

SURGICAL TECHNIQUE GUIDE

DISTAL ELBOW SET **proximal ulna plate**



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DISTAL ELBOW SET

proximal ulna plate

Indications for Use

The proximal ulna plates are intended for fixation of fractures, fusions, osteotomies and non unions of the ulna, particularly in osteopenic bone.



Please refer to the Distal Elbow Plating Set Instructions for Use to review the warnings, precautions and contraindications for this system.

SUPERFICIAL EXPOSURE

1



With the elbow flexed 90°, make a posterior incision extending distally, curving around the olecranon and over the subcutaneous border of the ulna.

NOTE:

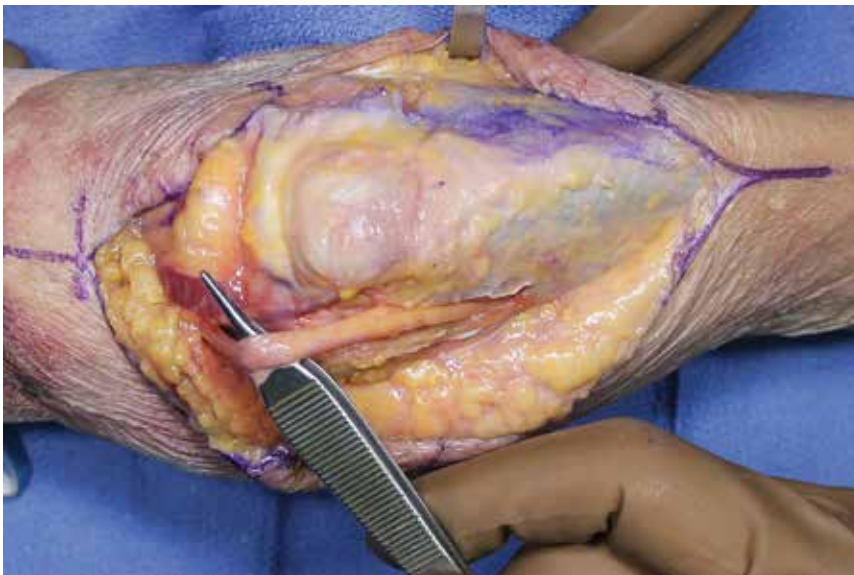
The incision can be curved slightly lateral or medial to the tip of the olecranon based on your preferred method.

Warning:

Take care to avoid injury to the ulnar nerve.

RELEASING THE ULNAR NERVE

2



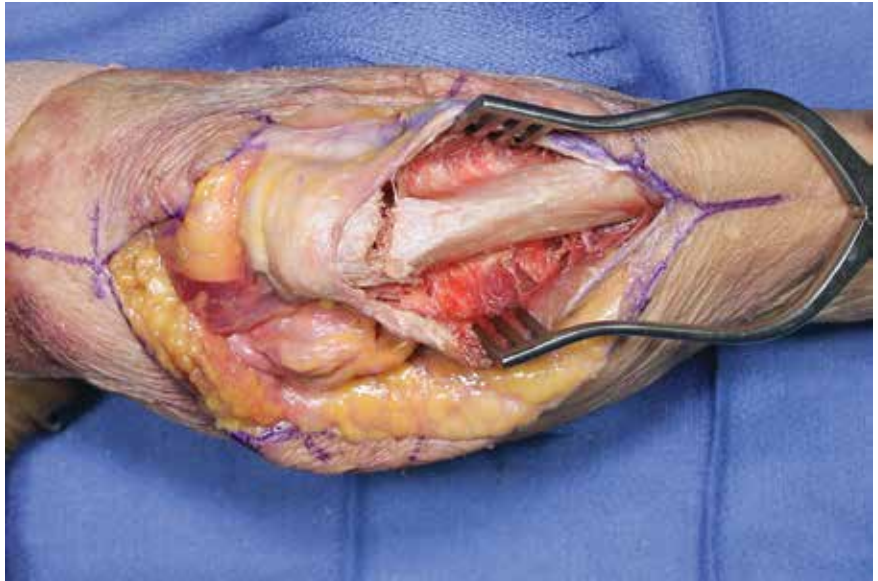
Locate the ulnar nerve.

Release and protect the nerve, considering the possibility of transposition.

3

DEEP EXPOSURE

Expose the proximal ulna sub-periosteally.

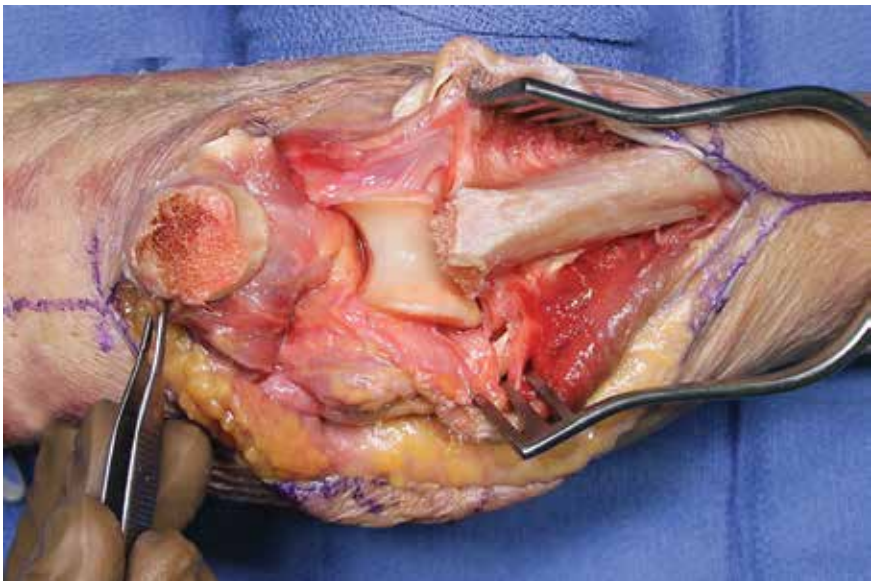


4

ACCESSING THE JOINT

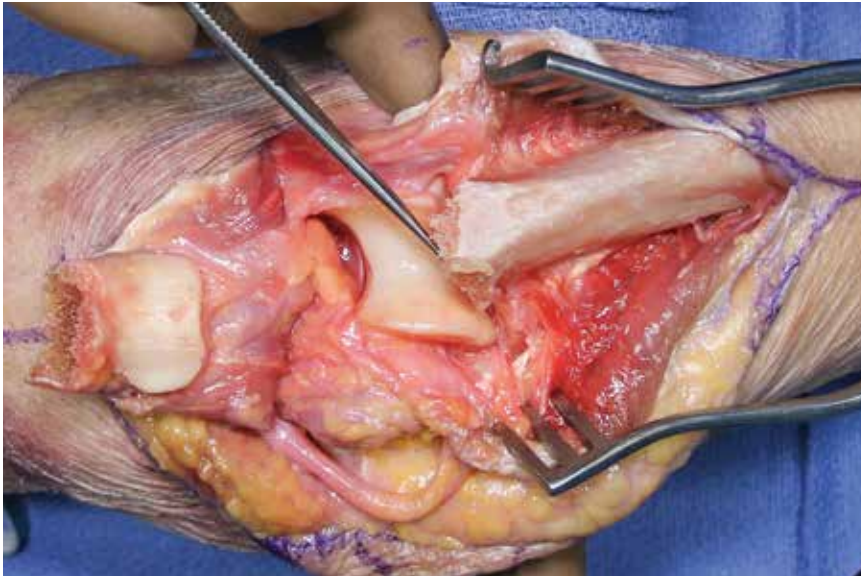
For olecranon fractures, enter the joint through the fracture plane by releasing the capsular attachments on the proximal fragment as needed.

