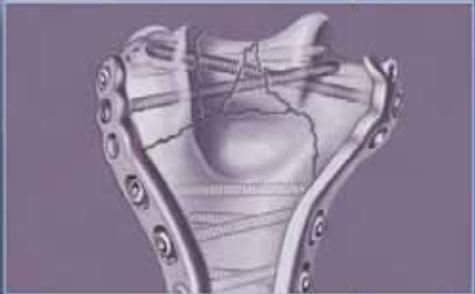


A&U MED[®]



With
Tap-Loc[™]
Technology



Mayo Clinic

CONGRUENT ELBOW PLATE SYSTEM

CONGRUENT ELBOW PLATES

Since 1988, Acumed has been designing solutions to the demanding situations facing orthopedic surgeons, hospitals and their patients. Our strategy has been to know the indication, design a solution to fit, and deliver quality products and instrumentation. The Mayo Clinic Congruent Elbow Plate System exemplifies this philosophy of quality and cutting-edge innovation.

Designed to address fractures of the distal humerus, olecranon and coronoid, Mayo Clinic Congruent Elbow Plates offer pre-contoured, indication specific plates featuring variable angle Tap-Loc™ Technology.

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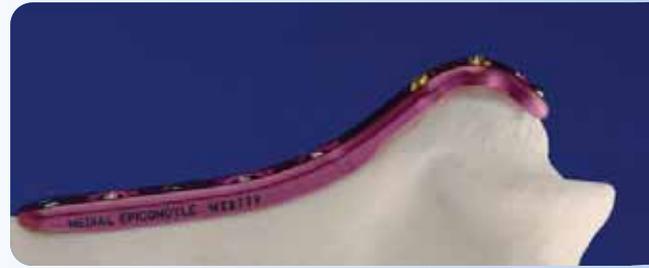


Orthopedic surgeons are continually developing improved methods of fracture fixation and rehabilitation. Acumed recognizes that often these new fixation methods require changes and advancements in orthopedic implants and technology. Our goal is to design implants and instrumentation that address new fixation techniques, solve issues with current fixation methods and provide the best possible outcome for the patient.

Mayo Clinic Congruent Elbow Plates, designed by Shawn O'Driscoll, Ph.D., M.D., have revolutionized the way orthopedic surgeons treat and manage elbow fractures. Dr. O'Driscoll's experience has shown that the "parallel" plate placement on the distal humerus, combined with increased plate strength over standard reconstruction plates¹, allows for early rehabilitation and preservation of elbow function and motion.

Acumed believes that surgeons should have the ability to determine the trajectory of the locking screws in the distal humerus. This freedom offers the surgeon a means to maximize fixation in the distal fragments, providing the best possible outcome for the patient.

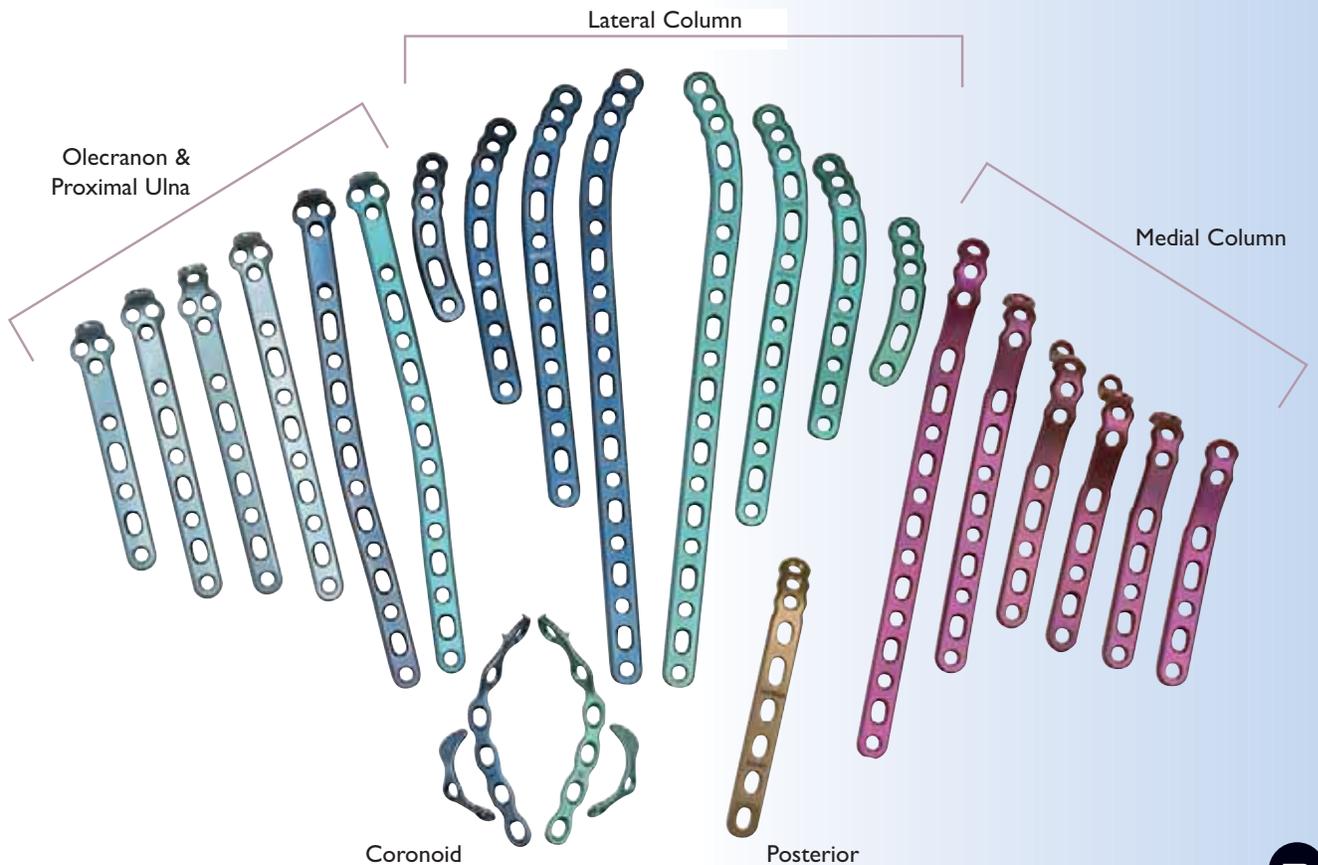
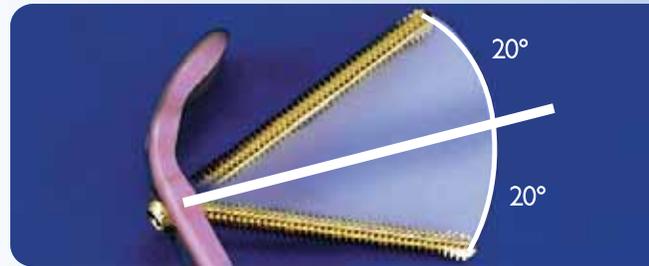
Pre-Contoured Plates eliminate the need for the surgeon to bend the plates to match the anatomy of the patient. For complex fractures, the plates act as a template to restore the natural anatomic geometry of the distal humerus.



