in the dynamization slot during this step.

Remove the CONNECTING BOLT. Attach the AXIAL COMPRESSION DEVICE (YELLOW) to the T-HANDLE. Place the AXIAL COMPRESSION DEVICE through the barrel of the TARGETING GUIDE HANDLE and thread it into the proximal portion of the nail. The AXIAL COMPRESSION DEVICE will contact the proximal screw and move the two bone segments together. Remove the SCREW CANNULA and SCREWDRIVER before advancing the AXIAL COMPRESSION DEVICE.

Rotate the T-HANDLE clockwise. When the desired compression is achieved, tighten the nut of the AXIAL COMPRESSION DEVICE to the TARGETING GUIDE. Place at least one additional screw proximally to maintain the compression. Additional screws can be placed proximally and distally as appropriate.



Fig. 20

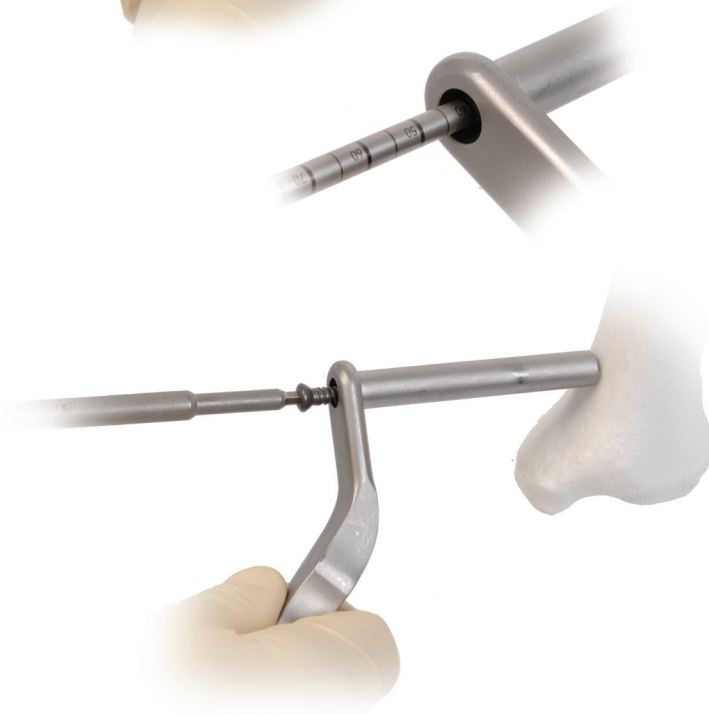


Fig. 21

Finalize Implant Placement

Observe the depth of the nail in proximal tibia. Ridges in the targeting guide barrel indicate depths of 5 and 10mm.

Disconnect the TARGETING MODULE from the TARGETING GUIDE HANDLE and set aside. Place a 2.0MM GUIDE PIN through the guide against the proximal screws. Loosen and remove the CONNECTING BOLT from the nail (Figure 22). Remove the TARGETING GUIDE HANDLE and set aside.



Fig. 22

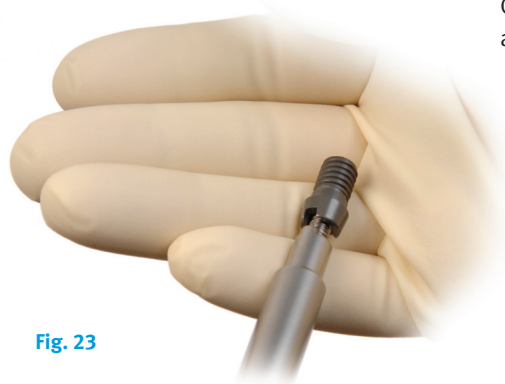


Fig. 23

Choose the appropriate height TIBIAL NAIL CAP. Secure the selected NAIL CAP to the NAIL CAP INSERTER using the NAIL CAP RETAINING SHAFT (Figure 23). Slide the TIBIAL NAIL CAP over the 2.0MM GUIDE PIN and tighten to the nail (Figure 24). Using the C-arm, verify that the cap is completely seated to the top of the nail.



Fig. 24

Disengage the NAIL CAP INSERTER from the TIBIAL NAIL CAP. Remove the 2.0MM GUIDE PIN.