The articular surfaces can be evaluated at this time.



DEBRIDING THE FRACTURE

5



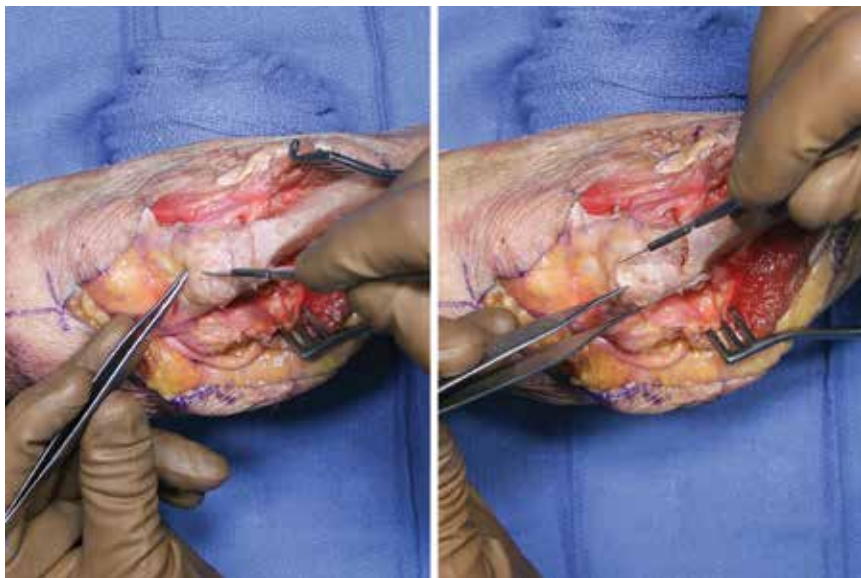
Debride the fracture site.

NOTE:

It is necessary to remove callus, clot and fibrous tissue in order to achieve a proper reduction.

DISTAL TRICEPS RELEASE

6



Starting distal to proximal, split the triceps insertion longitudinally for approximately 1 cm.

Elevate the triceps along a narrow longitudinal strip to provide space for the "Home Run" (HR) tab.

7

PLATE SELECTION

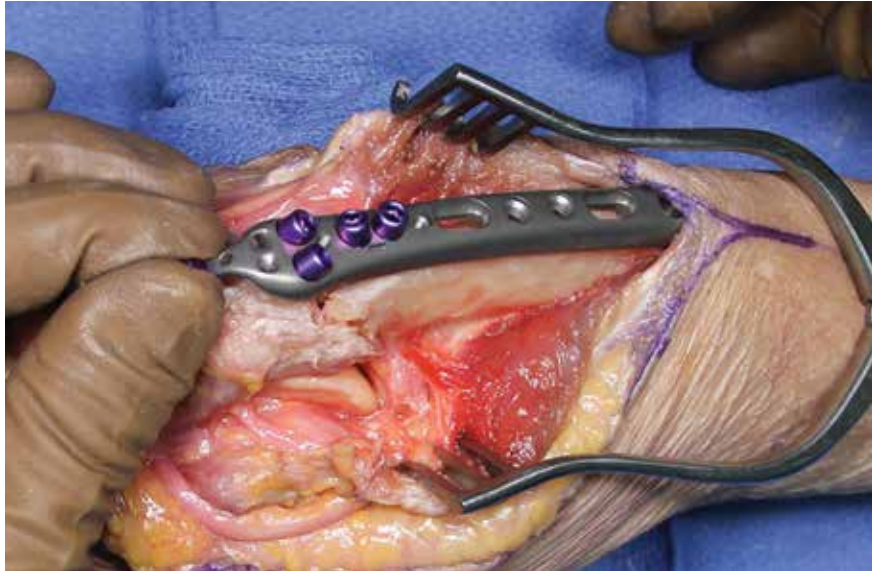
Select the appropriate length of plate that provides at least six cortices of fixation distal to the fracture line.

NOTE:

The shaft of the 151mm length plate can be bent using the Bending Irons. If plate bending is necessary, please refer to step 29 in this surgical technique guide.

WARNING:

Bending may weaken or break the plate. Be sure to inspect the plate for damage prior to use.

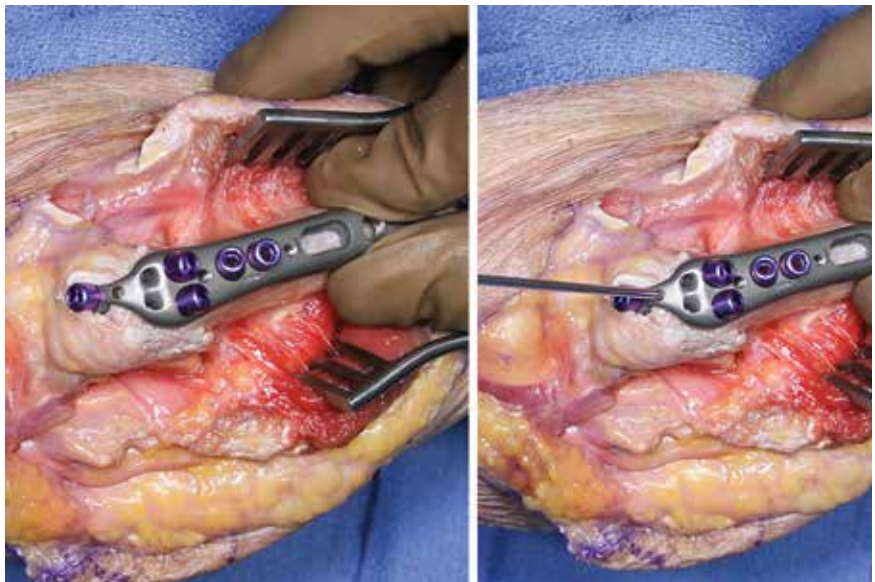


8

PROVISIONAL PLATE FIXATION

Apply the plate to the proximal fragment confirming that the plate is centered on the ulna shaft and that the HR tab is flush to the olecranon.

Secure the plate to the proximal fragment using a 2mm K-wire through the hole at the base of the HR tab.



K-wire, 2.0mm

FRACTURE REDUCTION

9



Reduce the fracture by levering the shaft of the plate to the distal fragment.

Confirm fracture reduction and plate alignment using fluoroscopy.

