

Titanium Proximal Tibial Plating System

Surgical Technique



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Titanium Proximal Tibia Plating System

Introduction

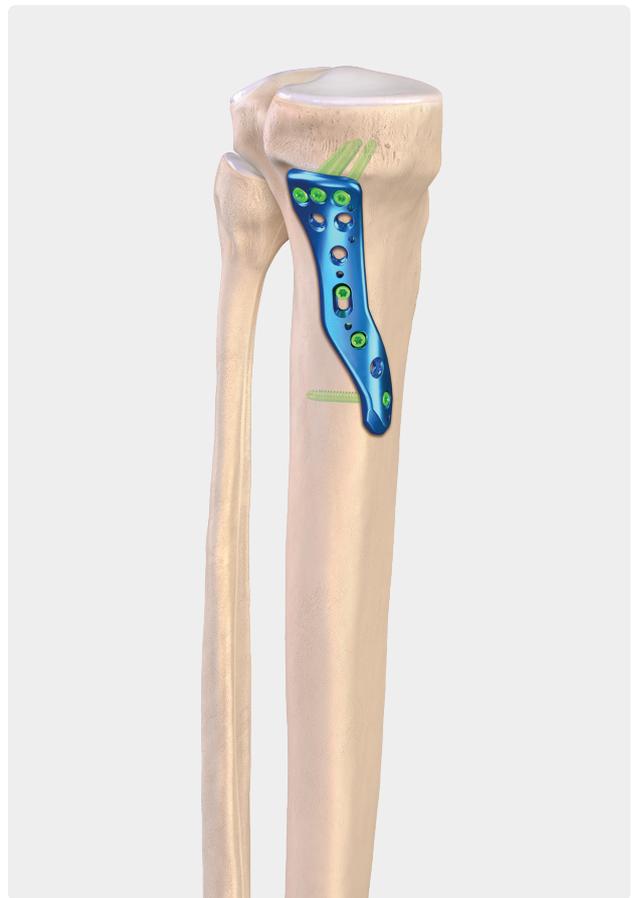
The **Titanium Proximal Tibia Plating System** builds on the Titanium Distal Tibia Plating System with the addition of lateral and posteromedial proximal tibia plating options, plateau-specific instruments, and longer screws. All plates accept 4.0 mm fixed-angle locking, 3.5 mm variable-angle locking (VAL), and 3.5 mm cortical screws. A T10 driver can be used for all screw sizes.

- › Titanium alloy plates and screws
- › Variable-angle capabilities in all holes
- › Snap-in guides save time when drilling nominal-angle screws
- › Variable-angle drill guide allows percutaneous screw insertion through the sleeve



Lateral Plate

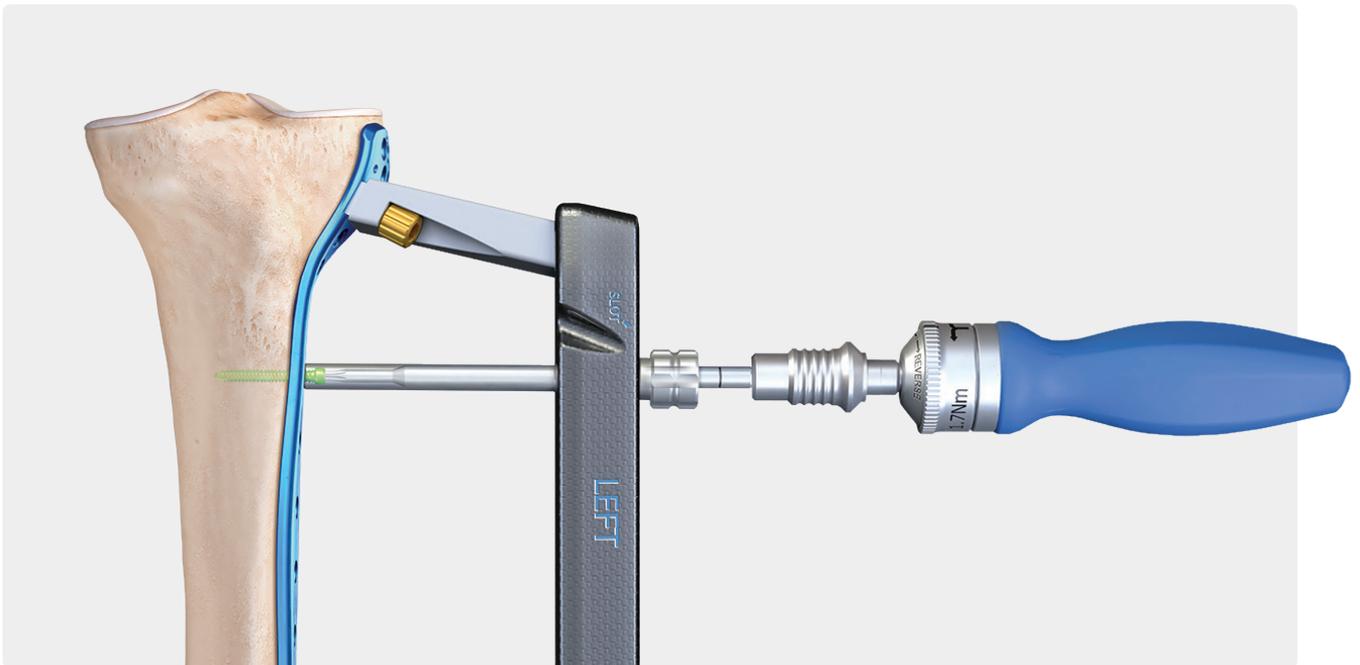
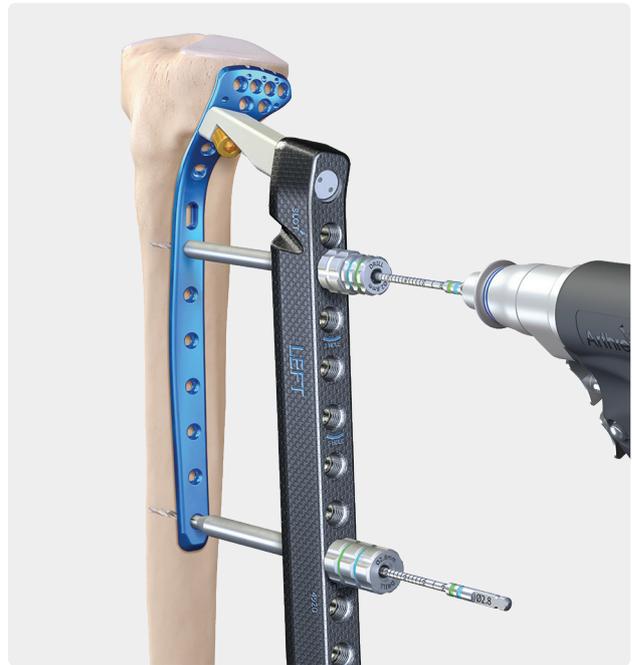
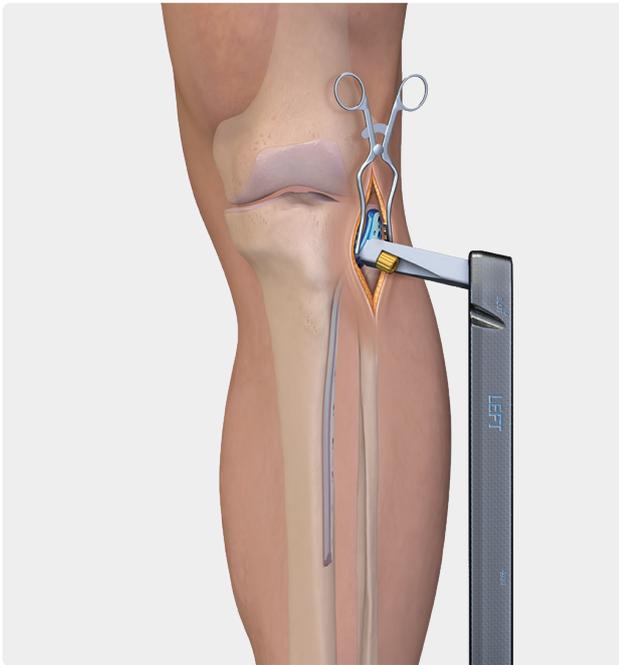
- › Percutaneous carbon fiber jig available for a minimally invasive technique
- › K-wire holes throughout the plate assist provisional placement and fracture reduction
- › Available in 2-, 3-, 5-, 8-, 11-, and 14-hole lengths



