Surgical Technique



acumed® | Forearm Fracture Solutions

Acumed® is a global leader of innovative orthopaedic and medical solutions.

We are dedicated to developing products, service methods, and approaches that improve patient care.





Acumed® Forearm Fracture Solutions

Acumed Forearm Fracture Solutions are designed to simplify surgical techniques and enhance patient outcomes. Our plating and rodding systems for the radius and ulna offer a comprehensive array of diaphyseal radius and ulna fracture treatment options. Whether managing a simple fracture or correcting a complex rotational deformity, Acumed Forearm Fracture Solutions are constructed to deliver the strength, flexibility, and performance needed in forearm procedures.

Forearm Plate Indications for Use:
Acumed Midshaft Forearm Plates are indicated for the treatment of fractures, fusions, and osteotomies of the radius and ulna.

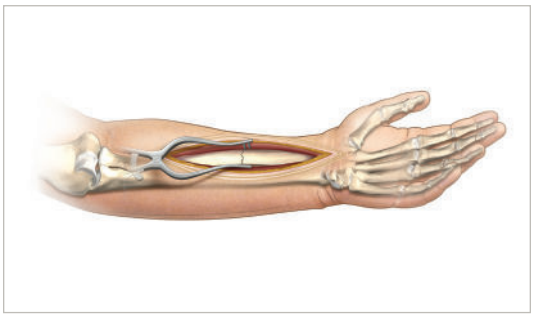
Forearm Rod Indications for Use:
Acumed Midshaft Forearm Rods are indicated for the treatment of fractures and osteotomies of the radius and ulna.

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Anatomic Midshaft Forearm Plate Surgical Technique

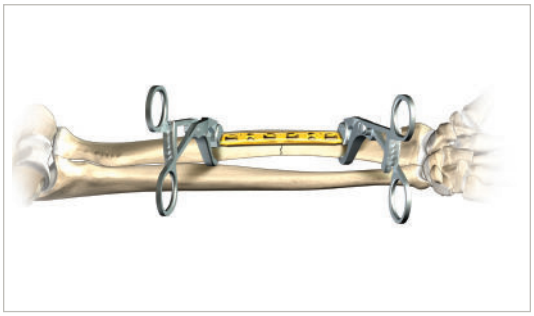
1 EXPOSURE AND FRACTURE REDUCTION



Expose the surgical site according to surgeon's preference. If both radius and ulna are fractured, reduce the bone with the simpler fracture first.

Note: A lag screw may be placed across the fracture site prior to plate application or through the plate in a later step. A 3.5 mm drill and drill guide are included in the system to lag a 3.5 mm screw.

2 PLATE SELECTION AND PLACEMENT



Use fracture assessment and/or preoperative X-ray templating to determine appropriate plate length.

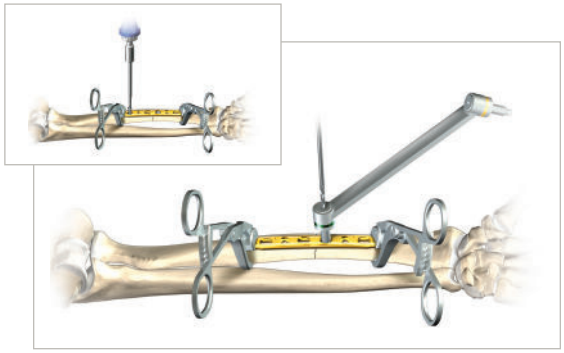
Place the selected plate onto the bone with the middle of the plate positioned over the fracture site to optimize compression.

Use Plate Tacks (PL-PTACK), Plate Clamps (80-0223), Reduction Forceps with Serrated Jaw (PL-CL04), or .062″ x 6″ Guide Wires (WS-1607ST) to aid with provisional plate fixation if necessary.

Thread the Surgical Spreader (Plate Mounted) (80-0251) into one of the locking holes in the plate with the Surgical Spreader Locking Bolt (80-0252) to aid with visibility of the surgical site.

Note: Instrument availability may vary depending on which iteration of tray is supplied.