Close all wounds and apply the appropriate dressings.

Postoperative Care

Early range of motion exercises of the knee and ankle are encouraged. Allow toe-touch weight bearing to progress to full weight bearing as fracture callus increases on the x-ray films.*

Nail Extraction

Before attempting to remove any screws or nail caps, clean any bone from the hex of the screw or cap.

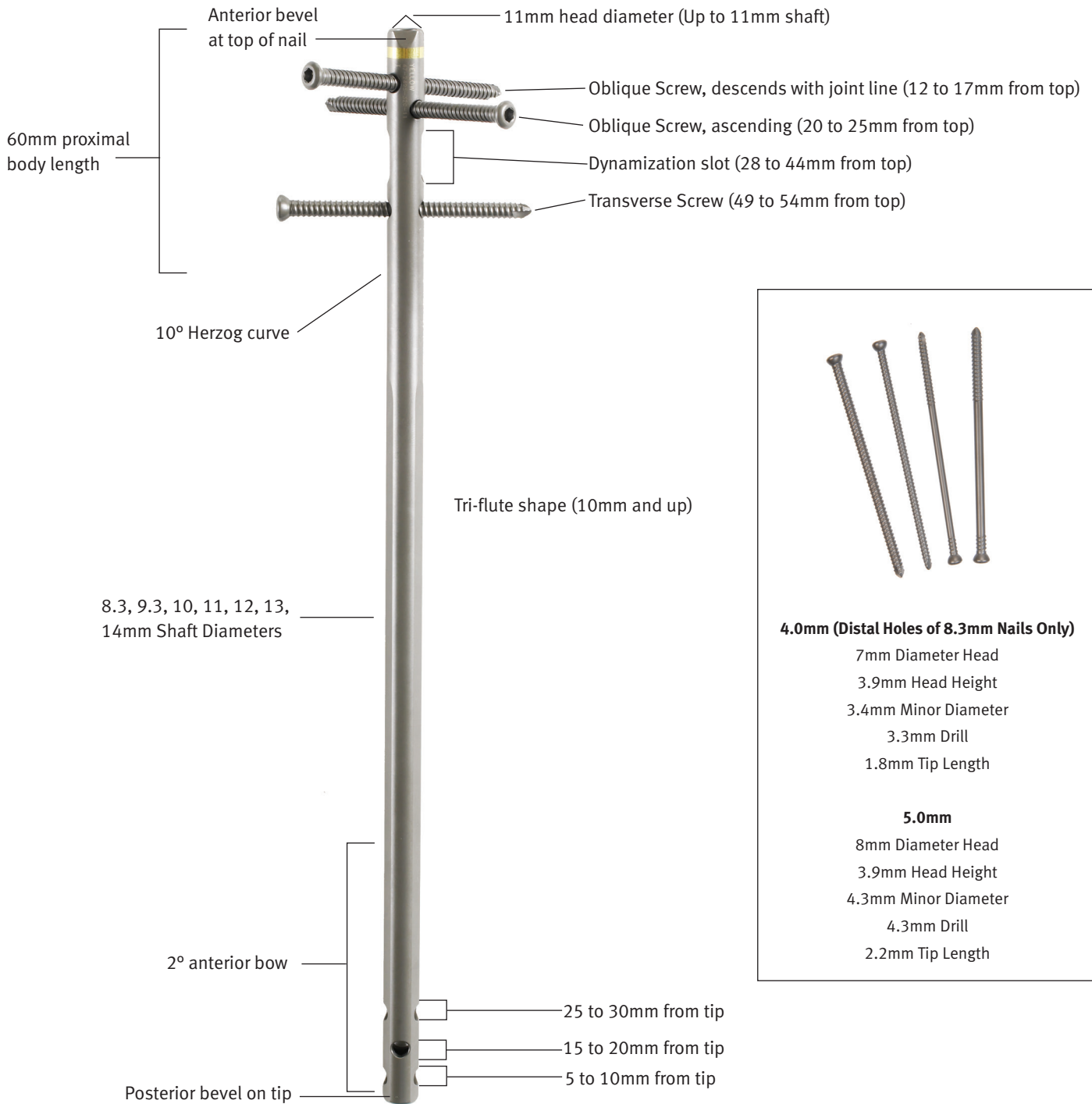
Use the C-arm to locate any distal screws. Remove the screws using a 3.5mm hex screwdriver. Remove the nail cap (if one was inserted) with the CONNECTING BOLT INSERTER or another Zimmer 5.0mm hex screwdriver. Expose the proximal screws and use a 3.5mm hex screwdriver to remove them.