Posteromedial Plate

- › Plate wraps from posterior to medial and is designed to buttress posteromedial fragments
- › Sits distal to the semimembranosus tendon
- › Available in 4-, 5-, and 8-hole lengths

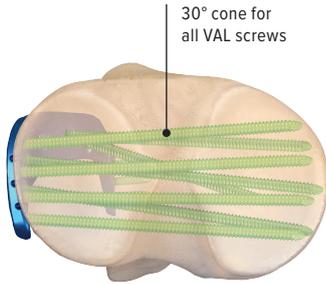
Percutaneous jig—Allows for a minimally invasive technique to address fractures versus a traditional open approach. The monoblock carbon fiber jig attaches to the plate with a single screw proximally, requiring a minimal incision. Distal fixation of the jig to the plate is achieved with a 2.8 mm drill bit, 1.5 mm guide pin, or distal alignment post. Calibrated drill bits and drivers facilitate quick implantation.



Indications

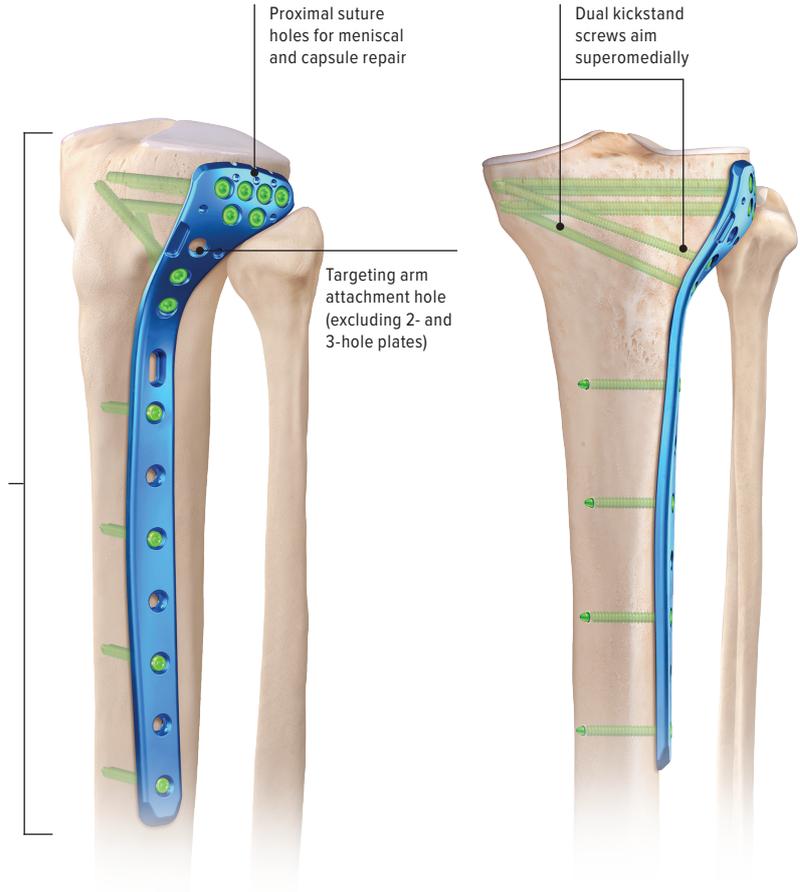
The Proximal Tibia Plating System is intended for the fixation of fractures, nonunions, malunions, osteopenic bone, and tibial osteotomies of the proximal tibia, including simple, comminuted, lateral wedge, depression, medial wedge, bicondylar combination of lateral wedge and depression, periprosthetic, and fractures with associated shaft fractures.

Lateral Plate Features



Supports multiple screw options

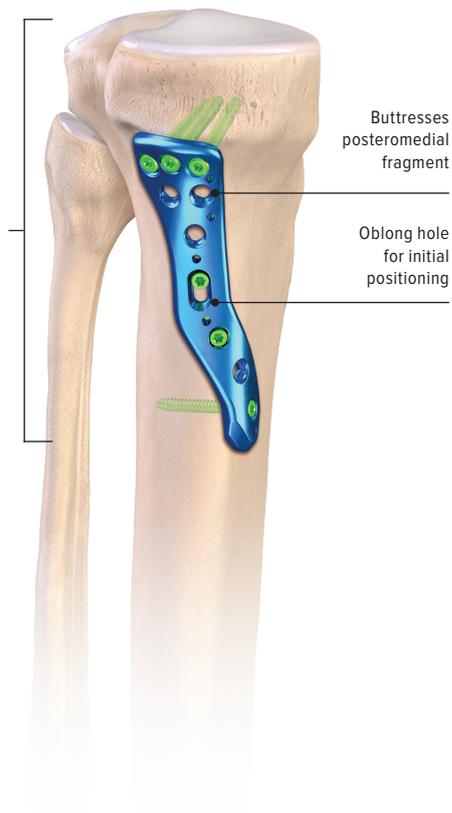
- > 4.0 mm fixed-angle locking screws
- > 3.5 mm VAL screws
- > 3.5 mm cortical screws