Parallel Plate Placement provides a more stable construct than plates placed at a 90° orientation². Biomechanical data shows that parallel plate placement has greater strength and stability, especially when the elbow is subjected to A/P and torsional forces³.



Tap-Loc™ Technology allows the surgeon to angle the locking screws in the distal humerus up to 20° in each direction and create threads in the plate hole with a customized tap. This provides flexibility when capturing fracture fragments while maintaining the benefits of a traditional locking screw.



PRE-CONTOURED PLATES



Mayo Clinic Congruent Elbow Plates are pre-contoured to match the natural anatomy of the elbow, minimizing the need for the surgeon to bend the plates prior to application. For complex fractures, the plates are able to act as a template for anatomic restoration of the elbow.

Traditional straight plates weaken with repeated bending in the O.R. Pre-contoured plates offer a stronger alternative than straight reconstruction plates¹ while maintaining a low profile. The design of the plates allows for maximum fixation and stability in the distal humerus and proximal ulna.



Plates should maximize stability of periarticular fragments to facilitate rehabilitation.

Clustered screw holes in the articular region increase stability and strength of the reconstruction. This improved stability allows the plates to compress these articular fragments with the shaft to achieve union of the fracture fragments.



Plates should offer a low profile design to decrease irritation and hardware prominence.

Plate profile and screw/plate interface were designed with the soft tissues in mind. The plates thin down in the periarticular region and the screw heads are recessed within the low profile plates.



Plate thickness should be optimized for each region of the bone.

Continuous change in thickness provides strength along the metaphysis/diaphysis where it is needed, while maintaining a low profile in the periarticular areas where limited soft tissue coverage may be an issue.

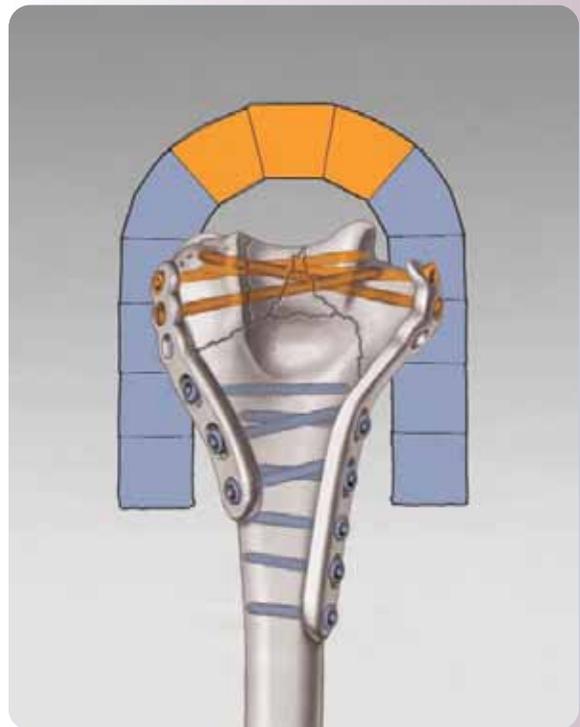
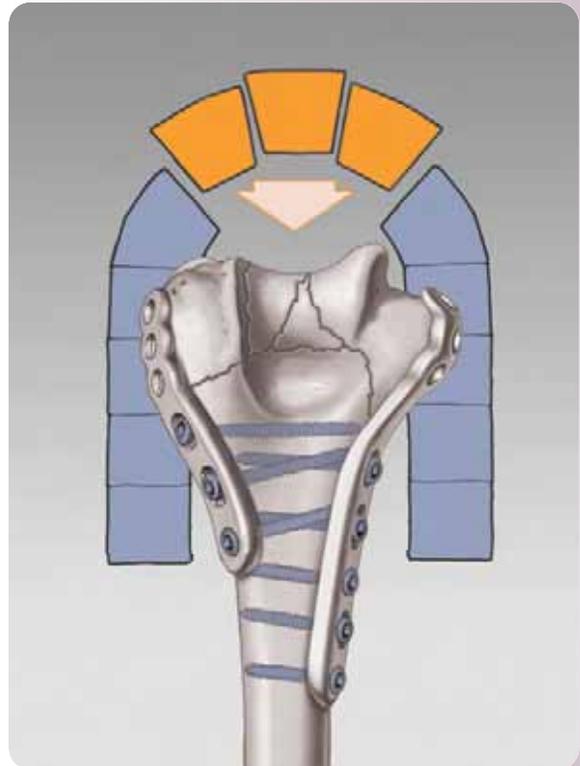
PARALLEL PLATE PLACEMENT

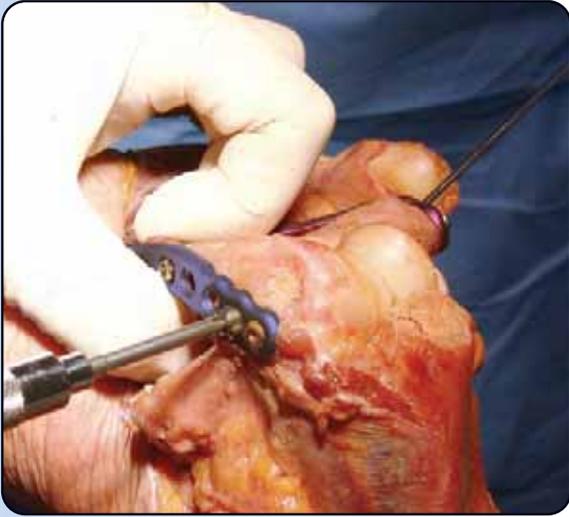
The parallel placement of Mayo Clinic Congruent Elbow Plates provides a strong and stable construct so that the surgeon does not have to immobilize the elbow for an extended period post-op. The strength of the plates, along with the parallel application and locking technology, greatly reduces the chance of hardware failure. This also allows the patient to begin rehabilitation and range of motion exercises immediately after surgery.

Because screws come from opposing sides of the condyles, long screws are able to interdigitate in the distal fragments, creating an “arch” construct. The interdigitating screws provide the keystone to the arch, creating a stable construct for immediate, aggressive rehabilitation.