Note: Use the specific captured screwdriver.

To remove the nail, slide a 2.0mm Guide Pin through the nail. Insert the CANNULATED EXTRACTION ADAPTER over the wire into the top of the nail. Tighten the adapter to the nail. Attach a slaphammer or other impaction device and impact to back out the nail.

*It is the responsibility of the surgeon to determine what is the most suitable postoperative care depending on each patient's health condition.

Tibial Nail Details



4.0mm (Distal Holes of 8.3mm Nails Only)

- 7mm Diameter Head
- 3.9mm Head Height
- 3.4mm Minor Diameter
- 3.3mm Drill
- 1.8mm Tip Length

5.0mm

- 8mm Diameter Head
- 3.9mm Head Height
- 4.3mm Minor Diameter
- 4.3mm Drill
- 2.2mm Tip Length

Case Examples



Pre-Op



Post-Op



Pre-Op



Post-Op

4.0mm Screws (Partially Threaded) (for distal screw holes on nails 8.3mm nail)

All Screws have a 3.5mm Hex Head

Item Number	Product Description
47-2483-020-40	4.0mm Cortical Screw 20mm Length
47-2483-022-40	4.0mm Cortical Screw 22.5mm Length
47-2483-025-40	4.0mm Cortical Screw 25mm Length
47-2483-027-40	4.0mm Cortical Screw 27.5mm Length
47-2483-030-40	4.0mm Cortical Screw 30mm Length
47-2483-032-40	4.0mm Cortical Screw 32.5mm Length
47-2483-035-40	4.0mm Cortical Screw 35mm Length
47-2483-037-40	4.0mm Cortical Screw 37.5mm Length
47-2483-040-40	4.0mm Cortical Screw 40mm Length
47-2483-042-40	4.0mm Cortical Screw 42.5mm Length
47-2483-045-40	4.0mm Cortical Screw 45mm Length
47-2483-047-40	4.0mm Cortical Screw 47.5mm Length
47-2483-050-40	4.0mm Cortical Screw 50mm Length
47-2483-052-40	4.0mm Cortical Screw 52.5mm Length
47-2483-055-40	4.0mm Cortical Screw 55mm Length
47-2483-057-40	4.0mm Cortical Screw 57.5mm Length
47-2483-060-40	4.0mm Cortical Screw 60mm Length
47-2483-065-40	4.0mm Cortical Screw 65mm Length
47-2483-070-40	4.0mm Cortical Screw 70mm Length
47-2483-075-40	4.0mm Cortical Screw 75mm Length
47-2483-080-40	4.0mm Cortical Screw 80mm Length
47-2483-085-40	4.0mm Cortical Screw 85mm Length
47-2483-090-40	4.0mm Cortical Screw 90mm Length
47-2483-095-40	4.0mm Cortical Screw 95mm Length
47-2483-100-40	4.0mm Cortical Screw 100mm Length

Fixed Angle (Fully Threaded)

Item Number	Product Description
47-2484-020-40	4.0mm Cortical Screw 20mm Length
47-2484-022-40	4.0mm Cortical Screw 22.5mm Length
47-2484-025-40	4.0mm Cortical Screw 25mm Length
47-2484-027-40	4.0mm Cortical Screw 27.5mm Length
47-2484-030-40	4.0mm Cortical Screw 30mm Length
47-2484-032-40	4.0mm Cortical Screw 32.5mm Length
47-2484-035-40	4.0mm Cortical Screw 35mm Length
47-2484-037-40	4.0mm Cortical Screw 37.5mm Length
47-2484-040-40	4.0mm Cortical Screw 40mm Length
47-2484-042-40	4.0mm Cortical Screw 42.5mm Length
47-2484-045-40	4.0mm Cortical Screw 45mm Length
47-2484-047-40	4.0mm Cortical Screw 47.5mm Length
47-2484-050-40	4.0mm Cortical Screw 50mm Length
47-2484-052-40	4.0mm Cortical Screw 52.5mm Length
47-2484-055-40	4.0mm Cortical Screw 55mm Length
47-2484-057-40	4.0mm Cortical Screw 57.5mm Length
47-2484-060-40	4.0mm Cortical Screw 60mm Length
47-2484-065-40	4.0mm Cortical Screw 65mm Length
47-2484-070-40	4.0mm Cortical Screw 70mm Length
47-2484-075-40	4.0mm Cortical Screw 75mm Length
47-2484-080-40	4.0mm Cortical Screw 80mm Length
47-2484-085-40	4.0mm Cortical Screw 85mm Length
47-2484-090-40	4.0mm Cortical Screw 90mm Length
47-2484-095-40	4.0mm Cortical Screw 95mm Length
47-2484-100-40	4.0mm Cortical Screw 100mm Length