DISTAL FRAGMENT FIXATION

10

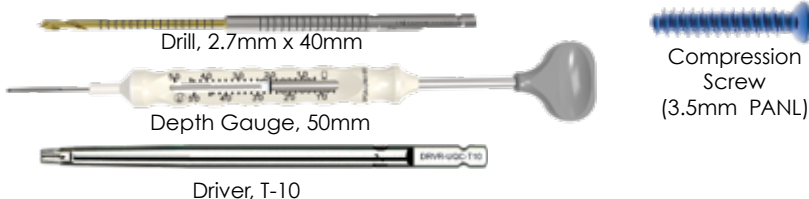


Using the 2.7mm x 40mm bit, drill bicortical through the distal end of an oblong hole that is distal to the fracture line. This will allow for dynamic compression of the fracture.

Measure screw length using the appropriate scale on the 50mm Depth Gauge, then insert a 3.5mm compression screw (PANL series) using the T-10 Driver while applying interfragmentary compression.

NOTE:

The depth gauge has a dual scale to reflect measurements through the PDG's (top scale) or directly through the plate (bottom scale).



Drill, 2.7mm x 40mm

Depth Gauge, 50mm

Driver, T-10

Compression
Screw
(3.5mm PANL)

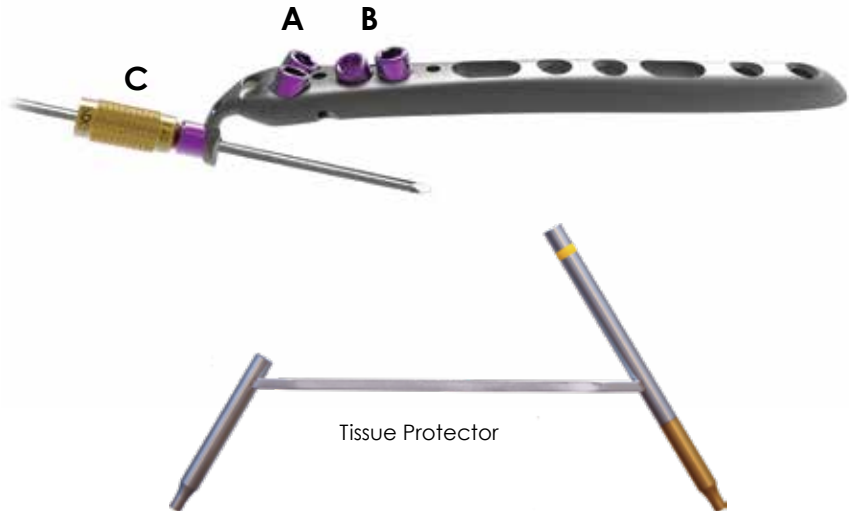
11

PROXIMAL FIXATION OPTIONS

The two proximal holes containing PDG's are for fixation to the olecranon (**A**). The adjacent two distal holes containing PDG's are for fixation to the coronoid (**B**). All of the PDG's can accept an A.I.M.ing Guide 2.0 (**C**) if provisional K-wire fixation is necessary using 2.0mm K-wires.

If it is necessary to vary a screw trajectory, remove the PDG and drill free-hand. A tissue protector is provided in the system.

If a 3.0mm Cannulated Polyaxial Locking Screw (PLS) is needed, please refer to steps 22 through 25 in this surgical technique guide.

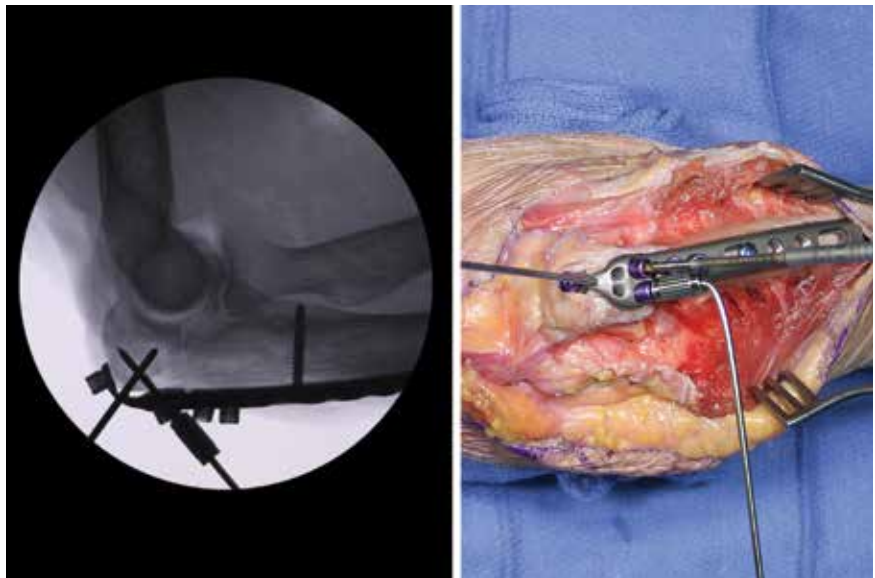


12

PROVISIONAL K-WIRE FIXATION

If provisional plate fixation is needed, insert an A.I.M.ing Guide 2.0 into the desired PDG, then drive a 2.0mm K-wire through the A.I.M.ing Guide taking care to avoid the articular surfaces of the joint.

Using the 2.7mm bit, drill through the PDG. If a K-wire obstructs drilling, bend it out of the way.



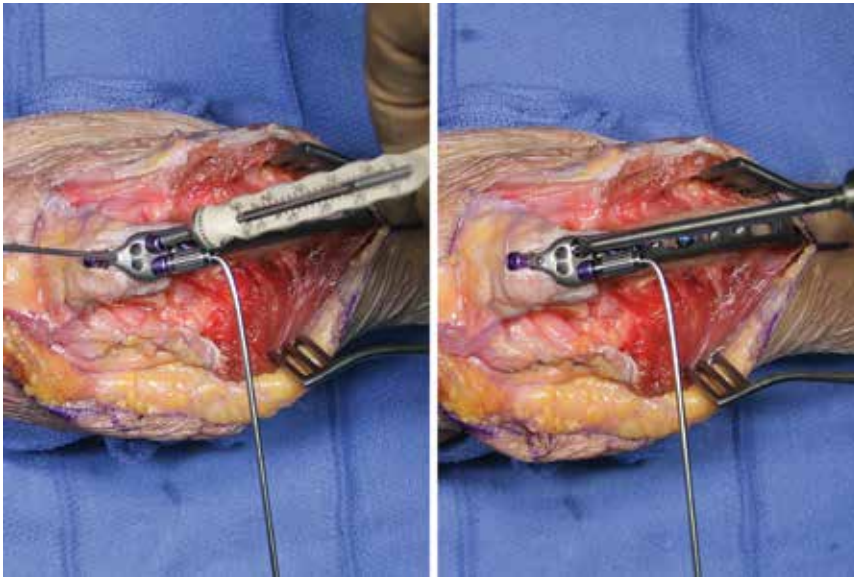
A.I.M.ing Guide, 2.0mm



K-wire, 2.0mm

OLECRANON FIXATION

13



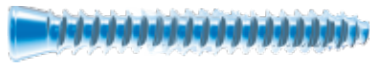
Measure the screw length using the appropriate scale on the 50mm Depth Gauge.

Using the T-10 Driver, remove the PDG and insert the correct length 3.5mm Multi-Thread Compression Screw until the screw head contacts the plate.