90° plate orientation was supported early on in a study that compared 90° plating to a Y-plate and crossed screws, but did not compare “perpendicular” to “parallel” plating⁵. A second comprehensive study found “parallel” plating to be the best construct for reconstruction of a comminuted distal humerus⁶. This study proved that plates placed in parallel configuration on the medial and lateral columns were stronger than 90° plating when a gap was present between the articular fragments and the shaft, as when the humerus is severely fractured.

Both studies were written before the introduction of Mayo Clinic Congruent Elbow Plates, which optimize the biomechanics even further with their locking capability, placement and strength.



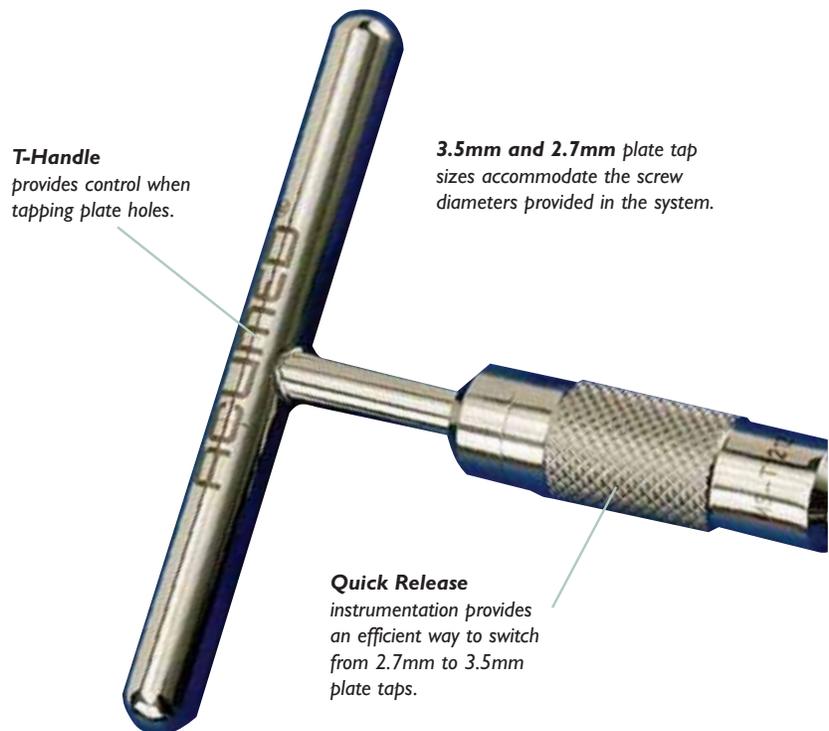


Acumed Single Use Tapping Instrument Precautions:

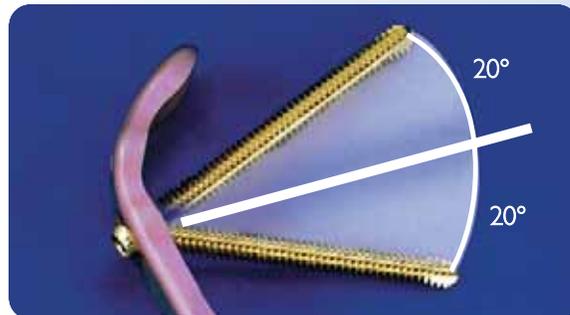
Tapping a plate using a plate tap will cause titanium debris to be generated, which should be removed. Failure to remove the plate debris can cause, among other complications, inflammation, cartilage damage and patient discomfort. The taps are single surgery use and should be discarded after each surgery or if the tap becomes dull or damaged. If the resistance increases while using a tap, discard the tap immediately. Breakage to the tap can occur due to excessive torque or levering and care should be taken to avoid such conditions. Should breakage occur, carefully remove all tap pieces.

Dr. O'Driscoll's goal is to combine his philosophy for distal humeral fracture treatment with variable angle locking technology. Because anatomy and fracture patterns in the distal humerus vary from patient to patient, he saw the importance of allowing the surgeon to choose the angle of the distal locking screws. In addition, the locking threads of each locking screw should accurately coincide with the threads in the plate to ensure maximum locking strength and stability. Mayo Clinic Locking Distal Humeral Plates, featuring Tap-Loc Technology, offer the surgeon a system with these benefits as the next generation for the treatment of distal humeral fractures.

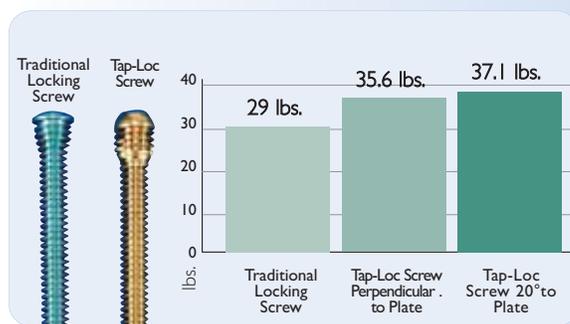
With Mayo Clinic Congruent Elbow Plates, Dr. O'Driscoll has designed a system of pre-contoured plates that maximize fixation in the articular fragments, contributing to the stability of the entire reconstruction. These plates provide stability, allowing for aggressive rehabilitation beginning immediately after surgery.



Multidirectional Screw Angles give the surgeon the freedom to angle the distal locking screws up to 20° in each direction. This provides flexibility when capturing fracture fragments while maintaining the benefits of a traditional locking screw.



Tap Biomechanical Data shows that tapping a plate by hand does not result in a weaker screw-to-plate interface between the tapped hole and the locking screw when compared to a traditional locking plate⁷.



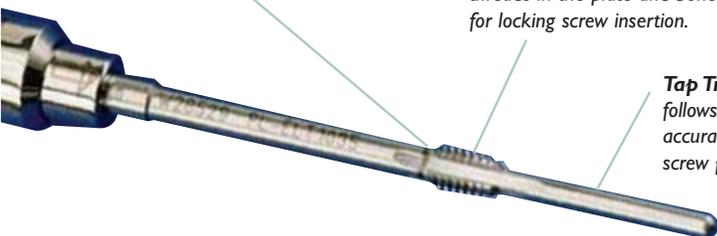
Drill Guide Clamp allows the surgeon to drill and position the distal screws with confidence and accuracy. The clamp barrel is placed in the appropriate plate hole and the tip of the clamp is positioned in the desirable location of the screws' ending point.



Laser Mark indicates maximum tapping depth.

Tapping Threads allow the surgeon to tap the plate after drilling, creating threads in the plate and bone for locking screw insertion.