5.0mm Screws (Partially Threaded)**(for all proximal screw holes and distal screw holes on nails 9.3mm and larger)**

Item Number	Product Description
47-2483-020-50	5.0mm Cortical Screw 20mm Length
47-2483-022-50	5.0mm Cortical Screw 22.5mm Length
47-2483-025-50	5.0mm Cortical Screw 25mm Length
47-2483-027-50	5.0mm Cortical Screw 27.5mm Length
47-2483-030-50	5.0mm Cortical Screw 30mm Length
47-2483-032-50	5.0mm Cortical Screw 32.5mm Length
47-2483-035-50	5.0mm Cortical Screw 35mm Length
47-2483-037-50	5.0mm Cortical Screw 37.5mm Length
47-2483-040-50	5.0mm Cortical Screw 40mm Length
47-2483-042-50	5.0mm Cortical Screw 42.5mm Length
47-2483-045-50	5.0mm Cortical Screw 45mm Length
47-2483-047-50	5.0mm Cortical Screw 47.5mm Length
47-2483-050-50	5.0mm Cortical Screw 50mm Length
47-2483-052-50	5.0mm Cortical Screw 52.5mm Length
47-2483-055-50	5.0mm Cortical Screw 55mm Length
47-2483-057-50	5.0mm Cortical Screw 57.5mm Length
47-2483-060-50	5.0mm Cortical Screw 60mm Length
47-2483-065-50	5.0mm Cortical Screw 65mm Length
47-2483-070-50	5.0mm Cortical Screw 70mm Length
47-2483-075-50	5.0mm Cortical Screw 75mm Length
47-2483-080-50	5.0mm Cortical Screw 80mm Length
47-2483-085-50	5.0mm Cortical Screw 85mm Length
47-2483-090-50	5.0mm Cortical Screw 90mm Length
47-2483-095-50	5.0mm Cortical Screw 95mm Length
47-2483-100-50	5.0mm Cortical Screw 100mm Length

Fixed Angle (Fully Threaded)

Item Number	Product Description
47-2484-020-50	5.0mm Cortical Screw 20mm Length
47-2484-022-50	5.0mm Cortical Screw 22.5mm Length
47-2484-025-50	5.0mm Cortical Screw 25mm Length
47-2484-027-50	5.0mm Cortical Screw 27.5mm Length
47-2484-030-50	5.0mm Cortical Screw 30mm Length
47-2484-032-50	5.0mm Cortical Screw 32.5mm Length
47-2484-035-50	5.0mm Cortical Screw 35mm Length
47-2484-037-50	5.0mm Cortical Screw 37.5mm Length
47-2484-040-50	5.0mm Cortical Screw 40mm Length
47-2484-042-50	5.0mm Cortical Screw 42.5mm Length
47-2484-045-50	5.0mm Cortical Screw 45mm Length
47-2484-047-50	5.0mm Cortical Screw 47.5mm Length
47-2484-050-50	5.0mm Cortical Screw 50mm Length
47-2484-052-50	5.0mm Cortical Screw 52.5mm Length
47-2484-055-50	5.0mm Cortical Screw 55mm Length
47-2484-057-50	5.0mm Cortical Screw 57.5mm Length
47-2484-060-50	5.0mm Cortical Screw 60mm Length
47-2484-065-50	5.0mm Cortical Screw 65mm Length
47-2484-070-50	5.0mm Cortical Screw 70mm Length
47-2484-075-50	5.0mm Cortical Screw 75mm Length
47-2484-080-50	5.0mm Cortical Screw 80mm Length
47-2484-085-50	5.0mm Cortical Screw 85mm Length
47-2484-090-50	5.0mm Cortical Screw 90mm Length
47-2484-095-50	5.0mm Cortical Screw 95mm Length
47-2484-100-50	5.0mm Cortical Screw 100mm Length