Remove the 2.0mm K-wire at the base of the HR tab, then fully seat the Compression Screw until the plate is reduced to the olecranon.

NOTE:

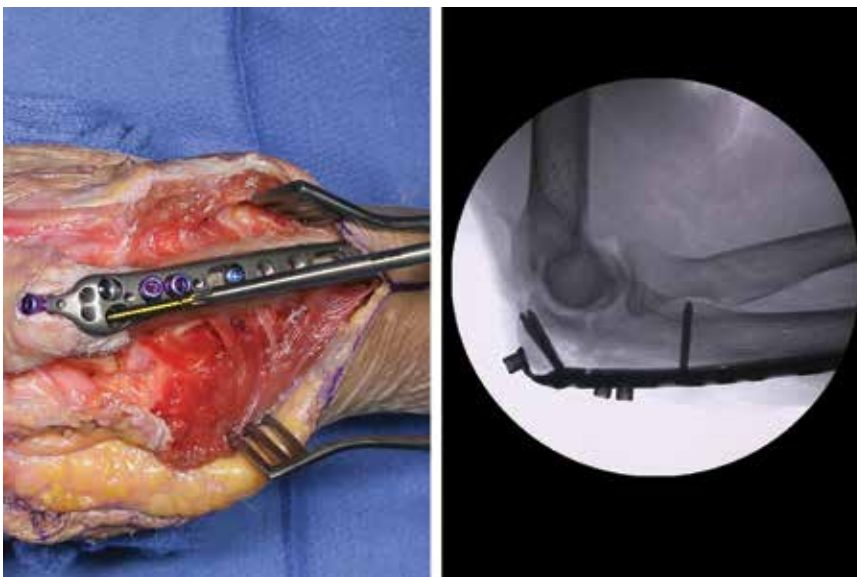
It is recommended to subtract ~ 2mm from the measured screw lengths to avoid compromising the articular surfaces and/or soft tissue irritation.



Multi-Thread Compression Screw

FLUOROSCOPIC CONFIRMATION

14



Repeat steps 12 and 13 for the remaining olecranon screw hole using a 3.5mm Multi-Thread Locking Screw.

Confirm proper plate positioning, fracture reduction and screw lengths using fluoroscopic imaging.



Multi-Thread Locking Screw

15

PREPARING THE HOME RUN TAB

Confirm that the HR tab is flush to the tip of the olecranon. If necessary, you can bend the tab as described in step 30 of this surgical technique guide.

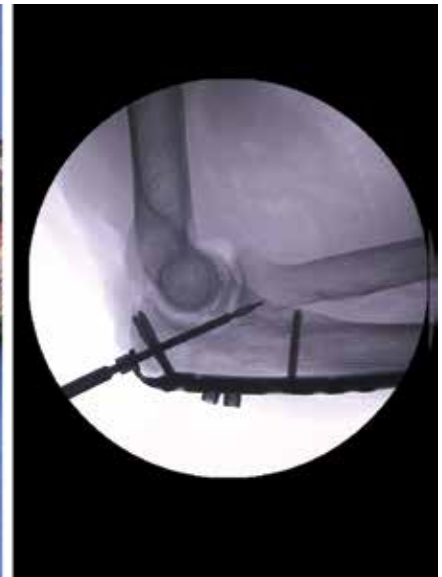
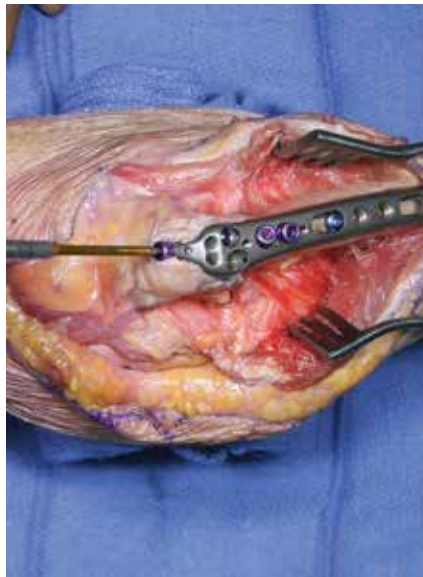
Using the 2.7mm x 80mm bit, drill through the PDG, then measure and record the screw length using the appropriate scale on the 80mm Depth Gauge.

NOTE:

If the HR tab was bent, confirm that the new trajectory will avoid contact with the articular surfaces of the joint.

WARNING:

Bending may weaken or break the tab. Be sure to inspect the tab for damage prior to use.



Drill, 2.7mm x 80mm

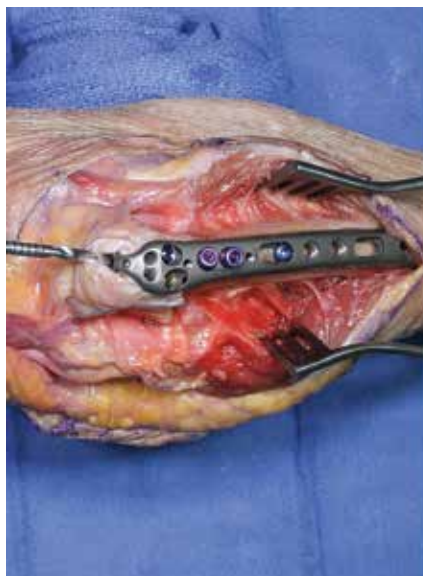
Depth Gauge, 80mm

16

OVERDRILLING THE HOME RUN TAB

Using the T-10 driver, remove the PDG in the HR tab.

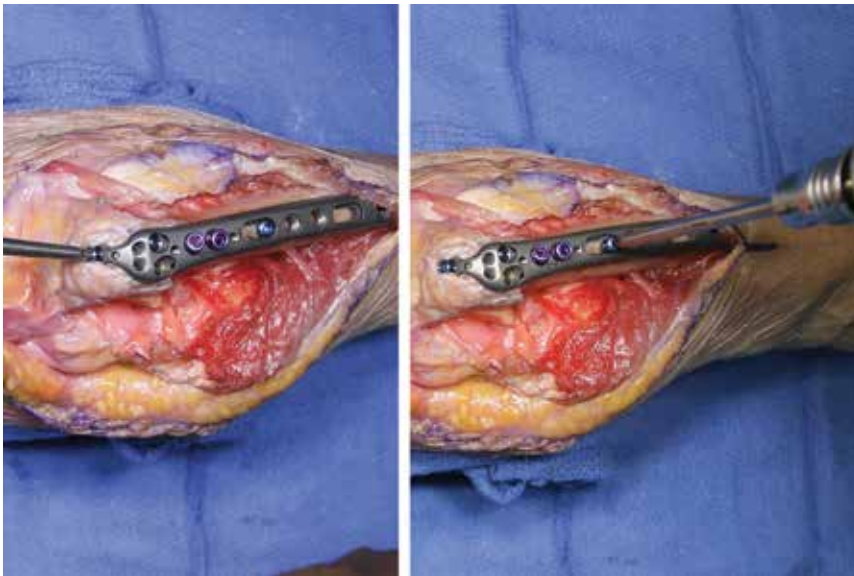
Drill up to the fracture line using the 3.5mm bit. Fluoroscopic imaging is helpful during this step.