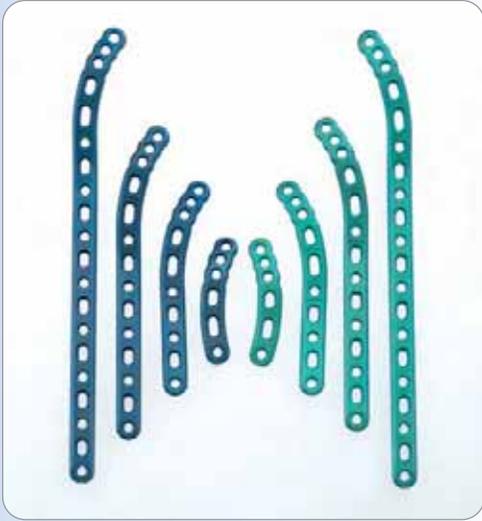
Tap Trajectory Guide follows the drill path for accurate tap angle and screw placement.



Tapping Instructions:

- Do not tap deeper than the start of the laser line.
- Clean debris from tap after tapping each hole.
- Irrigate hole prior to tapping.
- Do not tap a slot.
- Do not re-tap a hole (use a non-locking screw).
- Tap by hand, not under power.
- Angle of tapped hole must not exceed 20°.

DISTAL HUMERUS PLATES



Pre-contoured in three planes, the locking distal humerus plates offer multiple lengths and sizes to treat a wide variety of fractures.

Lateral Column Plates

These plates improve upon posterior plating biomechanically by enabling the use of longer screws that interdigitate with screws coming from the medial side. The Lateral plate comes in both lefts (blue) and rights (green) and are 11mm in width and 2.0mm at the thickest point. Lengths range from 58mm to 206mm.



Medial Column Plates

Distally, these plates extend down to, or wrap around the medial epicondyle or even extend down onto the medial trochlea. Extending up the condylar ridge, these locking plates offer solid fixation and compression. This fixation is maximized when the screws in the articular fragments can interdigitate with those coming from the lateral side. The medial plates are 11mm wide and 2.0mm at the thickest point and offer 2-4 screw holes for fixation of the articular fragments. Lengths range from 84mm to 175mm.



Technical Objectives for Locking Distal Humerus Plates:

1. Every screw should pass through a plate.
2. Each screw engages a fragment on the opposite side that is also attached to a plate.
3. Each screw should be as long as possible.
4. Each screw should engage as many fragments as possible.
5. The screws in the distal fragments should lock together by interdigitation, creating a "fixed angle" structure.
6. Plates should be applied such that compression is achieved at the supracondylar level for both columns.
7. Plates must be strong and stiff enough to resist breaking or bending before union occurs.

OLECRANON PLATES

Equally capable of treating osteotomies and fractures, the locking olecranon plates in the Mayo Clinic Congruent Elbow Plate System provide excellent fixation in the proximal ulna.

The prongs on the proximal tip of the olecranon plates provide provisional fixation into the triceps tendon, assisting with reduction, and improving final stability. The plate is placed directly over the triceps tendon, eliminating the need for a triceps split.

Technical Objectives for Locking Olecranon Plates:

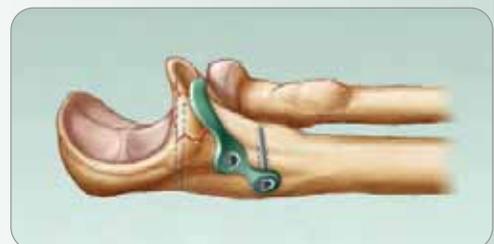
1. Each screw should be as long as possible.
2. Locking screws should interlock to provide a stable “fixed angle” structure inside the bone fragment.
3. Plate should buttress against anterior pull of elbow flexors.
4. Plate should provide stable fixation of the ulnar shaft.
5. Plate should be applied with compression across the fracture.
6. Plate must be strong and stiff enough to resist bending before union occurs.



CORONOID PLATES

Fractures of the coronoid are challenging in both their detection and treatment. While typically a small fracture, they have a heavy impact on overall elbow stability. Traditional fixation of these fractures involved capture of the coronoid fragments with screws or sutures coming from the posterior side of the ulna. This means of fixation is often not stable enough to resist the strong anterior dislocating force of the distal humerus.

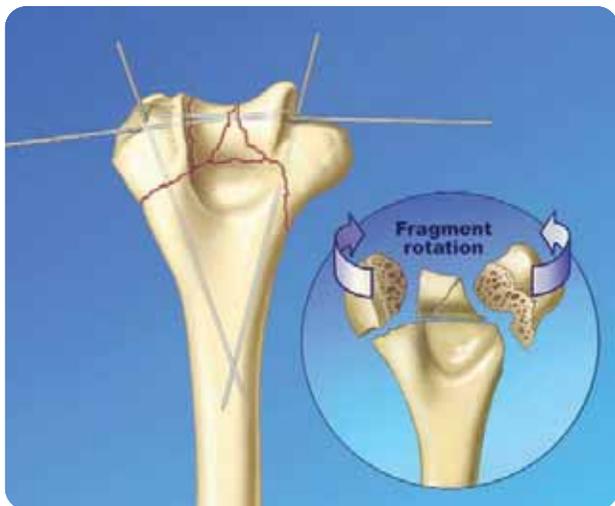
Mayo Clinic Congruent Coronoid Plates are designed to act as a buttress to the coronoid and counteract the tendency of the elbow to subluxate. With sharp prongs designed to grasp the fracture fragments, the coronoid plates provide a strong and stable way to manage these difficult fractures.



SURGICAL TECHNIQUE

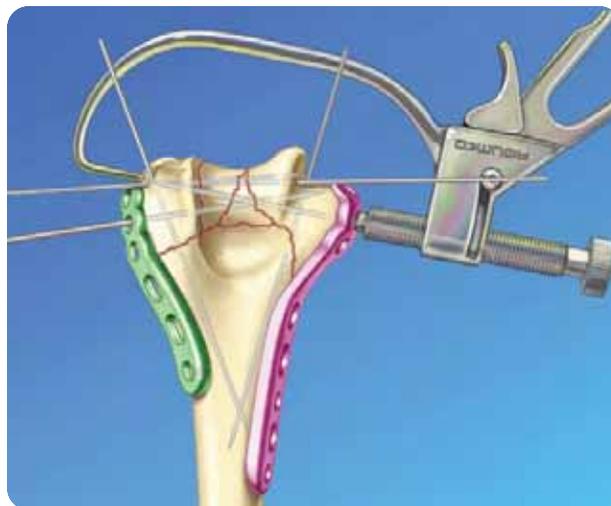
Distal Humerus Plates by Shawn O'Driscoll, Ph.D., M.D.