Nail Caps

Item Number	Product Description
47-2487-005-00	Tibial Nail Cap 0mm Height
47-2487-005-05	Tibial Nail Cap 5mm Height
47-2487-005-10	Tibial Nail Cap 10mm Height
47-2487-005-15	Tibial Nail Cap 15mm Height

Stainless steel implants are also available. For information please contact your Zimmer Sales Representative.

Instruments

KT-2490-005-00 – SMALL Tibia Nail Instrument Set

Item Number	Product Description
02.00020.049	Ratchet Wrench 11mm
00-2237-008-00	Skin Protector
00-2490-000-14	Connecting Knob
00-2490-000-30	Nail Diameter Gauge
00-2490-000-33	Ruler
00-2490-000-34	Nail Length Gauge
00-2490-000-41	Hole Indicator
00-2490-005-01	Small Tibial Connecting Bolt
00-2490-005-05	Tibial Module
00-2490-005-10	Tibial Targeting Guide Small Handle
00-2490-005-49	Tibial Axial Compression Device
00-2490-010-01	Short Cannulated Awl
00-2490-010-02	7mm Diameter Awl - Angled Tip
00-2490-012-00	Guide Wire Gripper
00-2490-014-80	Entry Reamer 8mm
00-2490-017-00	Guide Wire Pusher
00-2490-031-00	Connecting Bolt Inserter
00-2490-031-05	11mm Hex/ Pin Wrench
00-2490-032-00	Impaction Head
00-2490-032-01	Slotted Mallet
00-2490-033-00	Slap Hammer Adapter
00-2490-035-50	Modular Screwdriver 3.5mm Hex

00-2490-035-62	Short 3.5mm Hex Screwdriver - Captured
00-2490-035-72	Freehand 3.5mm Hex Screwdriver - Captured
00-2490-035-75	Freehand Modular 3.5mm Hex Screwdriver
00-2490-046-20	2.0mm Pin
00-2490-046-30	3.0mm Threaded Pin
00-2490-046-32	Guide Pin Inserter / Extractor
00-2490-050-00	Modular Handle AO
00-2490-050-02	Modular T-Handle
00-2490-051-80	Screw Cannula 8.0mm
00-2490-052-80	Screw Trocar 8.0mm
00-2490-053-43	Tibial Drill Sleeve 4.3mm
00-2490-054-43	Calibrated Drill 4.3mm Tibial
00-2490-065-80	Short Screw Depth Gauge 8.0mm
00-2490-070-00	Freehand Targeting Wand
00-2490-070-01	Targeting Wand Set Screw
00-2490-072-33	3.3mm Freehand Targeting Drill
00-2490-072-43	4.3mm Freehand Targeting Drill
00-2490-073-00	Freehand Targeting Depth Gauge
00-2490-074-00	Freehand Tissue Protection Sleeve
00-2490-080-00	Nail Cap Inserter
00-2490-080-03	Nail Cap Retaining Shaft
00-2490-090-00	Cannulated Extraction Adapter 5/16"
00-5900-099-00	Case Lid