Drill, 3.5mm x 70mm

LAGGING THE PROXIMAL FRAGMENT

17



Loosen the screw previously placed in the oblong hole of the shaft.

Insert the recorded length 3.5mm Multi-Threaded Compression Screw through the HR tab to further reduce the fracture.

Retighten the screw in the oblong hole of the shaft.



Multi-Thread Compression Screw

FLUOROSCOPIC CONFIRMATION

18



Confirm proper plate positioning, fracture reduction and screw lengths using fluoroscopic imaging.

19

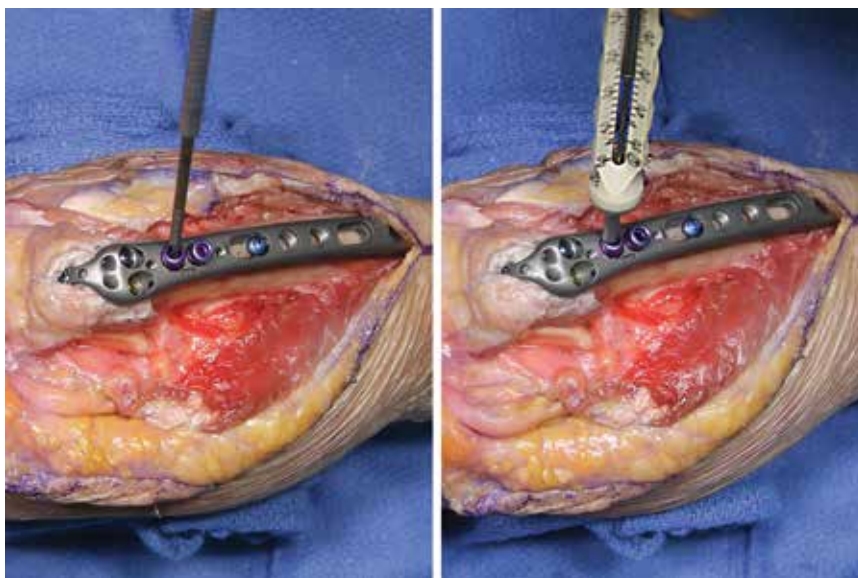
CORONOID PREPARATION

Using the 2.7mm bit, drill through a PDG.

Measure the screw length using the appropriate scale on the 50mm Depth Gauge.

NOTE:

If the HR Tab has been repositioned, consider the use of a Polyaxial Locking Screw if impingement occurs.

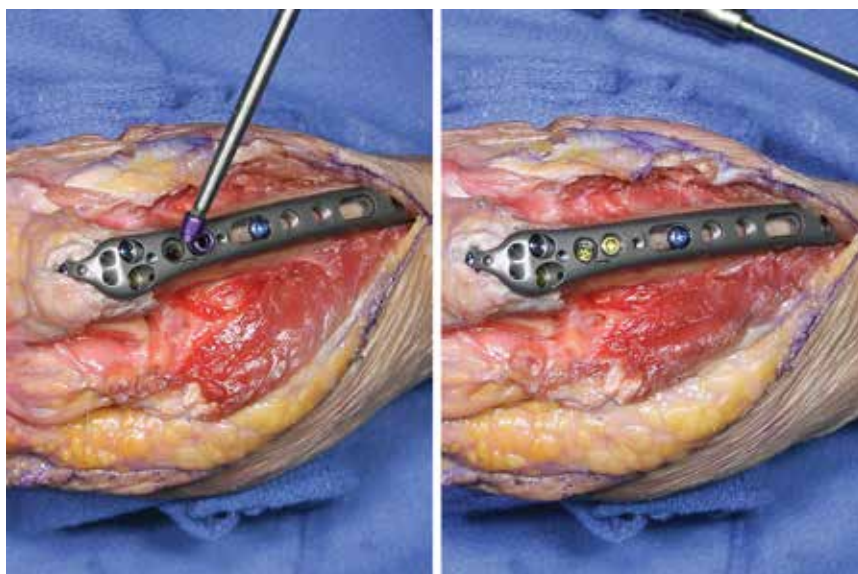


20

CORONOID FIXATION

Using the T-10 Driver, remove the PDG and insert the correct length 3.5mm Multi-Thread screw until fully tightened.

Repeat steps 19 and 20 for the remaining coronoid screw hole.



DISTAL PLATE FIXATION

21



Thread-In Drill Guide



Tissue Protector

If fixed angled fixation through any of the threaded holes is desired, secure the appropriate Thread-In Drill Guide into the selected hole.

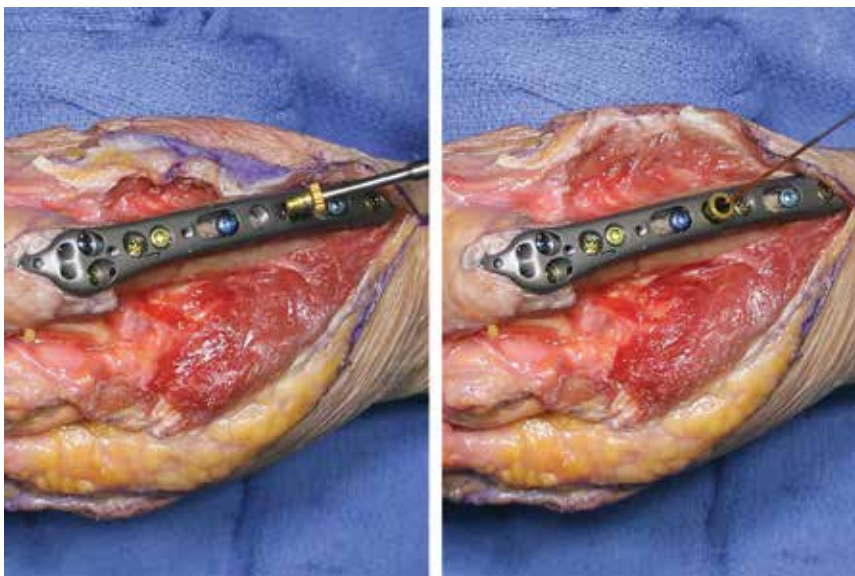
Using the 2.7mm bit, drill to the proper depth. Read the length directly from the drill or by removing the Thread-In Drill Guide and using the 50mm Depth Gauge.

Insert and fully tighten the desired screw using the T-10 Driver. Repeat this step for the remaining distal threaded holes.

For oblong holes, drill free-hand, then measure and insert a compression screw until fully seated to the plate.

CANNULATED 3.0 PLS SETUP (OPTIONAL)

22



If a Polyaxial Locking Screw is needed in any of the threaded holes, use the T-10 driver to remove the PDG if present and insert the 1.1mm PLS A.I.M.ing Guide.

Insert a 1.1mm guidewire through the PLS A.I.M.ing Guide in the desired trajectory until the far cortex is reached.

NOTE:

Fluoroscopy is helpful to confirm the trajectory of the guidewire.