This section offers Acumed's suggested method for implanting the Distal Humerus Plates using Tap-Loc™ Technology. For specific questions not addressed here, please contact your local Acumed representative or Acumed at 888.627.9957.



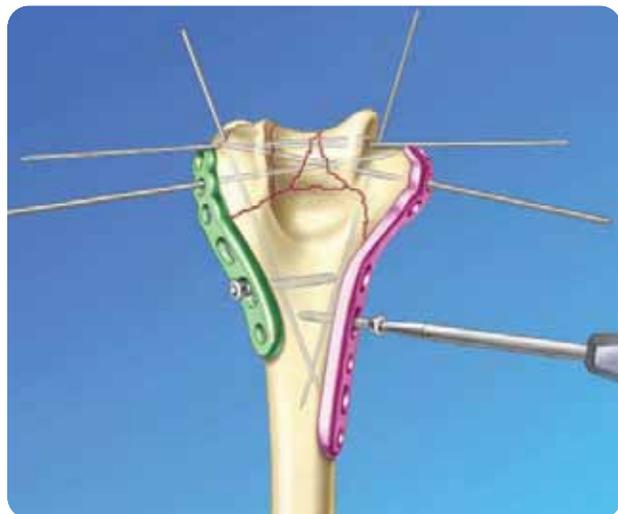
Step 1: Articular Fragment Reduction

The articular fragments, which tend to be rotated toward each other in the axial plane, are reduced anatomically and provisionally held with .045" smooth guide wires (WS-1106ST). It is essential that the guide wires be placed close to the subchondral level to avoid interference with later screw placement, and away from where the plates will be placed on the lateral and medial columns (see Step 2). One or two strategically placed guide wires can then be used to provisionally hold the distal fragments in alignment with the humeral shaft.



Step 2: Plate Placement and Provisional Fixation

The selected medial and lateral plates are placed and held apposed to the distal humerus, while one smooth 2.0mm guide wire (WS-2009ST) is inserted through hole #2 (numbered from distal to proximal) of each plate through the epicondyles and across the distal fragments to maintain provisional fixation. These 2.0mm guide wires are left in place until after Step 7 to simplify placing the locking screws in the distal fragments. The distal tap locking screws are able to be angled up to 20° in any direction.



Step 3: Initial Proximal Screw Placement

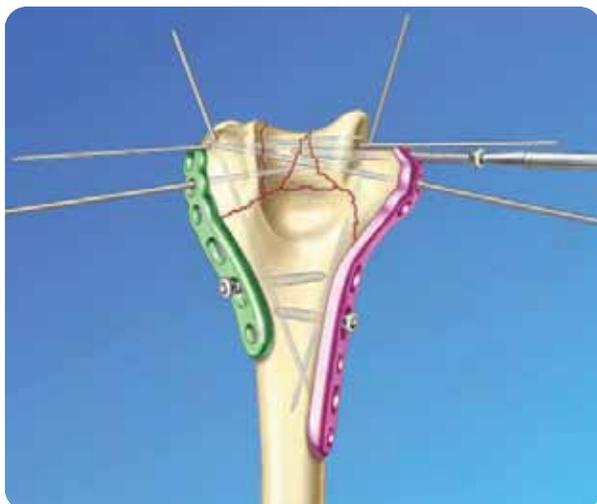
Insert a screw into a slotted hole of each plate proximal to the fracture site. Loosely tighten, allowing some freedom for the plate to move proximally during compression later. (Because the under surface of each plate is tubular in the metaphyseal and diaphyseal regions, the screw in the slotted hole only needs to be tightened slightly to provide excellent provisional fixation of the entire distal humerus.) Screw taps (MS-LTT27/35) are recommended for patients with dense bone.

A tap screw angle guide (MS-TAG20) is included in the system to verify proper angulation prior to inserting the 2.0mm guide wires, which will later be replaced with locking screws. Place the angle guide next to the plate hole when inserting a guide wire to verify that the angle is equal to or less than 20°.



A drill guide clamp (PL-CLAMP) is available in the system for accurate placement of the guide wires. Place the 2.0mm cannula (PL-20CLAMP) through the clamp and into plate hole. The opposing end of the clamp is placed at the desired exiting point of the guide wire. A 2.8mm cannula (PL-28CLAMP) is also available for accurate drilling and placement of the 3.5mm screws. Use the long 2.8mm drill (MS-LDC28) or quick release pin (MS-PIN28) to drill through the cannula. Remove clamp, measure drill depth and insert the screw.

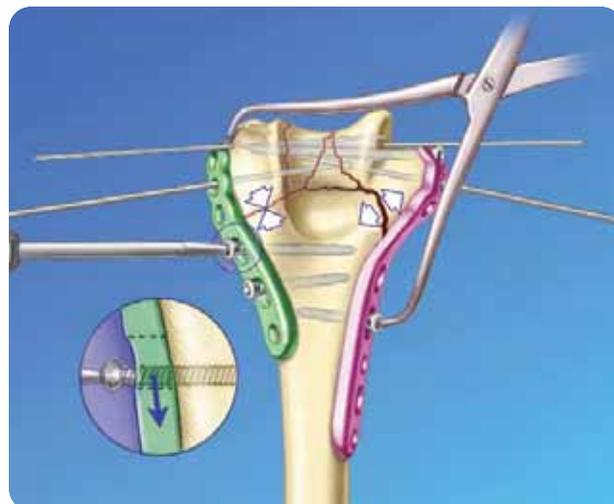




Step 4: Non-Locking Distal Screw Placement

Drill and insert screws through hole #1 on both the medial and lateral side. The clamp cannot be used in hole #1 of the medial plate if the angle exceeds 20°. After drilling, insert the appropriate non-locking screw with the driver handle (MS-3200 or MS-1210) and driver tip (HPC-0025). Long drills (MS-LDC20/28) and quick release pins (MS-PIN20/28) are meant to be used with the clamp. As more screws are inserted into the distal fragments in later steps, the pins are used as drills to glide past previously inserted screws.

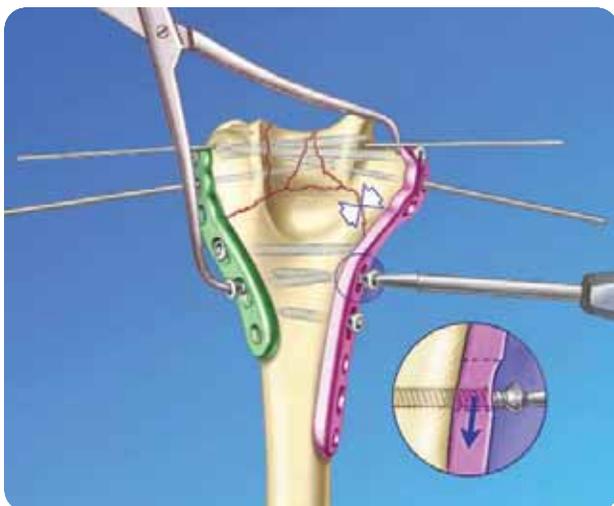
Note: In young patients, 3.5mm cortical screws are used, whereas 2.7mm screws are used in patients with osteoporotic bone.