KT-2490-005-01 – TALL Tibia Nail Instrument Set

Item Number	Product Description
02.00020.049	Ratchet Wrench 11mm
00-2237-008-00	Skin Protector
00-2490-000-14	Connecting Knob
00-2490-000-30	Nail Diameter Gauge
00-2490-000-33	Ruler
00-2490-000-34	Nail Length Gauge
00-2490-000-41	Hole Indicator
00-2490-005-05	Tibial Module
00-2490-005-07	Tall Tibial Connecting Bolt
00-2490-005-13	Tibia Targeting Guide Tall Handle
00-2490-005-49	Tibial Axial Compression Device
00-2490-010-01	Short Cannulated Awl
00-2490-010-02	7mm Diameter Awl - Angled Tip
00-2490-012-00	Guide Wire Gripper
00-2490-014-80	Entry Reamer 8mm
00-2490-017-00	Guide Wire Pusher
00-2490-031-00	Connecting Bolt Inserter
00-2490-031-05	11mm Hex / Pin Wrench
00-2490-032-00	Impaction Head
00-2490-032-01	Slotted Mallet
00-2490-033-00	Slap Hammer Adapter
00-2490-035-50	Modular Screwdriver 3.5mm Hex
00-2490-035-62	Short 3.5mm Hex Screwdriver - Captured
00-2490-035-72	Freehand 3.5mm Hex Screwdriver - Captured
00-2490-035-75	Freehand Modular 3.5mm Hex Screwdriver
00-2490-046-20	2.0mm Pin
00-2490-046-30	3.0mm Threaded Pin
00-2490-046-32	Guide Pin Inserter / Extractor
00-2490-050-00	Modular Handle AO
00-2490-050-02	Modular T-Handle

00-2490-051-80	Screw Cannula 8.0mm
00-2490-052-80	Screw Trocar 8.0mm
00-2490-053-43	Tibial Drill Sleeve 4.3mm
00-2490-054-43	Calibrated Drill 4.3mm Tibial
00-2490-065-80	Short Screw Depth Gauge 8.0mm
00-2490-070-00	Freehand Targeting Wand
00-2490-070-01	Targeting Wand Set Screw
00-2490-072-33	3.3mm Freehand Targeting Drill
00-2490-072-43	4.3mm Freehand Targeting Drill
00-2490-073-00	Freehand Targeting Depth Gauge
00-2490-074-00	Freehand Tissue Protection Sleeve
00-2490-080-00	Nail Cap Inserter
00-2490-080-03	Nail Cap Retaining Shaft
00-2490-090-00	Cannulated Extraction Adapter 5/16"
00-5900-099-00	Case Lid

Instrument Cases (Select both "Stainless Steel" or both "Stainless Steel and Aluminum" Cases)

Item Number	Product Description
00-2490-075-50	Tibial Case 1 of 2 – Stainless Steel and Aluminum
00-2490-079-50	Tibial Case 2 of 2 – Stainless Steel and Aluminum
00-2490-075-00	Tibial Case 1 of 2 – Stainless Steel
00-2490-079-00	Tibial Case 2 of 2 – Stainless Steel

Optional Instruments

Item Number	Product Description
00-2490-005-04	Tibial Module (Molded)
00-2490-014-12	Entry Reamer 12mm

Ball Tip Guide Wire (available separately)

Item Number	Product Description
00-2255-008-01	3.0mm Ball Tip Guide Wire 100cm
47-2255-008-01	3.0mm Ball Tip Guide Wire 100cm (Sterile)
00-2255-008-00	2.4mm Ball Tip Guide Wire 70cm
47-2255-008-00	2.4mm Ball Tip Guide Wire 70cm (Sterile)

Tear Drop Guide Wire (available separately)

Item Number	Product Description
47-2490-097-00	3.0mm x 100cm Tear Drop Guide Wire (Sterile)
47-2490-097-01	2.4mm x 100cm Tear Drop Guide Wire (Sterile)
47-2490-098-00	3.0mm x 70cm Tear Drop Guide Wire (Sterile)
47-2490-098-01	2.4mm x 70cm Tear Drop Guide Wire (Sterile)

KT-2490-020-00 – Reduction Instrument Set

Item Number	Product Description
00-2490-020-30	3.0mm Self Drilling Reduction Pin
00-2490-020-50	5.0mm Self Drilling Reduction Pin
00-2490-021-00	Ball Spike Pusher
00-2490-022-01	Bone Clamp
00-2490-022-02	Verbrugge Clamp
00-2490-022-03	Reduction Tong
00-2490-025-24	Bone Hook Small - 24mm
00-2490-025-34	Bone Hook Large - 34mm
00-2490-026-00	Reduction Rod
00-2490-050-00	Modular T-Handle AO
00-2490-060-50	Reduction Base and Tray
00-5900-099-00	Case Lid

Instrument Cases

Item Number	Product Description
00-2490-060-00	Reduction Case - Stainless Steel
00-2490-060-50	Reduction Case - Stainless Steel and Aluminum

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