PLS A.I.M.ing Guide, 1.1mm x 10°



K-wire, 1.1mm

23

FLUOROSCOPIC CONFIRMATION

After confirming that the guidewire is tacked to the far cortex, use the cannulated 3.0 PLS T-10 Driver to remove the PLS A.I.M.ing Guide leaving the guidewire in place.



3.0 PLS Driver (cannulated)

24

CANNULATED 3.0 PLS PREPARATION

Slide the cannulated Depth Gauge over the guidewire to measure the appropriate length of screw.

Using the 2.4mm Cannulated PLS bit, drill over the guidewire to the proper depth.



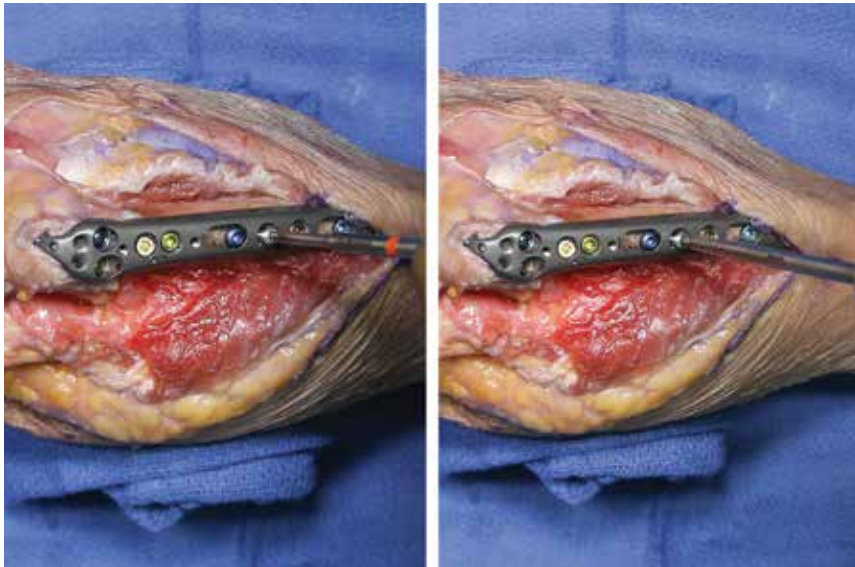
Depth Gauge, PLS 3.0



PLS Drill (cannulated) 2.4mm x 40mm

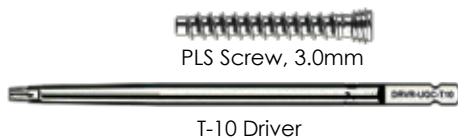
CANNULATED 3.0 PLS FIXATION

25



Using the Cannulated 3.0 PLS T-10 Driver, thread the screw down the guidewire until the head of the screw contacts the plate.

Remove the guidewire and fully lock the screw to the plate using the non-cannulated T-10 driver.

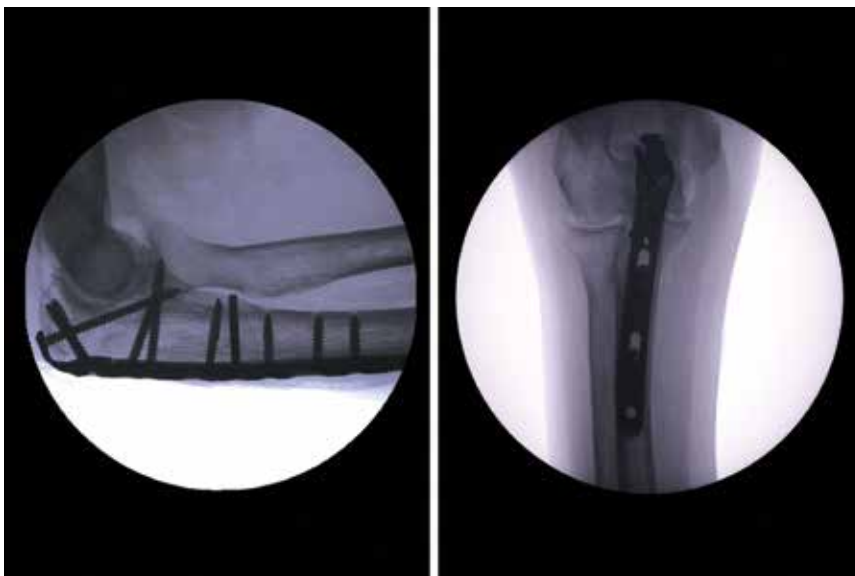


PLS Screw, 3.0mm

T-10 Driver

FLUOROSCOPIC CONFIRMATION

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Using fluoroscopic imaging, confirm that proper reduction has been maintained and that all screws are of proper length and fully engaged to the plate.

Confirm that all PDG's have been removed.

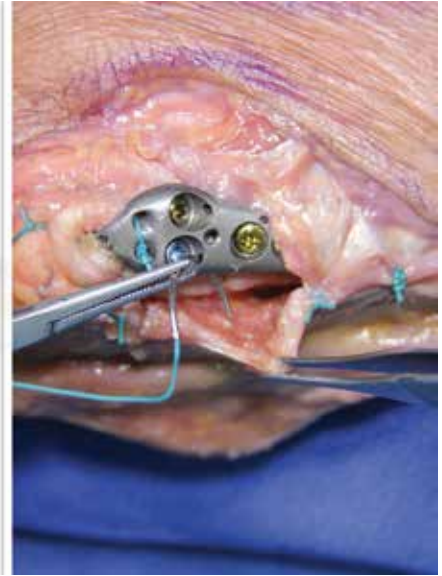
27

SOFT TISSUE ATTACHMENT POINTS (OPTIONAL)

All plates incorporate two suture attachment points proximal and distal to the olecranon screw holes that will accommodate a curved needle.

The triceps attachment points (**A**) are beneficial to augment plate fixation when the triceps insertion is avulsed and osteoporotic or comminuted olecranon fractures are evident.

The fascia attachment points (**B**) are beneficial for re-attaching the fascia when necessary.



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WOUND CLOSURE

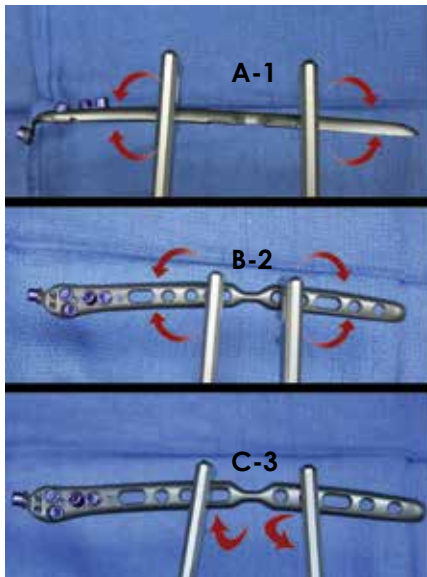
Confirm that the ulnar nerve is free of any impingement.

Close deep to superficial in your normal fashion. Apply a standard long-arm post-op dressing as necessary.



PLATE BENDING (OPTIONAL)

29



If it is necessary to modify the shaft of the 151mm plate, attach the Bending Irons to bend the plate in any plane up to 10° .

A. Vertical Plane:

Use section 1 of the Bending Irons.