Step 5: Compress Lateral Column

Using a large tenaculum (MS-1280) to provide interfragmentary compression across the fracture at the supracondylar level, the lateral column is first fixed. A screw is inserted in the lateral plate in dynamic compression mode in a slotted hole proximal to the fracture site (image inset) using the offset drill guide (PL-2095). Tightening this further enhances interfragmentary compression at the supracondylar level (converging arrows) to the point of causing some distraction at the medial supracondylar ridge (diverging arrows).

Note: The proximal slotted holes are NOT to be tapped.



Step 6: Compress Medial Column

The medial column is then compressed in a similar manner using the large tenaculum (MS-1280), and a 3.5mm non-locking (CO-3XX0) screw is inserted in the medial plate in dynamic compression mode in a slotted hole proximal to the fracture site, using the offset drill guide (PL-2095). If the plates are slightly under contoured, they can be compressed against the metaphysis with a large bone clamp, giving further supracondylar compression. Remove the 2.0mm guide wires (WS-2009ST) that were inserted in Step 2.

Technical Objectives Checklist:

- Every screw should pass through a plate.
- Each screw engages a fragment on the opposite side that is also attached to a plate.
- Each screw should be as long as possible.
- Each screw should engage as many fragments as possible.
- The screws in the distal fragments should lock together by interdigitation, creating a “fixed angle” structure.
- Plates should be applied such that compression is achieved at the supracondylar level for both columns.
- Plates must be strong and stiff enough to resist breaking or bending before union occurs.

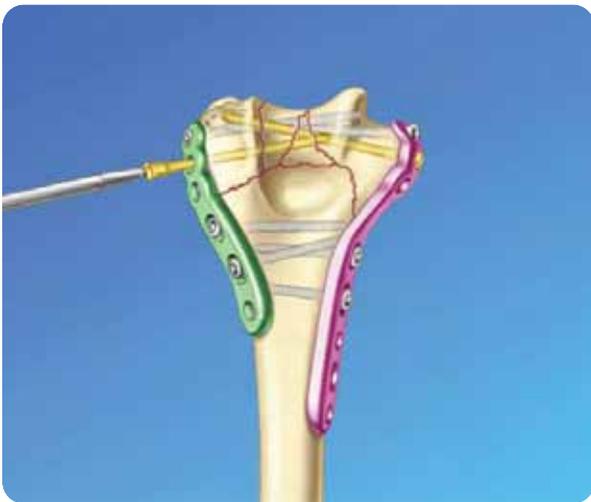
Distal Humerus Plates (cont.)



Step 7: Tap Distal Plate Hole

If using a 3.5mm screw, drill (MS-LDC28) in the path of the guide wire. If using a 2.7mm screw, the guide wire has already created the appropriate size hole for the screw. Measure drill depth (MS-9022) to determine screw size. After drilling, connect the tap (PL-ELT1027/35) to the T-Handle (MS-T1212) and tap the plate. The front end of the tap will act as a guide to ensure that the locking screw follows the correct trajectory. Turning the tap one-half turn at a time, tap the plate taking care not to insert the tap further than the start of the laser line on the tap threads. (See Tapping Instructions)

Note: The T-Handle (MS-T1212) should only be used with the plate taps and not for locking or non-locking screw insertion.



Step 8: Insert Distal Locking Screw

Insert the appropriate size tap locking screw with the connected 2.5mm hex driver (HPC-0025) and handle (MS-3200 or MS-1210). Do not overtighten the screw.

The #3 holes on both the medial and lateral columns are optional. However, if these holes are used be sure to use locking screws if locking screws have already been inserted in previous steps.

Acumed Single Use Tapping Instrument Precautions:

Tapping a plate using a plate tap will cause titanium debris to be generated, which should be removed. Failure to remove the plate debris can cause, among other complications, inflammation, cartilage damage, and patient discomfort. The taps are single surgery use and should be discarded after each surgery or if the tap becomes dull or damaged. If the resistance increases while using a tap, discard the tap immediately. Breakage to the tap can occur due to excessive torque or levering and care should be taken to avoid such conditions. Should breakage occur, carefully remove all tap pieces.

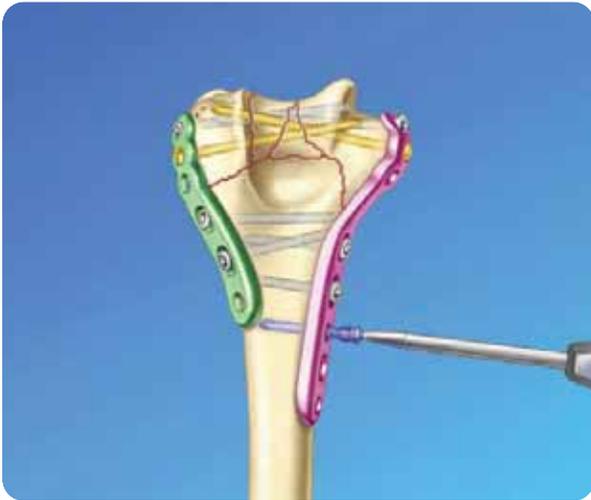
Tapping Instructions:

- Do not tap deeper than the start of the laser line.
- Clean debris from tap after tapping each hole.
- Irrigate hole prior to tapping.
- Do not tap a slot.
- Do not re-tap a hole (use a non-locking screw).
- Tap by hand, not under power.
- Angle of tapped hole must not exceed 20°.



Step 9A: Drill for Proximal Locking Screw

Remove all remaining guide wires. The remaining locking shaft screws may be inserted at the surgeon's discretion. To insert the 2.7mm or 3.5mm locking shaft screws (COL-xxx0), thread the appropriate size locking drill guide (MS-LDG27/35) into the locking hole in the plate. Drill with the appropriate size drill (MS-DC5020 or MS-DC28).



Step 9B: Insert Proximal Locking Screw

Insert the appropriate size shaft locking screw (COL-xxx0). Note that the plate holes in the humeral shaft are pre-threaded, fixed angle screws.



Step 10: Final Screw Placement

Remove all remaining guide wires. The remaining locking shaft screws may be inserted at the surgeon's discretion.