3 NONLOCKING SCREW INSERTION



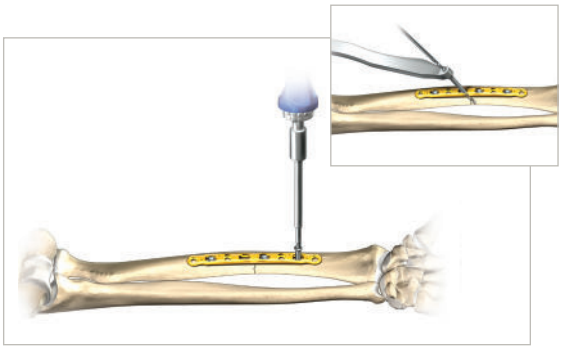
Insert nonlocking screws to ensure compression in the axial plane. Bicortical 3.5 mm screws are recommended for optimal fixation.

Use the 2.8 mm drill and appropriate drill guide for both neutral and dynamic compression drilling.

Insert screws by alternating from one side of the fracture to the other.

Check forearm rotation regularly throughout the procedure.

Note: Hex or hexalobe screws can be used in the Anatomic Midshaft Forearm Plate System. For patients with dense bone, a 3.5 mm Short Cortical Screw Tap (MS-T35S) is recommended to use prior to implantation of 3.5 mm screws.

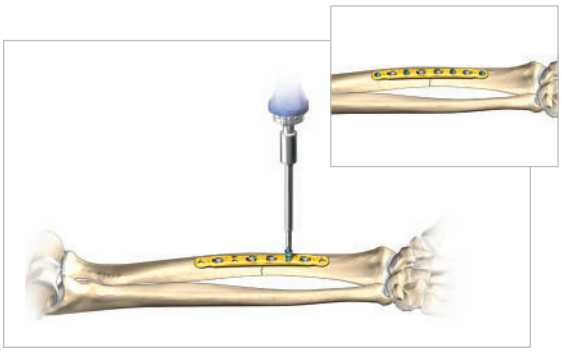


4 FRACTURE SITE COMPRESSION

Use the gold end of the Offset Drill Guide (PL-2095) to drill in dynamic compression mode to provide compression at the fracture site.

Insert 3.5 mm nonlocking screws on both sides of the fracture, engaging at least 6 cortices on each side.

Note: The plates have static locking holes if the surgeon chooses to utilize locking screw fixation. If locking screw fixation is desired, proceed to Step 5.



5 LOCKING SCREW INSERTION

Insert 3.5 mm locking screws by threading the appropriate locking drill guide into a locking hole in the plate.

Drill with the 2.8 mm drill, measure for depth, and insert the appropriate size 3.5 mm locking screw.

3.5 mm locking hex or 3.5 mm locking hexalobe screws can be used in the locking holes.

Note: Screws that can be used in system:
Hex—2.7 mm, 3.5 mm, 4.0 mm Cancellous
Hexalobe—3.0 mm, 3.5 mm

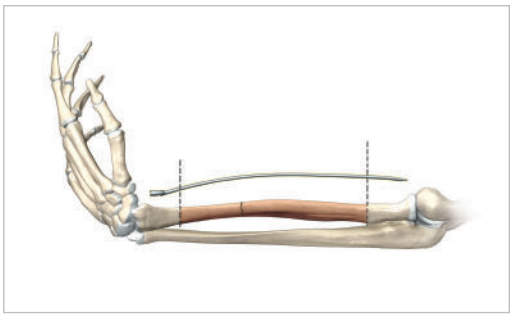
Note: Color-coded instruments for hexalobe screws:
3.5 mm—Black
3.0 mm—Red

6 POSTOPERATIVE PROTOCOL

Perform a thorough radiographic evaluation, checking reduction, alignment, and screw placement. Close the wound and support the forearm according to bone quality and stability. Postoperative rehabilitation should be at the discretion of the surgeon.

Ulna Rod Surgical Technique

1 PREOPERATIVE PLANNING AND EVALUATION



Evaluate positioning of the fracture(s) using X-ray. Check that the rod diameter will pass down the canal with minimal reaming. Choosing a diameter that is too large may cause the rod to become impacted during insertion and difficult to remove.

Estimate screw length for reference during the procedure. It may be necessary to template the uninjured ulna to more accurately estimate length.

Place patient in either the supine or the lateral position.

Both a traction device and a radiolucent table may be required to aid in reduction and evaluation.

Implant the Ulna Rod (UL-3XXX-S) under fluoroscopy to enable the evaluation of both the rod and screw position.

Radiographs in both the A/P and M/L planes will contribute to the success of the procedure.