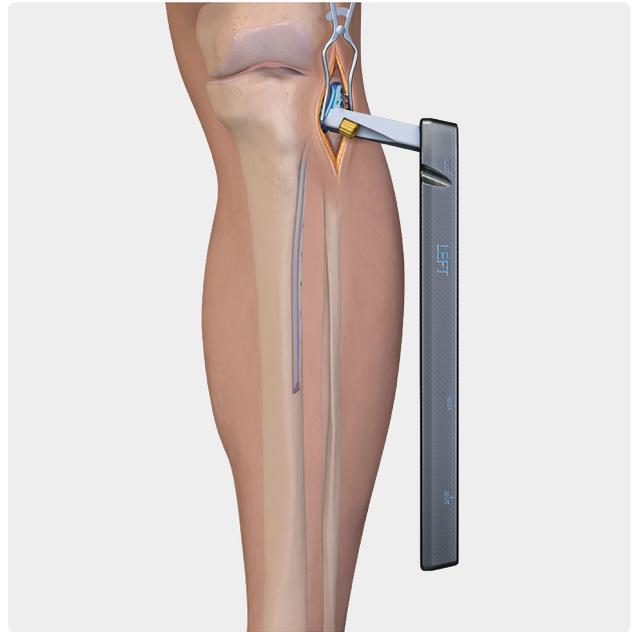
Posteromedial Plate Features

Supports multiple screw options

- > 4.0 mm fixed-angle locking screws
- > 3.5 mm VAL screws
- > 3.5 mm cortical screws



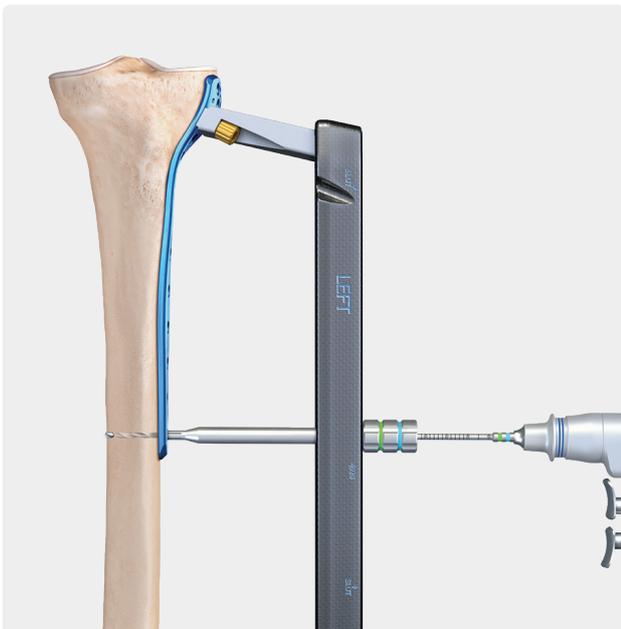
Percutaneous Technique for the Lateral Proximal Tibial Plate



01

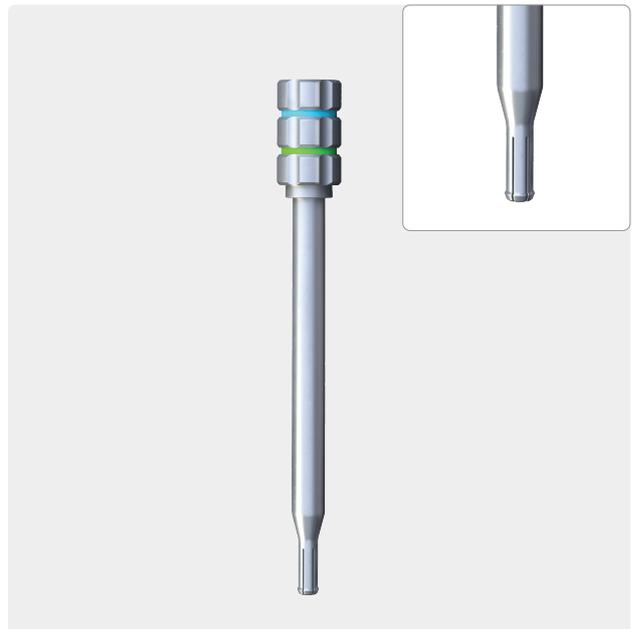
Select the desired length lateral proximal tibial plate and attach the targeting arm (4920 or 4921) with the attachment bolt (4916) using the 5.0 mm hex driver (5001) and screwdriver handle (5017). Insert the plate through the incision. The available soft-tissue elevator (0917) can be used to create a path for the plate.

There are three ways to distally fixate the jig and plate to the bone: a 2.8 mm drill bit, a 1.5 mm pin guide, or a distal alignment post.

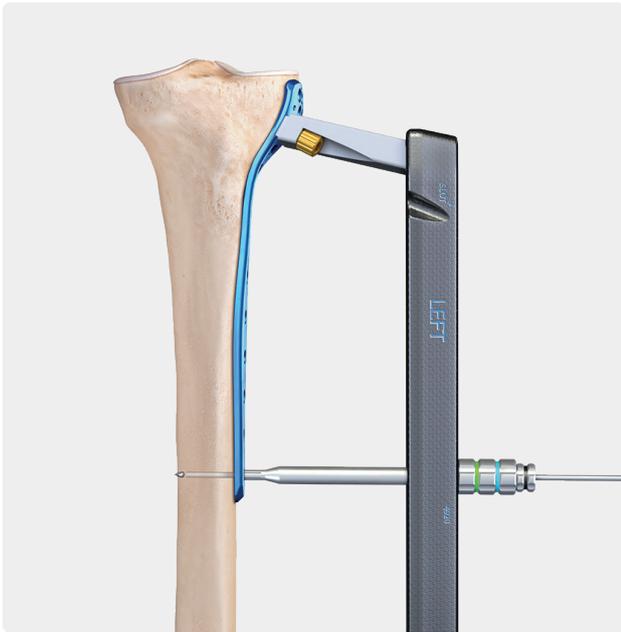


2a

2.8 mm drill bit—Position the plate on the bone using AP and lateral fluoroscopic imaging. Insert the targeter alignment lock/Ø2.8 mm drill guide (4914) through the targeting arm into the most distal hole of the plate.