Screw Diameter	Drill Diameter
2.7mm	2.0mm
3.5mm	2.8mm
4.0mm	



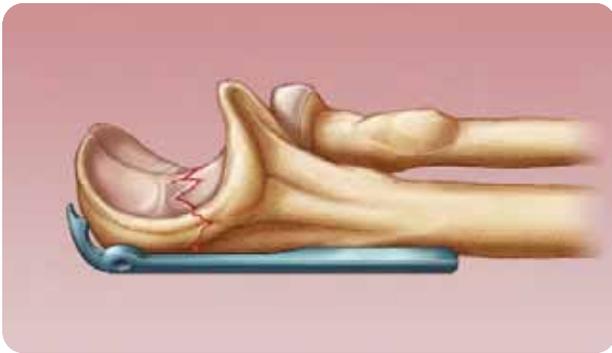
Post-op Protocol:

Immediately after closure the elbow is placed in a bulky non-compressive Robert-Jones dressing with an anterior plaster slab to keep the elbow in extension. The upper extremity is kept elevated 36 hours. After that, the Robert-Jones dressing is removed, an elastic non-constrictive sleeve is applied over an absorbent dressing placed on the wound. A program of continuous passive motion is started with the goal being able to flex and extend the elbow as much as tolerated in order to avoid fluid accumulation at the elbow region. A more complete post-op protocol is available upon request.

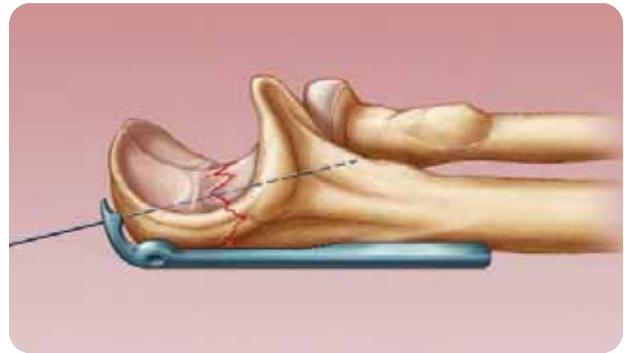
SURGICAL TECHNIQUE

Olecranon Plate by Shawn O'Driscoll, Ph.D., M.D.

This section offers Acumed's suggested method for implanting the Locking Olecranon Plate from the Mayo Clinic Congruent Elbow Plate System. For specific questions not addressed here, please contact your local Acumed representative or Acumed by phone at (888) 627-9957 or on the web at www.acumed.net.



1: Flex the elbow 90°, reduce the fracture and apply the plate. The prongs in the proximal end of the plate should penetrate the triceps tendon and provide provisional fixation. These prongs do not compress the tendon, and a gap between the plate and the bone should be visible on X-ray.

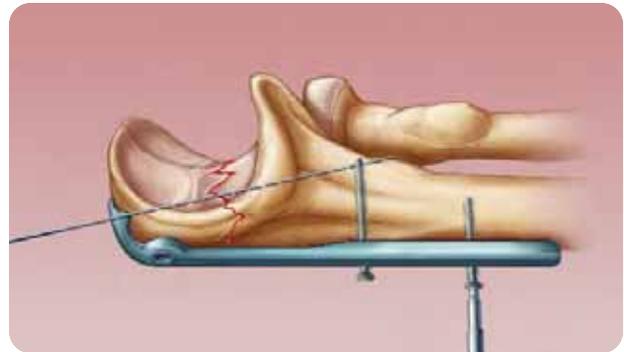


2: A 2.0mm guide wire (WS-2009ST) is drilled through the proximal hole of the plate and across the fracture site, penetrating the anterior metaphyseal cortex. Do not remove this guide wire until Step 6.

Alternatively, two .062" guide wires can be placed across the fracture, one on each side of the plate.

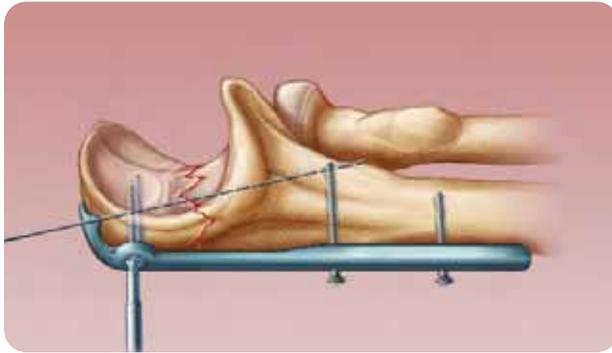


3: With provisional reduction confirmed, drill (MS-DC5020) and insert a 3.5mm non-locking screw (CO-3xx0) through the slotted hole distal to the fracture site and into the ulnar shaft. Connect the 2.5mm hex driver tip (HPC-0025) to the driver handle (MS-3200 or MS-1210) and tighten the screw partially to allow for later compression.

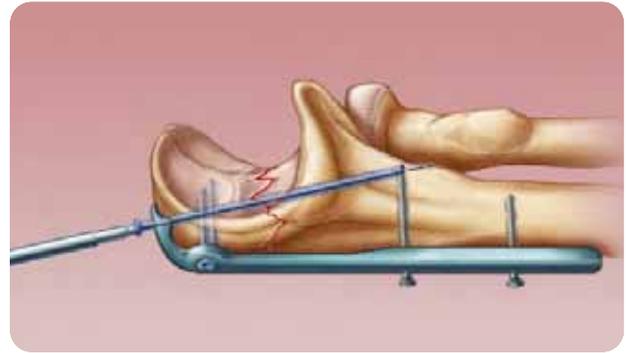


4: Insert a 3.5mm non-locking screw (CO-3xx0) in compression mode into a distal slot along the ulnar shaft. The proximal shaft screw may be loosened to allow for compression. If a longer plate is used and further compression is required, insert another non-locking screw into a distal slot in compression mode, loosening the first two screws to allow for plate movement.

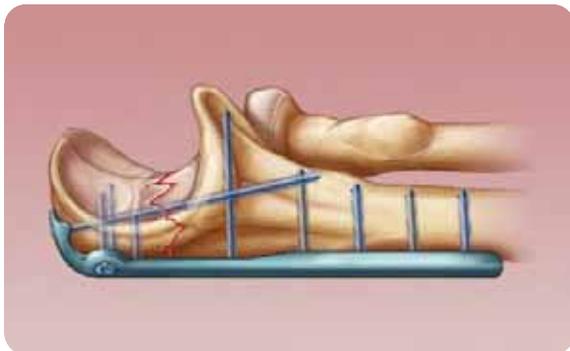
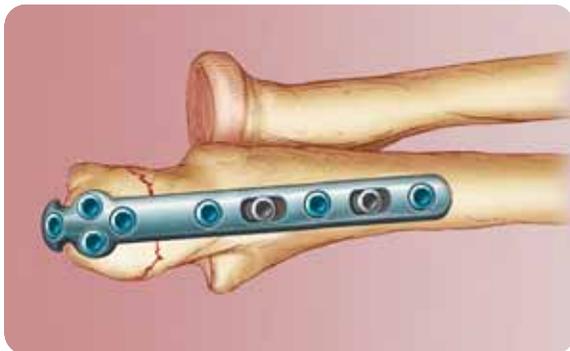
* Hard bone - tapping may be needed.