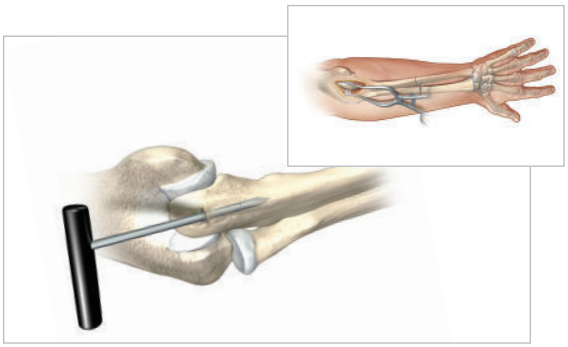
2 ASSEMBLE TARGETING GUIDE



Assemble the targeting guide by first sliding the Intramedullary Rod Locking Bolt (MS-0621) through the Intramedullary Rod Targeting Base (MS-0620) and thread it into the rod.

Align the laser mark on the base plate barrel with the corresponding laser mark on the proximal end of the Ulna Rod. This will ensure proper orientation when implanting the rod.

Tighten the locking bolt with the Locking Bolt Finger Wrench (MS-0611). Slide the Ulna M/L Targeting Guide (MS-0622) onto the base plate pins. Lock it into place with a Rosette Knob (MS-0100).



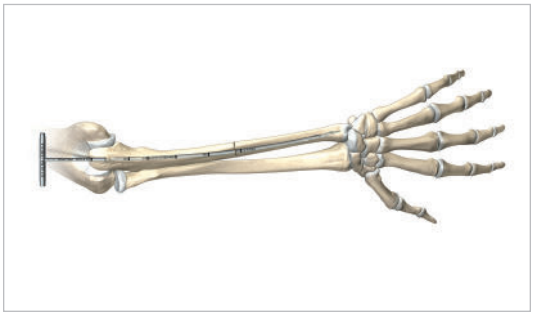
3 SURGICAL APPROACH AND CORTEX PERFORATION

Make a 1–2 cm incision longitudinally along the tip of the olecranon to expose the implant entry site.

Carry dissection down sharply through the subcutaneous tissues and the triceps tendon. Care should be taken to avoid the ulnar nerve, which sits medially to the olecranon. The method in which the insertion site is approached is at the surgeon's discretion. Variations in individual anatomy may alter the technique.

Establish the implant insertion point by using the 6.1 mm Cortical Awl Assembly (MS-0204) to perforate the cortex. The Generic Cannula Assembly (MS-2000) may be used in conjunction with the awl as a tissue protector.

Start the awl in the center of the olecranon process, directly in line with the proximal intramedullary canal of the ulna. Bury the awl to the depth groove on the shaft labeled "ULNA." Fluoroscopy is helpful when verifying proper alignment.



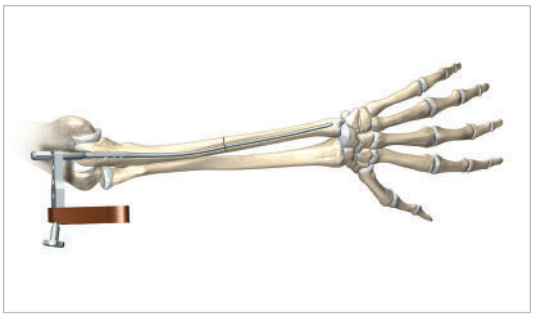
4 CANAL PREPARATION AND ROD SELECTION

Insert the selected 3.1 mm x 300 mm Intramedullary Rod Reamer (RMT3130) or 3.7 mm T-Handle Reamer (RMT3730) down the length of the canal until it reaches the metaphysis. Rod length can be read directly off of the side of the reamer handle labeled "ULNA" (shown).

The reamer should always be used to ensure that the rod will pass down the canal without becoming impacted upon insertion. Reamers are recommended for single use only.

5 IMPLANT INSERTION

Insert the Ulna Rod down the canal and across the fracture site. The rod should be aligned so that the screw is inserted from either an M/L or A/P direction based on the surgeon's preference.



Under fluoroscopy, gently glide the rod tip past the fracture site and down to the distal metaphysis.