B. Horizontal Plane:

Use section 2 of the Bending Irons. This plate manipulation can also be performed in-situ.

C. Transverse Plane:

Use section 3 of the Bending Irons.

NOTE:

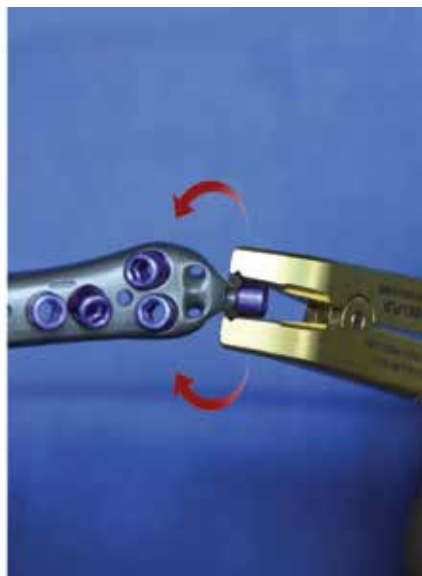
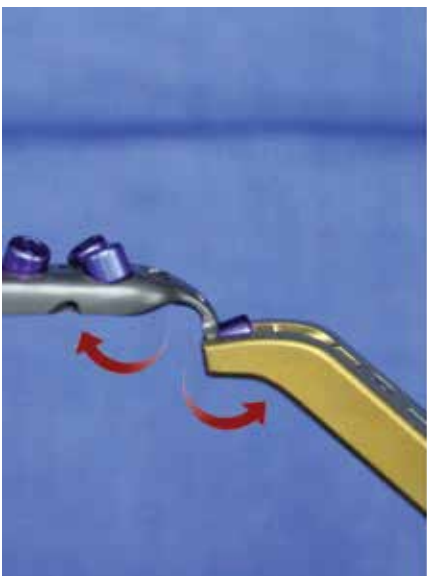
Do not exceed the respective maximum bend angles as described above.

WARNING:

Bending may weaken or break the plate. Be sure to inspect the plate for damage prior to use.

HR TAB BENDING (OPTIONAL)

30



If it is necessary to modify the HR tab, firmly hold the plate, then grip the round node of the HR tab using the Bending Pliers and shape as intended.

A. Vertical Plane: Secure the Bending Plier to bend up to 30°

B. Transverse Plane: Secure the Bending Plier to bend up to 45°

Confirm that the new trajectory avoids contact with the articular surfaces and other screw trajectories using fluoroscopy.

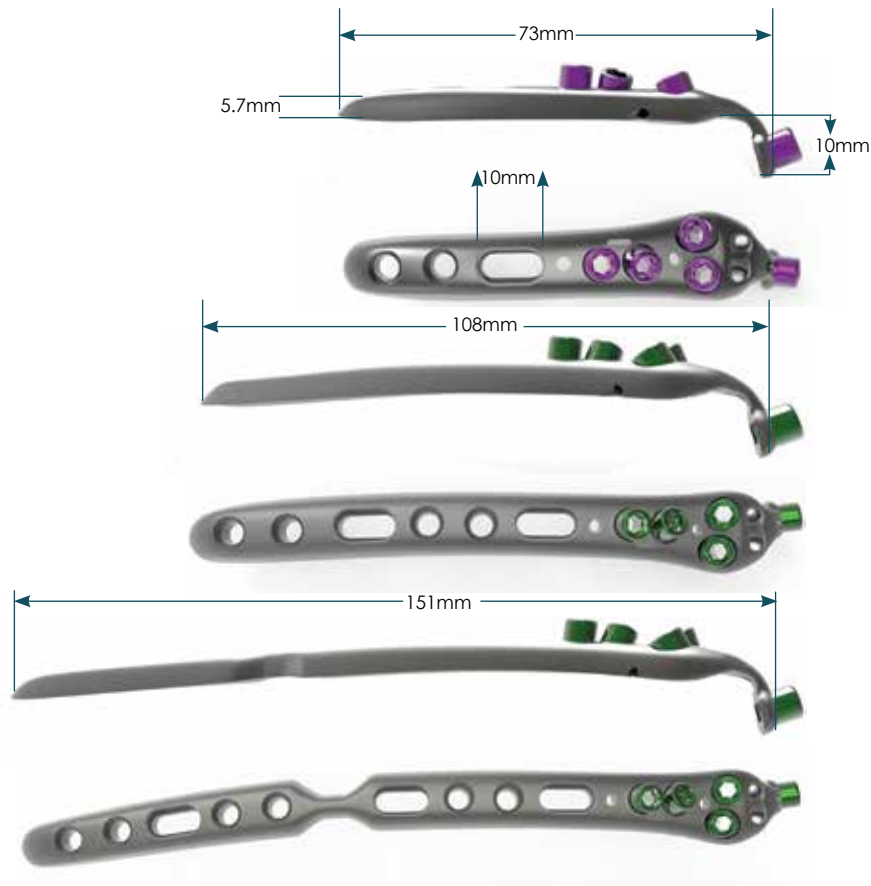
NOTE:

Do not exceed the maximum bend angles as described above.

WARNING:

Bending may weaken or break the plate. Be sure to inspect the plate for damage prior to use.

Proximal Ulna Plate Dimensions



Proximal Ulna Plates

Plate	Catalog #	Description
	APL-PUP-3HL	Proximal Ulna Plate, 73mm, Left
	APL-PUP-3HR	Proximal Ulna Plate, 73mm, Right
	APL-PUP-6HL	Proximal Ulna Plate, 108mm, Left
	APL-PUP-6HR	Proximal Ulna Plate, 108mm, Right
	APL-PUP-9HL	Proximal Ulna Plate, 151mm, Left
	APL-PUP-9HR	Proximal Ulna Plate, 151mm, Right

Screw Options

Catalog

Description



MTLS-35080-TS
MTLS-35100-TS
MTLS-35120-TS
MTLS-35140-TS
MTLS-35160-TS
MTLS-35180-TS
MTLS-35200-TS
MTLS-35220-TS
MTLS-35240-TS
MTLS-35260-TS
MTLS-35280-TS
MTLS-35300-TS
MTLS-35320-TS
MTLS-35340-TS
MTLS-35360-TS
MTLS-35380-TS
MTLS-35400-TS
MTLS-35450-TS
MTLS-35500-TS
MTLS-35550-TS
MTLS-35600-TS
MTLS-35700-TS