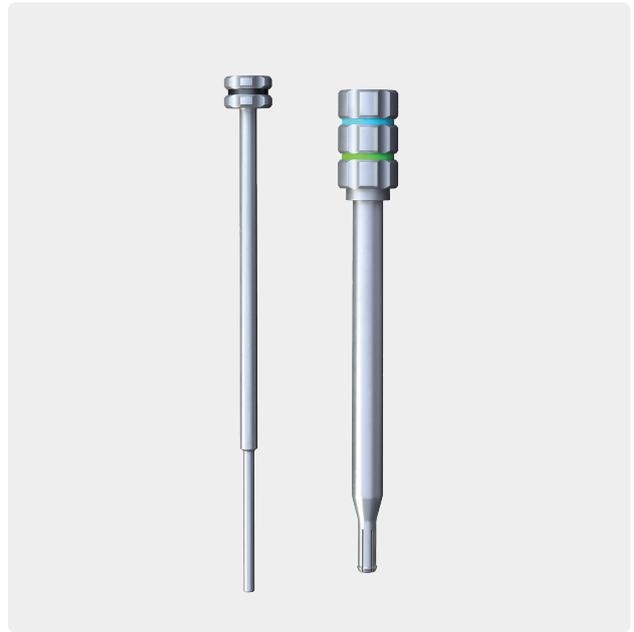


The tip should click into the plate, signifying proper engagement. Drill through the guide with the Ø2.8 mm distal calibrated drill (4040) bicortically and then disconnect the AO adapter and leave the drill bit in.



2b

1.5 mm pin guide—Position the plate on the bone using AP and lateral fluoroscopic imaging. Insert the targeter alignment lock/Ø2.8 mm drill guide (4914) through the targeting arm into the most distal hole of the plate. The tip should click into the plate, signifying proper engagement. Insert the targeter alignment lock/Ø1.5 mm pin guide (4915) through the targeter alignment lock/Ø2.8 mm drill guide.



Insert a 1.5 mm × 230 mm guidewire (0109-230) bicortically to provisionally fixate the plate distally.

Note: The Ø2.8 mm drill guide and Ø1.5 mm pin guide cannot be inserted into the plate together because the Ø1.5 mm pin guide prevents the locking tip from collapsing. The Ø2.8 mm drill guide must be snapped into the plate first.

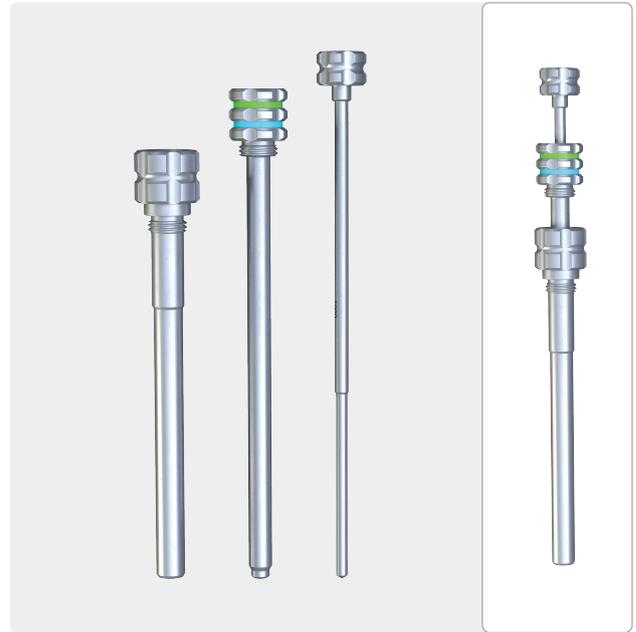
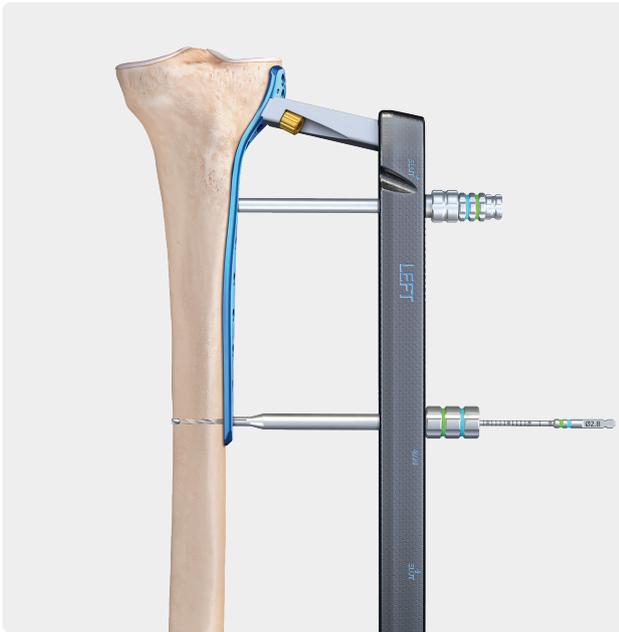


2c

Distal alignment post—Position the plate on the bone using AP and lateral fluoroscopic imaging. Insert the targeting arm distal alignment post (4918) through the targeting arm into the most distal hole of the plate. The tip should click into the plate, signifying proper engagement.

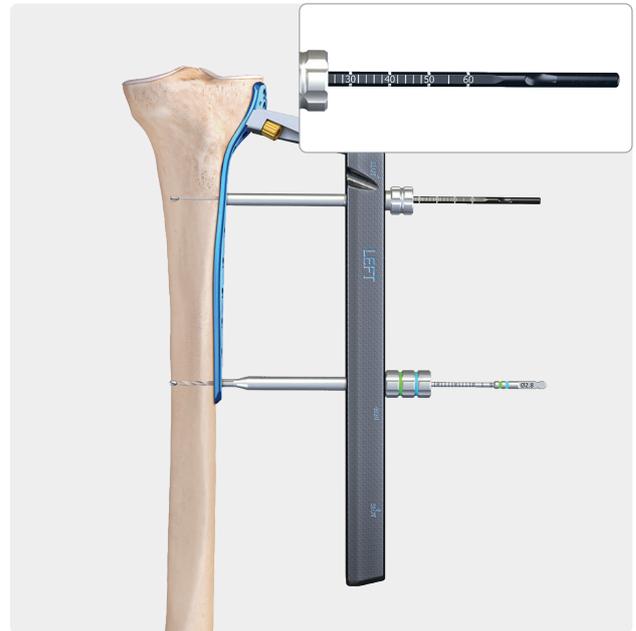


Insert the targeting arm distal alignment lock (4919) through the targeting arm distal alignment post to align the jig with the plate. This method does not fixate the construct to the bone. Another guide pin or screw is required to provide fixation in another hole.