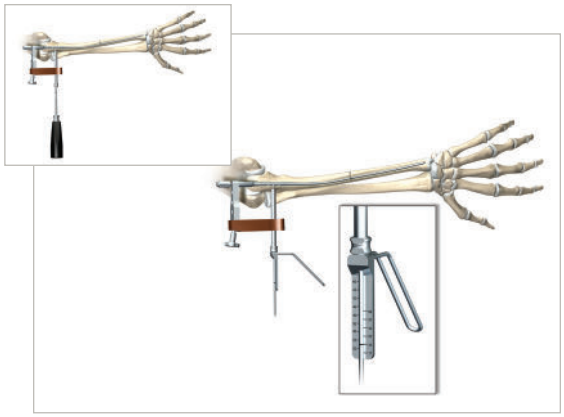
The rod should pass easily down the canal without impaction. If resistance is met, the rod should be withdrawn and the canal checked again with the appropriate reamer.

Verify in two directions that the rod has successfully crossed the fracture(s) and gained reduction.

Check that the proximal end of the rod has been inserted below the surface of the bone.

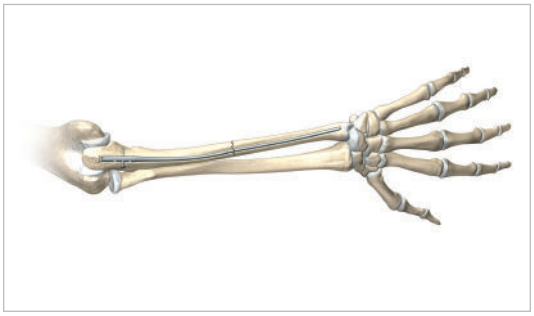
6 CANAL PREPARATION AND ROD SELECTION

Insert the 3.5 mm Targeting Cannula (HR-3101) and 3.5 mm Targeting Probe (HR-3102) into the selected hole in the targeting guide. Lightly tap the probe against the bone to create a dimple. Insert the 3.5 mm Drill Guide/Depth Gauge (HR-3104) through the cannula. Using the 2.8 mm Tap Drill (HR-D105), drill through both cortices.



Use fluoroscopy to verify drill placement depth, which is read off of the drill guide. Ensure that the drill guide is flush to the bone. Remove the drill guide and cannula.

Insert the appropriate length 3.5 mm screw through the cannula with the 2.5 mm Solid Hex Driver Assembly (HD-2500) and verify screw position under fluoroscopy. The screw should not extend past the far cortex by more than 3 mm.

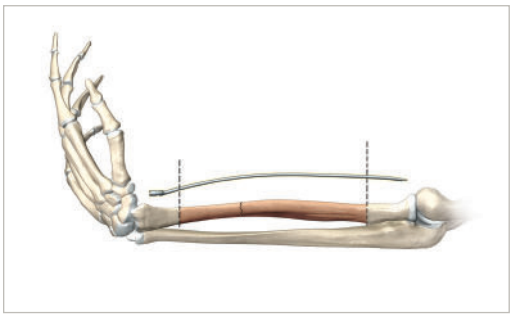


As the screw is being inserted, a groove on the driver shaft indicates that the screw is fully seated against the bone when the groove aligns with the back of the cannula.

Be sure that the cannula is fully seated against the bone if this method is used. In case dense bone is encountered, a 3.5 mm Short Cortical Screw Tap (MS-T35S) is included in the system.

Note: The Hexalobe Screw System is not currently designed to be used with the Acumed® Forearm Rod System. Forearm Rod users should continue to use the sterile-packed 3.5 mm bicortical screws.

Radius Rod Surgical Technique



1 PREOPERATIVE PLANNING AND EVALUATION

Evaluate positioning of the fracture(s) using X-ray. Check that the rod diameter will pass down the canal with minimal reaming. Choosing a diameter that is too large may cause the rod to become impacted during insertion and difficult to remove.

Estimate screw length for reference during the procedure. It may be necessary to template the uninjured radius to more accurately estimate length.

Place the patient in supine position. Both a traction device and a radiolucent table may be required to aid in reduction and evaluation.

Implant the Radius Rod (RL-3XXX-S) under fluoroscopy to enable the evaluation of both the rod and screw position.

Radiographs in both the A/P and M/L planes will contribute to the success of the procedure.



2 ASSEMBLE TARGETING GUIDE

Assemble the targeting guide by first sliding the Intramedullary Rod Locking Bolt (MS-0621) through the Intramedullary Rod Targeting Base (MS-0620) and thread it into the rod.