Screw, Multi-Thread Locking, 3.5mm x 8mm, Ti
Screw, Multi-Thread Locking, 3.5mm x 10mm, Ti
Screw, Multi-Thread Locking, 3.5mm x 12mm, Ti
Screw, Multi-Thread Locking, 3.5mm x 14mm, Ti
Screw, Multi-Thread Locking, 3.5mm x 16mm, Ti
Screw, Multi-Thread Locking, 3.5mm x 18mm, Ti
Screw, Multi-Thread Locking, 3.5mm x 20mm, Ti
Screw, Multi-Thread Locking, 3.5mm x 22mm, Ti
Screw, Multi-Thread Locking, 3.5mm x 24mm, Ti
Screw, Multi-Thread Locking, 3.5mm x 26mm, Ti
Screw, Multi-Thread Locking, 3.5mm x 28mm, Ti
Screw, Multi-Thread Locking, 3.5mm x 30mm, Ti
Screw, Multi-Thread Locking, 3.5mm x 32mm, Ti
Screw, Multi-Thread Locking, 3.5mm x 34mm, Ti
Screw, Multi-Thread Locking, 3.5mm x 36mm, Ti
Screw, Multi-Thread Locking, 3.5mm x 38mm, Ti
Screw, Multi-Thread Locking, 3.5mm x 40mm, Ti
Screw, Multi-Thread Locking, 3.5mm x 45mm, Ti
Screw, Multi-Thread Locking, 3.5mm x 50mm, Ti
Screw, Multi-Thread Locking, 3.5mm x 55mm, Ti
Screw, Multi-Thread Locking, 3.5mm x 60mm, Ti
Screw, Multi-Thread Locking, 3.5mm x 70mm, Ti



MTNL-35080-TS
MTNL-35100-TS
MTNL-35120-TS
MTNL-35140-TS
MTNL-35160-TS
MTNL-35180-TS
MTNL-35200-TS
MTNL-35220-TS
MTNL-35240-TS
MTNL-35260-TS
MTNL-35280-TS
MTNL-35300-TS
MTNL-35320-TS
MTNL-35340-TS
MTNL-35360-TS
MTNL-35380-TS
MTNL-35400-TS
MTNL-35450-TS
MTNL-35500-TS
MTNL-35550-TS
MTNL-35600-TS
MTNL-35700-TS

Screw, Multi-Thread Compression, 3.5mm x 8mm, Ti
Screw, Multi-Thread Compression, 3.5mm x 10mm, Ti
Screw, Multi-Thread Compression, 3.5mm x 12mm, Ti
Screw, Multi-Thread Compression, 3.5mm x 14mm, Ti
Screw, Multi-Thread Compression, 3.5mm x 16mm, Ti
Screw, Multi-Thread Compression, 3.5mm x 18mm, Ti
Screw, Multi-Thread Compression, 3.5mm x 20mm, Ti
Screw, Multi-Thread Compression, 3.5mm x 22mm, Ti
Screw, Multi-Thread Compression, 3.5mm x 24mm, Ti
Screw, Multi-Thread Compression, 3.5mm x 26mm, Ti
Screw, Multi-Thread Compression, 3.5mm x 28mm, Ti
Screw, Multi-Thread Compression, 3.5mm x 30mm, Ti
Screw, Multi-Thread Compression, 3.5mm x 32mm, Ti
Screw, Multi-Thread Compression, 3.5mm x 34mm, Ti
Screw, Multi-Thread Compression, 3.5mm x 36mm, Ti
Screw, Multi-Thread Compression, 3.5mm x 38mm, Ti
Screw, Multi-Thread Compression, 3.5mm x 40mm, Ti
Screw, Multi-Thread Compression, 3.5mm x 45mm, Ti
Screw, Multi-Thread Compression, 3.5mm x 50mm, Ti
Screw, Multi-Thread Compression, 3.5mm x 55mm, Ti
Screw, Multi-Thread Compression, 3.5mm x 60mm, Ti
Screw, Multi-Thread Compression, 3.5mm x 70mm, Ti

Screw Options

Catalog

Description



PANL-35080-TS	Screw, Cortical Non Locking, 3.5mm x 8mm, Ti
PANL-35100-TS	Screw, Cortical Non Locking, 3.5mm x 10mm, Ti
PANL-35120-TS	Screw, Cortical Non Locking, 3.5mm x 12mm, Ti
PANL-35140-TS	Screw, Cortical Non Locking, 3.5mm x 14mm, Ti
PANL-35160-TS	Screw, Cortical Non Locking, 3.5mm x 16mm, Ti
PANL-35180-TS	Screw, Cortical Non Locking, 3.5mm x 18mm, Ti
PANL-35200-TS	Screw, Cortical Non Locking, 3.5mm x 20mm, Ti
PANL-35220-TS	Screw, Cortical Non Locking, 3.5mm x 22mm, Ti
PANL-35240-TS	Screw, Cortical Non Locking, 3.5mm x 24mm, Ti
PANL-35260-TS	Screw, Cortical Non Locking, 3.5mm x 26mm, Ti
PANL-35280-TS	Screw, Cortical Non Locking, 3.5mm x 28mm, Ti
PANL-35300-TS	Screw, Cortical Non Locking, 3.5mm x 30mm, Ti
PANL-35320-TS	Screw, Cortical Non Locking, 3.5mm x 32mm, Ti
PANL-35340-TS	Screw, Cortical Non Locking, 3.5mm x 34mm, Ti
PANL-35360-TS	Screw, Cortical Non Locking, 3.5mm x 36mm, Ti
PANL-35380-TS	Screw, Cortical Non Locking, 3.5mm x 38mm, Ti
PANL-35400-TS	Screw, Cortical Non Locking, 3.5mm x 40mm, Ti
PANL-35420-TS	Screw, Cortical Non Locking, 3.5mm x 42mm, Ti
PANL-35440-TS	Screw, Cortical Non Locking, 3.5mm x 44mm, Ti



PALS-30200-CC	Screw, Polyaxial Locking, 3.0mm x 20mm Cannulated, CoCr
PALS-30220-CC	Screw, Polyaxial Locking, 3.0mm x 22mm Cannulated, CoCr
PALS-30240-CC	Screw, Polyaxial Locking, 3.0mm x 24mm Cannulated, CoCr
PALS-30260-CC	Screw, Polyaxial Locking, 3.0mm x 26mm Cannulated, CoCr
PALS-30280-CC	Screw, Polyaxial Locking, 3.0mm x 28mm Cannulated, CoCr
PALS-30300-CC	Screw, Polyaxial Locking, 3.0mm x 30mm Cannulated, CoCr
PALS-30320-CC	Screw, Polyaxial Locking, 3.0mm x 32mm Cannulated, CoCr
PALS-30340-CC	Screw, Polyaxial Locking, 3.0mm x 34mm Cannulated, CoCr
PALS-30360-CC	Screw, Polyaxial Locking, 3.0mm x 36mm Cannulated, CoCr
PALS-30380-CC	Screw, Polyaxial Locking, 3.0mm x 38mm Cannulated, CoCr
PALS-30400-CC	Screw, Polyaxial Locking, 3.0mm x 40mm Cannulated, CoCr

Single Use Instruments

Catalog Number

Dimensions



PDG-AIM-020	AIMing Guides, 2.0mm
KWIR-STD-20152	K-Wire, 2.0 mm x 152 mm
DRVR-UQC-T10	Driver, Universal Quick Connect, T10
DRLL-SSC-27080	Drill, 2.7mm x 80mm
DRLL-SSC-27040	Drill, 2.7mm x 40mm
DRLL-SSC-35070	Drill, 3.5mm x 70mm
PDG-AIM-011	PLS AIMing Guide, 1.1mm x 10°
KWIR-PLS-11152	K-Wire, 1.1 mm x 152 mm
DRLL-PLS-24	Drill, Cannulated, PLS, 2.4mm x 40mm

Notes

Notes