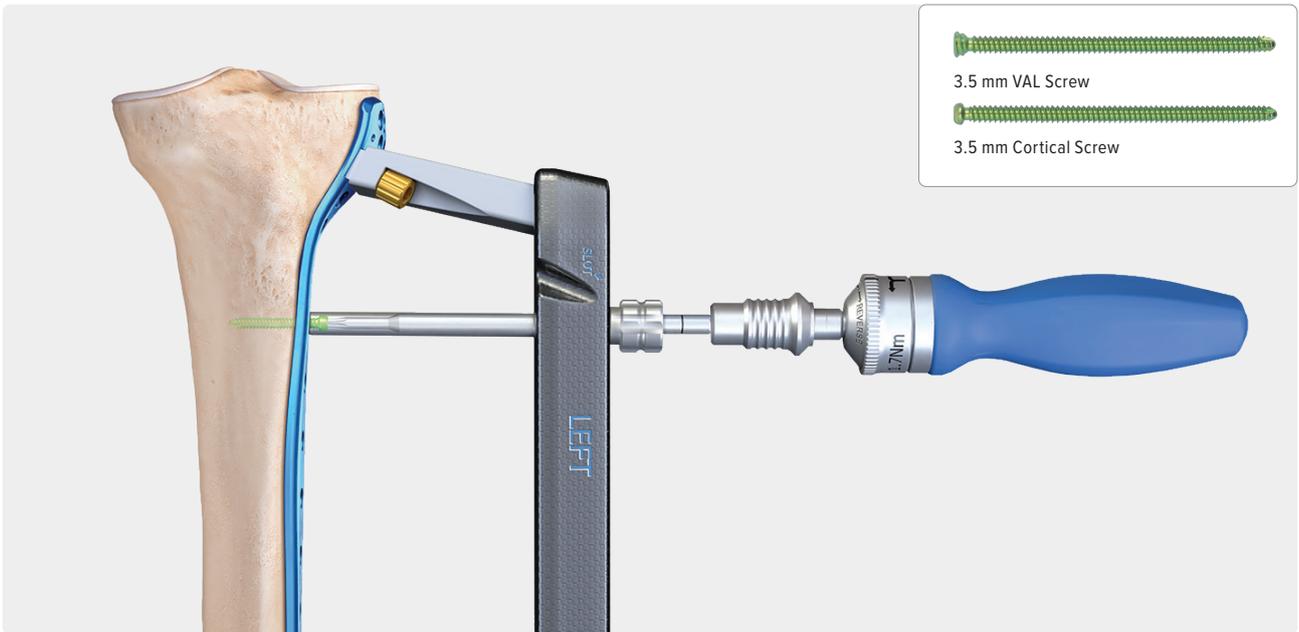
03

Distal shaft screws—Pin the plate to the bone proximally with a 1.5 mm nonthreaded guide pin (0109-150). Assemble the targeting screw sheath (0660), Ø2.8 mm targeting drill guide (0380), and targeting arm obturator (0661). Position into the desired hole of the targeting arm. Screw the drill guide assembly into the targeting arm.



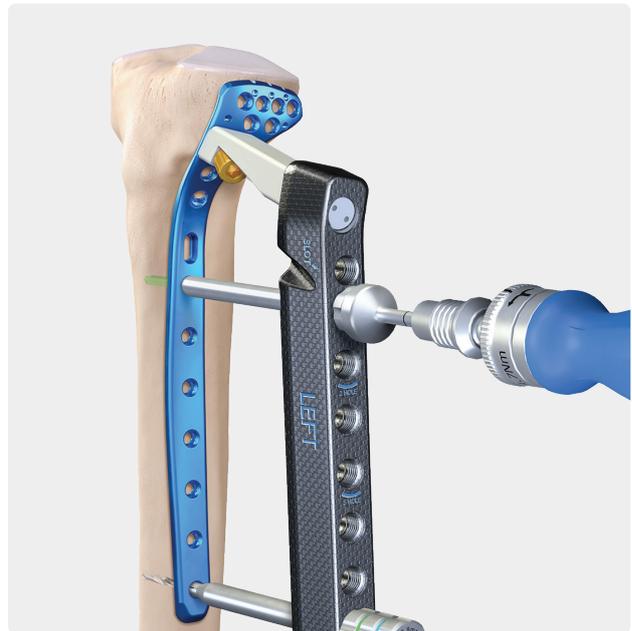
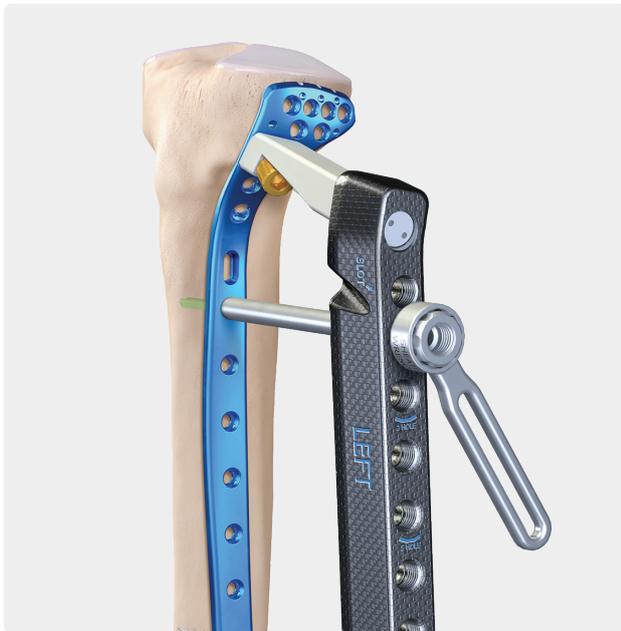
04

Remove the targeting arm obturator and then drill through the Ø2.8 mm targeting drill guide with the Ø2.8 mm distal calibrated drill (4040). The screw length needed can be read off the calibrated drill bit or measured with the screw sheath depth gauge (0552) after removal of the Ø2.8 mm targeting drill guide.



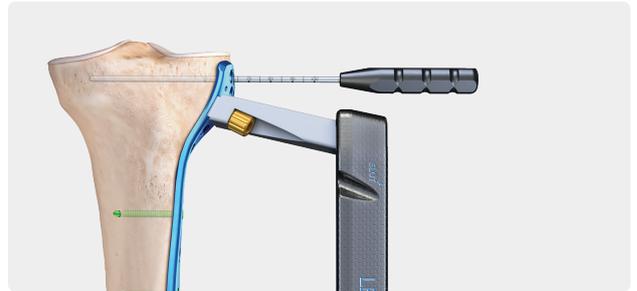
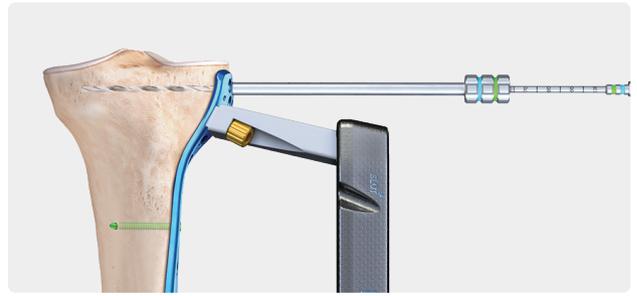
05

Choose either a 3.5 mm cortical screw or 3.5 mm VAL screw and implant with the T10 driver (5042) on the AO ratcheting torque-limiting handle (5027), screwdriver handle (5017), or AO power torque-limiting adapter (5023) through the targeting screw sheath. The laser mark on the driver will indicate when the screw is down to the plate.