Align the laser mark on the base plate barrel with the corresponding laser mark on the distal end of the Radius Rod. This will ensure proper orientation when implanting the rod.

Tighten the Intramedullary Rod Locking Bolt with the Locking Bolt Finger Wrench (MS-0611). Slide the Radius M/L Targeting Guide (RA-0622) onto the base plate pins.

Lock it into place with a Rosette Knob (MS-0100).

3 FRACTURE SITE COMPRESSION

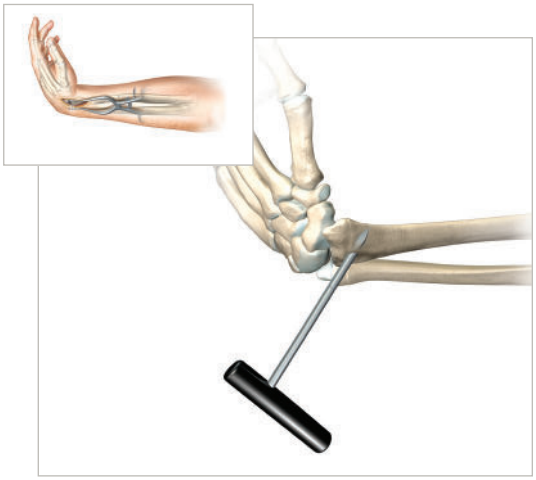
Make a 2–3 cm incision longitudinally along the distal radius over the fourth extensor compartment to expose the implant entry site.

Carry dissection down bluntly through the subcutaneous tissues. The method in which the insertion site is approached is at the surgeon's discretion. Variations in individual anatomy may alter the technique.

Establish the implant insertion point by using the 6.1 mm Cortical Awl Assembly (MS-0204) and the Generic Cannula Assembly (MS-2000) to perforate the cortex just ulnar to Lister's tubercle, approximately 5 mm from the articular surface.

Direct the awl down the canal and insert to the first depth groove labeled "RADIUS." Care should be taken to avoid accidental penetration of the adjacent cortex.

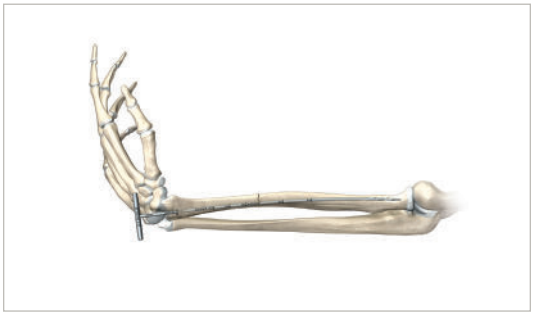
Use the Generic Cannula Assembly in conjunction with the awl as a tissue protector if necessary. Fluoroscopy is helpful when verifying proper alignment.

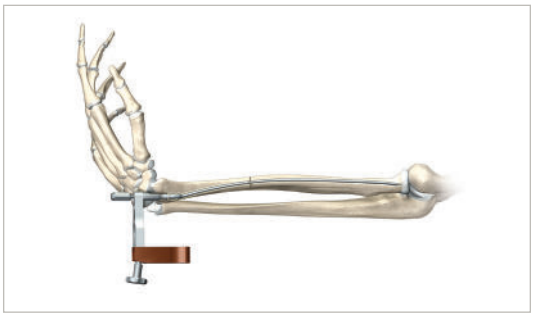


4 CANAL PREPARATION AND ROD SELECTION

Insert the selected 3.1 mm x 300 mm Intramedullary Rod Reamer (RMT3130) or 3.7 mm T-Handle Reamer (RMT3730) down the length of the radial canal until it reaches the metaphysis. Rod length can be read directly off of the side of the Reamer Handle labeled "RADIUS."

The reamer should always be used to ensure that the rod will pass down the canal without becoming impacted upon insertion. Reamers are recommended for single use only.





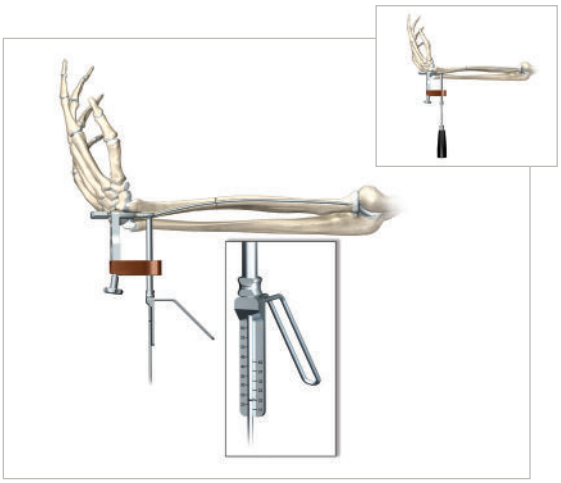
5 IMPLANT INSERTION

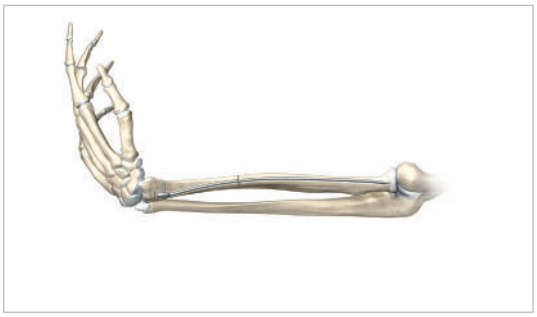
Insert the Radius Rod down the canal and across the fracture site. The rod should be aligned so that the screw is inserted from a dorsal-to-volar direction.

Under fluoroscopy, gently glide the rod tip past the fracture site and up to the proximal metaphysis.

The rod should pass easily down the canal without impaction. If resistance is met, the rod should be withdrawn and the canal checked again with the appropriate reamer.

Verify in two directions that the rod has successfully crossed the fracture(s) and gained reduction. Check that the distal end of the rod has been inserted below the surface of the bone.





6 INTERLOCKING SCREW INSERTION

Insert the 3.5 mm Targeting Cannula (HR-3101) and 3.5 mm Targeting Probe (HR-3102) into the targeting guide hole.

Lightly tap the probe against the bone to create a dimple. Insert the 3.5 mm Drill Guide/Depth Gauge (HR-3104) through the cannula. Using the 2.8 mm Tap Drill (HR-D105), drill through both cortices. Use fluoroscopy to verify drill depth, which is read off of the drill guide. Ensure that the drill guide is flush to the bone when measuring depth to allow an accurate reading.

Remove the drill guide and cannula. Insert the appropriate length 3.5 mm screw through the cannula with the 2.5 mm Solid Hex Driver Assembly (HD-2500). Verify screw position under fluoroscopy. The screw should not extend past the volar cortex by more than 3 mm.

As the screw is being inserted, a groove on the driver shaft indicates that the screw is fully seated against the bone when the groove aligns with the back of the cannula.

Be sure that the cannula is fully seated against the bone if this method is used. In case dense bone is encountered, a 3.5 mm Short Cortical Screw Tap (MS-T35S) is included in the system.

Note: The Hexalobe Screw System is not currently designed to be used with the Acumed® Forearm Rod System. Forearm Rod users should continue to use the sterile-packed 3.5 mm bicortical screws.

Ordering Information

Midshaft Volar Radius Plates

6-hole Midshaft Volar Radius Plate (80 mm)	70-0066
8-hole Midshaft Volar Radius Plate (100 mm)	70-0067
10-hole Midshaft Volar Radius Plate (130 mm)	70-0068
12-hole MIdshaft Volar Radius Plate (160 mm)	70-0069

Midshaft Ulna Plates

6-hole Midshaft Ulna Plate (80 mm)	70-0070
8-hole Midshaft Ulna Plate (100 mm)	70-0071
10-hole Midshaft Ulna Plate (130 mm)	70-0072
12-hole Midshaft Ulna Plate (160 mm)	70-0073

Dorsolateral Midshaft Radius Plates

6-hole Dorsolateral Midshaft Radius Plate (80 mm)	70-0074
8-hole Dorsolateral Midshaft Radius Plate (100 mm)	70-0075
10-hole Dorsolateral Midshaft Radius Plate (130 mm)	70-0076
12-hole Dorsolateral Midshaft Radius Plate (160 mm)	70-0077

Midshaft Forearm Plate Instrumentation (Optional)*

Plate Clamp	80-0223
Angled Drill Guide Assembly	80-0204
Surgical Spreader (Plate Mounted)	80-0251
Surgical Spreader Locking Bolt	80-0252

*Instrument availability may vary depending on which iteration of tray is supplied.