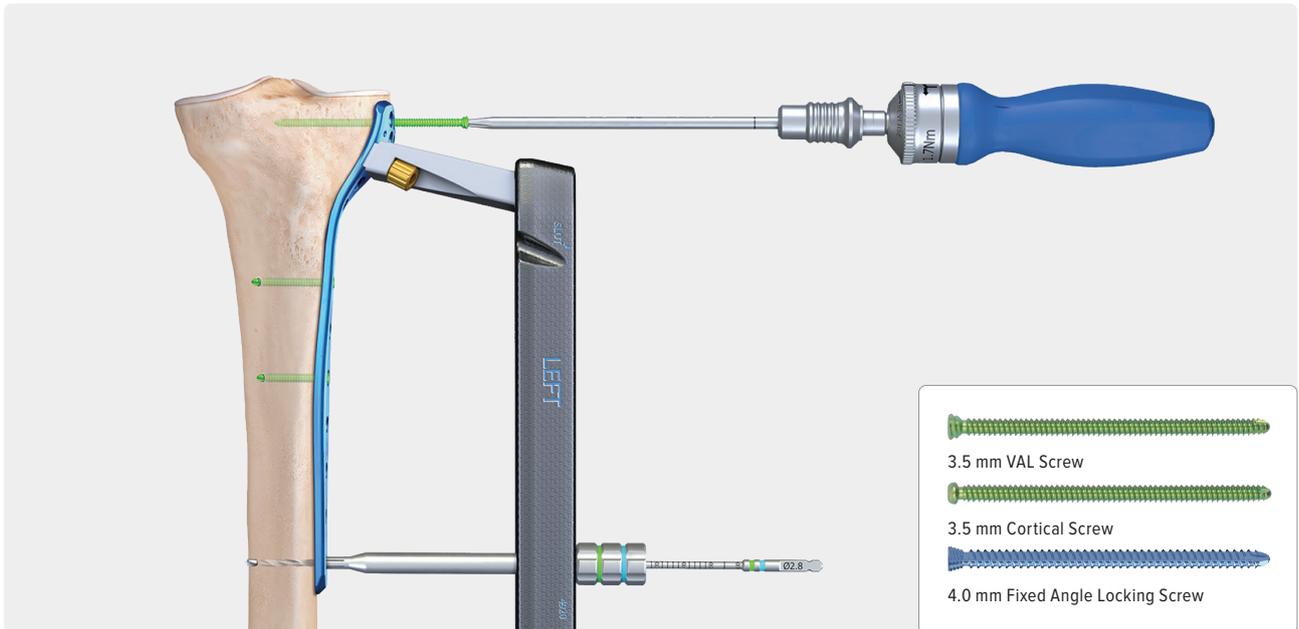
06

The sheath driver (5044) or sheath wrench (5040) can be used to remove targeting screw sheaths if needed.



07

Proximal screws outside of the target arm—Screw the fixed-angle drill guide (0381) into a screw hole and drill with the Ø2.8 mm proximal calibrated drill (4032) through the drill guide. The screw length needed can be read off the calibrated drill bit or measured with the unicortical depth gauge (0553) after removal of the drill guide.



08

Choose either a 3.5 mm cortical screw, 3.5 mm VAL screw, or 4.0 mm fixed-angle locking screw and implant with the T10 driver (5042) on the AO ratcheting torque-limiting handle (5027), screwdriver handle (5017), or AO power torque-limiting adapter (5023). Remove the 1.5 mm guidewire if needed.



09

Add additional screws as needed. Remove the targeting arm from the plate with the 5.0 mm hex driver. It is recommended to final tighten all screws once more using the torque-limiting driver to ensure proper fixation.

Open Technique for the Posteromedial or Lateral Plate

The following general technique can be used for the lateral plate as well.



01

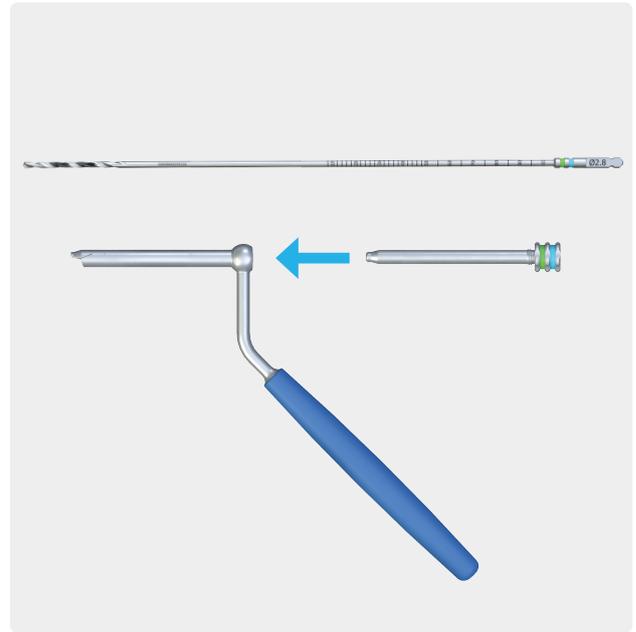
Select the desired length proximal medial plate. The plate is designed to sit distal to the insertion of the semimembranosus tendon. Pin the plate to the bone with 1.5 mm nonthreaded guide pins (0109-150).



02

Variable-angle drill guide for 3.5 mm cortical or 3.5 mm VAL screws—Screw the 2.8 mm drill guide (0349) into the screw sheath (0643). The assembled drill guide can be used for the 3.5 mm cortical or 3.5 mm VAL screws.

The tip of the drill guide will slip out of the hole when beyond the 30° variable-angle locking cone. Drill through the guide with the Ø2.8 mm drill (4009) and use the calibrations to determine screw length (up to 60 mm). A hook tip depth gauge (0543) or large hook tip depth gauge (0550) can be used.



For screws longer than 60 mm, the 2.8 mm proximal (4032) or distal (4040) drill bits with the large hook tip depth gauge (0550) should be used. These drill bits are not calibrated to the 2.8 mm drill guide (0349).

Note: Do not drill when the drill guide is at an angle greater than 15° in any direction as this may cause the selected VAL screw to not fully seat in the plate screw hole.



03

Choose either a 3.5 mm cortical screw or 3.5 mm VAL screw and implant with a T10 driver on the AO ratcheting torque-limiting handle (5027), screwdriver handle (5017), or AO power torque-limiting adapter (5023).