Radius Rods

3.0 mm x 190 mm Radius Rod, Left	RL-3019-S
3.0 mm x 210 mm Radius Rod, Left	RL-3021-S
3.0 mm x 230 mm Radius Rod, Left	RL-3023-S
3.6 mm x 190 mm Radius Rod, Left	RL-3619-S
3.6 mm x 210 mm Radius Rod, Left	RL-3621-S
3.6 mm x 230 mm Radius Rod, Left	RL-3623-S
3.0 mm x 190 mm Radius Rod, Right	RR-3019-S
3.0 mm x 210 mm Radius Rod, Right	RR-3021-S
3.0 mm x 230 mm Radius Rod, Right	RR-3023-S
3.6 mm x 190 mm Radius Rod, Right	RR-3619-S
3.6 mm x 210 mm Radius Rod, Right	RR-3621-S
3.6 mm x 230 mm Radius Rod, Right	RR-3623-S

Ulna Rods

3.0 mm x 210 mm Ulna Rod	UL-3021-S
3.0 mm x 230 mm Ulna Rod	UL-3023-S
3.0 mm x 250 mm Ulna Rod	UL-3025-S
3.0 mm x 270 mm Ulna Rod	UL-3027-S
3.6 mm x 210 mm Ulna Rod	UL-3621-S
3.6 mm x 230 mm Ulna Rod	UL-3623-S
3.6 mm x 250 mm Ulna Rod	UL-3625-S
3.6 mm x 270 mm Ulna Rod	UL-3627-S

Ordering Information

3.5 mm Cortical Screws

3.5 mm x 12.5 mm Cortical Screw	CO-3125-S
3.5 mm x 15.0 mm Cortical Screw	CO-3150-S
3.5 mm x 17.5 mm Cortical Screw	CO-3175-S
3.5 mm x 20.0 mm Cortical Screw	CO-3200-S
3.5 mm x 22.5 mm Cortical Screw	CO-3225-S
3.5 mm x 25.0 mm Cortical Screw	CO-3250-S
3.5 mm x 27.5 mm Cortical Screw	CO-3275-S
3.5 mm x 30.0 mm Cortical Screw	CO-3300-S
3.5 mm x 32.5 mm Cortical Screw	CO-3325-S

Forearm Rod Instrumentation

2.5 mm Solid Hex Driver Assembly	HD-2500
3.5 mm Targeting Cannula	HR-3101
3.5 mm Targeting Probe	HR-3102
3.5 mm Drill Guide/Depth Gauge	HR-3104
2.8 mm Tap Drill	HR-D105
Rosette Knob	MS-0100
6.1 mm Cortical Awl Assembly	MS-0204
Locking Bolt Finger Wrench	MS-0611
Intramedullary Rod Targeting Base	MS-0620
Intramedullary Rod Locking Bolt	MS-0621
Ulna M/L Targeting Guide	MS-0622
Generic Cannula Assembly	MS-2000
6.1 mm x 5″ Drill	MS-D761
3.5 mm Short Cortical Screw Tap	MS-T35S
Radius M/L Targeting Guide	RA-0622
3.1 mm x 300 mm Intramedullary Rod Reamer	RMT3130
3.7 mm T-Handle Reamer	RMT3730

Forearm Fracture Solutions Tray

Forearm Solutions Lid	80-1920
Forearm Solutions Base	80-1921
Forearm Solutions Rod Instrument Tray	80-1922
Midshaft Forearm Instrument Tray	80-1915
Midshaft Forearm Plate Tray	80-1916
Forearm Hexalobe Screw Caddy	80-1917
Forearm Hexalobe Screw Caddy Lid	80-1918

Midshaft Forearm Plating System Tray

Midshaft Forearm Plate System Lid	80-1914
Midshaft Forearm Instrument Tray	80-1915
Midshaft Forearm Plate Tray	80-1916
Forearm Hexalobe Screw Caddy	80-1917
Forearm Hexalobe Screw Caddy Lid	80-1918

To learn more about the full line of Acumed® innovative surgical solutions, including Anatomic Midshaft Forearm Plates and Forearm Rod System, please contact your local Acumed Sales Representative or call 888.627.9957.

Notes:

Notes:

Notes:

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