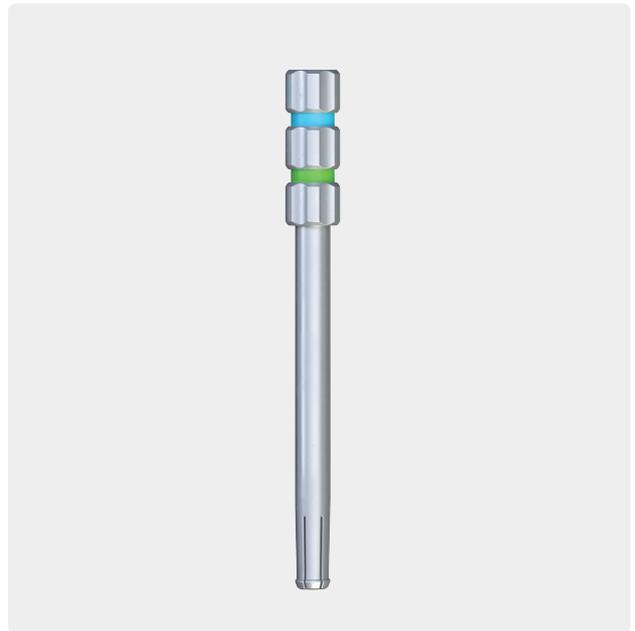


Note: The screw can also be implanted through the screw sheath if using the T10 driver (5015-300) as shown above. Before the screw is fully seated, the screw sheath should be pulled back so it does not get stuck between the screw head and the plate.

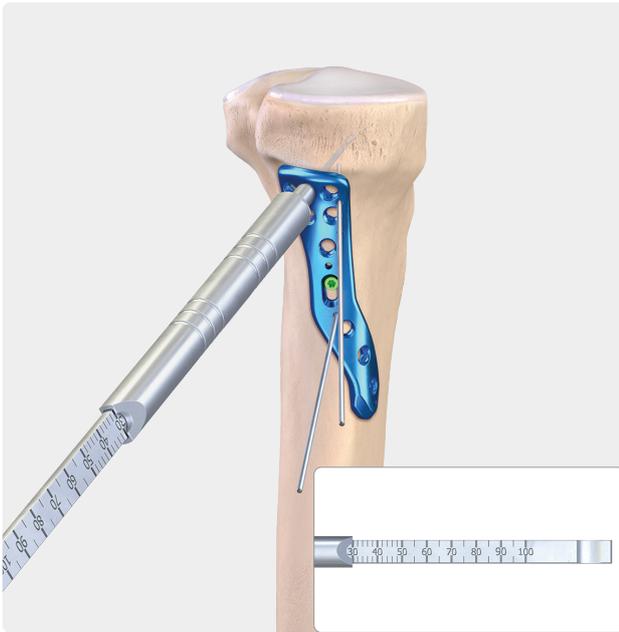


04

The 2.8 mm snap-in drill guide (0352) can be used for the 4.0 mm fixed-angle locking screws, 3.5 mm cortical screws, or 3.5 mm VAL screws. Drill through the guide with the Ø2.8 mm drill (4009) and use the calibrations to determine screw length (up to 60 mm).



Note: For screws longer than 60 mm, the 2.8 mm proximal (4032) or distal (4040) drill bits with the large hook tip depth gauge (0550) should be used. These drill bits are not calibrated to the 2.8 mm snap-in drill guide (0352).



05

Alternatively, a hook tip depth gauge (0543) or large hook tip depth gauge (0550) can be used to determine screw length.



06

Choose either a 3.5 mm cortical screw, 3.5 mm VAL screw, or 4.0 mm fixed-angle locking screw, and implant with a T10 driver on the AO ratcheting torque-limiting handle (5027), screwdriver handle (5017), or AO power torque-limiting adapter (5023).

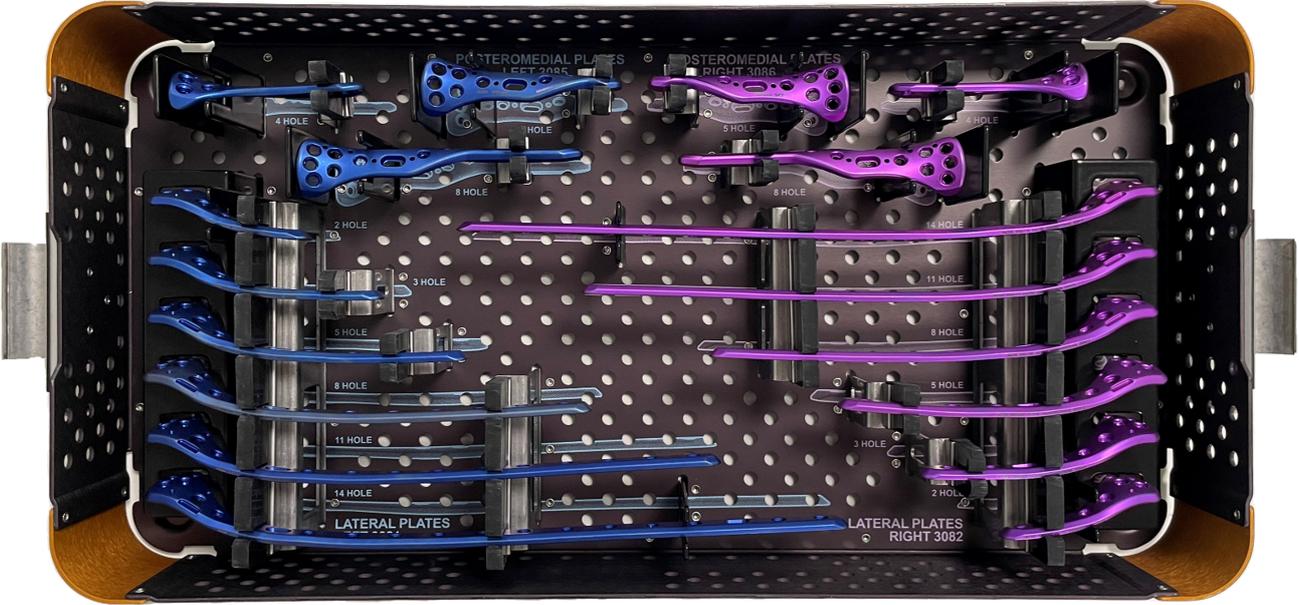


07

Add additional screws as needed and remove the 1.5 mm guide pins. It is recommended to final tighten all screws once more using the torque-limiting driver to ensure proper fixation.

Tray Layout

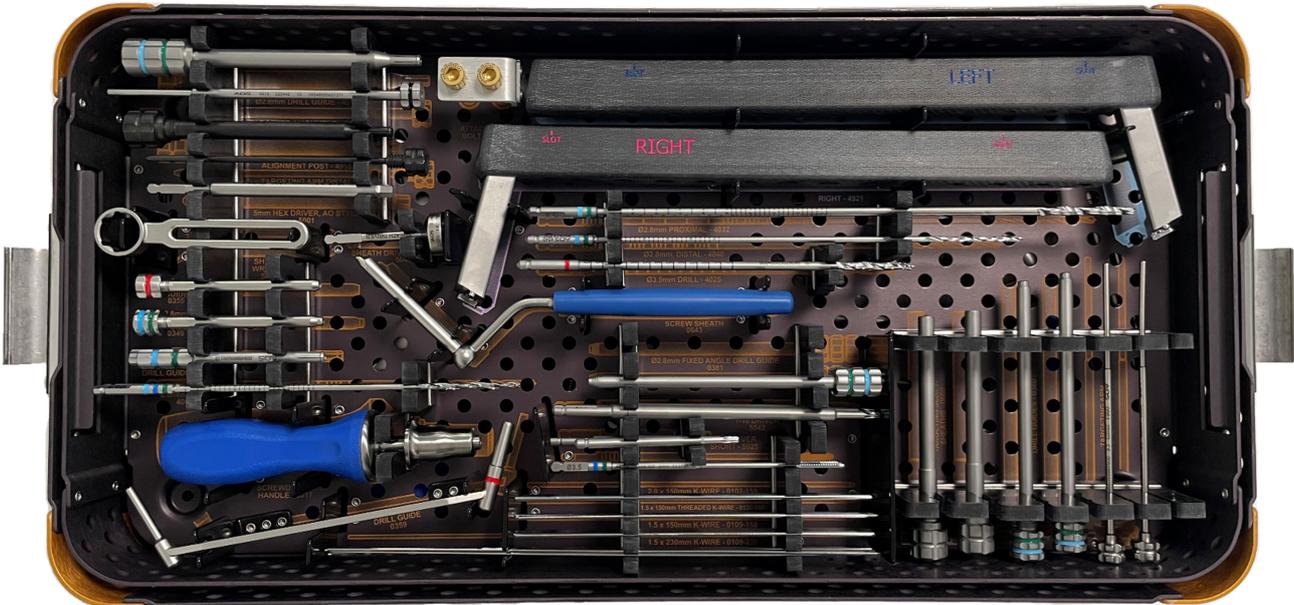
1. Titanium Proximal Tibia Plate Tray (9955-000)



2. Titanium Proximal Tibia Screw Caddy (9957-100)



3a. Titanium Proximal Tibial Instrument Tray—Top Layer, 9956-100



3b. Titanium Proximal Tibial Instrument Tray—Bottom Layer, 9956-100



Ordering Information

Titanium Proximal Tibia Plates

Proximal Lateral Tibia Plate, left, 2-hole	3081-102
Proximal Lateral Tibia Plate, left, 3-hole	3081-103
Proximal Lateral Tibia Plate, left, 5-hole	3081-105
Proximal Lateral Tibia Plate, left, 8-hole	3081-108
Proximal Lateral Tibia Plate, left, 11-hole	3081-111
Proximal Lateral Tibia Plate, left, 14-hole	3081-114
Proximal Lateral Tibia Plate, right, 2-hole	3082-102
Proximal Lateral Tibia Plate, right, 3-hole	3082-103
Proximal Lateral Tibia Plate, right, 5-hole	3082-105
Proximal Lateral Tibia Plate, right, 8-hole	3082-108
Proximal Lateral Tibia Plate, right, 11-hole	3082-111
Proximal Lateral Tibia Plate, right, 14-hole	3082-114
Proximal Posteromedial Tibia Plate, left, 4-hole	3085-004
Proximal Posteromedial Tibia Plate, left, 5-hole	3085-005
Proximal Posteromedial Tibia Plate, left, 8-hole	3085-008
Proximal Posteromedial Tibia Plate, right, 4-hole	3086-004
Proximal Posteromedial Tibia Plate, right, 5-hole	3086-005
Proximal Posteromedial Tibia Plate, right, 8-hole	3086-008

Instruments

Proximal Tibial Plate Tray	9955-000
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Titanium Proximal Tibia Screws

Fixed-Angle Locking Screw, 4.0 mm × 10 mm-38 mm (2 mm increments)	8094-010-038
Cortical Screw, 3.5 mm × 20 mm-100 mm (2 mm increments)	8100-020-100
VAL Screw, 3.5 mm × 65 mm-100 mm (5 mm increments)	8088-065-100

Instruments

Titanium Proximal Tibial Screw Caddy	9957-000
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Titanium Proximal Tibia Instruments and Disposables

Instruments	
Targeting Drill Guide, Ø2.8 mm	0380-000
Fixed-Angle Drill Guide, Ø2.8 mm	0381-000
Hook Tip Depth Gauge	0550-000
Screw Sheath Depth Gauge	0552-000
Unicortical Depth Gauge	0553-000
Targeting Screw Sheath	0660-000
Targeting Arm Obturator	0661-000
King Tong Forceps	0916-000
Soft Tissue Elevator	0917-000
Reduction Forceps	0918-000
Attachment Bolt	4916-000
Drill Guide, targeter alignment lock, 2.8 mm	4914-000
Pin Guide, targeter alignment lock, 1.5 mm	4915-000
Targeting Arm Distal Alignment Post	4918-000
Targeting Arm Distal Alignment Lock	4919-000
Targeting Arm, proximal, tibia plate, small bend, left	4920-000
Targeting Arm, proximal, tibia plate, small bend, right	4921-000
Driver, hex, AO, 5 mm	5001-000
Driver, capturing, T10	5042-000
Wrench, targeter sheath	5040-000
Driver, targeter sheath	5044-000
Drill Guide, 2.8 mm	0349-100
Drill Guide, snap-in, 2.8 mm	0352-100
Drill Guide, 3.5 mm	0355-000
Drill Guide, 2.8 mm/3.5 mm	0359-000
Screw Sheath	0643-000
Fixed Small Axial Handle, AO quick connect	5017-100
Power Torque-Limiting Adapter, AO, 1.7 mm	5023-000
Screwdriver, T10, captured, short	5025-100
Ratcheting Torque-Limiting Handle, AO, 1.7 mm	5027-000
Titanium Proximal Tibial Instrument Tray	9956-000
Disposables	
Guide Pin, nonthreaded, 1.5 mm × 230 mm	0109-230
Guidewire, trocar tip, Ø1.5 mm × 150 mm	0109-150
Guidewire, fast threaded, Ø1.5 mm × 150 mm	0120-150
Guidewire, trocar tip, Ø2.0 mm × 150 mm	0102-150
Drill, calibrated, distal, 2.8 mm	4032-000
Drill, calibrated, proximal, 2.8 mm	4040-000
Drill, 2.8 mm	4009-100
Tap, cortical, AO, 3.5 mm	4024-100
Drill, 3.5 mm	4025-000

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US patent information