5: Insert two 2.7mm locking screws (COL-2xx0) into the proximal holes on either side of the 2.0mm guide wire, using the 2.7mm drill guide (MS-LDG27). When drilling (MS-DC5020), be careful not to exit the bone.



6: Remove the 2.0mm guide wire and insert a locking 3.5mm (COL-3xx0), "home run" screw. Use the 3.5mm locking drill guide (MS-LDG35) and 2.8mm drill (MS-DC28).



7: Fill the remaining proximal holes with 2.7mm locking screws (COL-2xx0). The screw trajectory is meant to create maximum fixation in the small proximal fragments. Insert the remaining 3.5mm locking cortical screws.

Post-op Protocol:

Immediately after closure, the elbow is placed in a bulky, non-compressive Robert-Jones dressing with an anterior plaster slab to keep the elbow in extension. The upper extremity is elevated for 36 hours. The Robert-Jones dressing is then removed and an elastic non-constrictive sleeve is applied over an absorbent dressing placed on the wound.

If soft tissue trauma and swelling have not been severe, a program of continuous passive motion begins with the goal being to flex and extend the elbow as much as tolerated to avoid fluid accumulation at the elbow region.

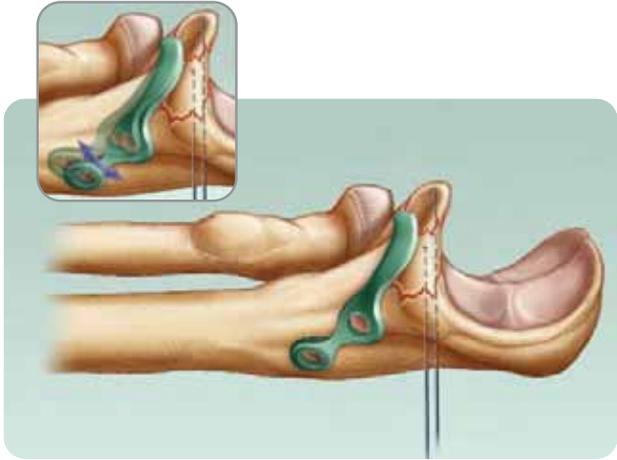
SURGICAL TECHNIQUE

Coronoid Plate by Shawn O'Driscoll, Ph.D., M.D.

This section offers Acumed's suggested method for implanting the Coronoid Plate from the Mayo Clinic Congruent Elbow Plate System. For specific questions not addressed here, please contact your local Acumed representative or Acumed by phone at (888) 627-9957 or on the web at www.acumed.net.



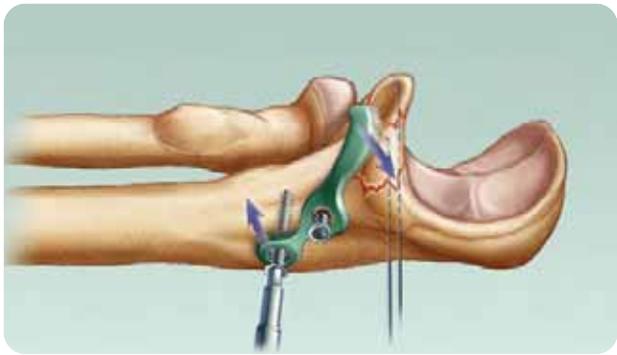
1: Expose the coronoid through an anteriomedial approach. Reduce and provisionally hold the fragments with K-wires (WT-xx0xSTT) drilled from posterior to anterior. These are best placed when retracting the coronoid fragments, so that you can see the K-wires emerge into the fracture surface. They are then backed past the fracture site to allow for reduction. Once a proper reduction is achieved, re-advance the K-wires past the fracture site and into the fragments.



2: Apply the Mayo Clinic Congruent Coronoid Plate so that the sharp prongs grasp and buttress the section of the coronoid between its tip and its sublime tubercle on which the anterior bundle of the MCL inserts. The plate should wrap around the brachialis tendon insertion onto the medial side of the ulna distally.



3: While holding the plate reduced, drill the middle hole (MS-DC5020) and insert a 2.7mm screw (CO-27xx). Do not tighten the screw.



4: Push the distal tip of the plate anteriorly, applying a lever force against the coronoid fragments, and insert a 2.7mm screw (CO-27xx) through the distal hole. Do not tighten the screw.

* Hard bone - tapping may be needed.

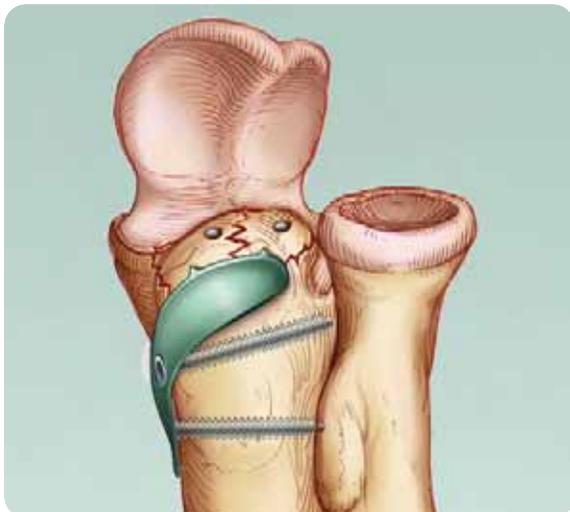


5: Tighten the proximal screw to bring the midsection of the plate to the bone and fully secure the buttress against the coronoid fragments. Tighten the distal screw. The plate will flex and contour to follow the line of the bone as this final screw is tightened.



6: Cut the K-wires flush with the ulna, eliminating soft tissue irritation.

Note: If buttressing is excellent, the K-wires can be removed. If they are to be left in they must be titanium and threaded (WT-xx0xSTT), not smooth.



Post-op Protocol:

Immediately after closure, the elbow is placed in a bulky, non-compressive Robert-Jones dressing with an anterior plaster slab to keep the elbow in extension. The upper extremity is elevated for 36 hours. The Robert-Jones dressing is then removed and an elastic non-constrictive sleeve is applied over an absorbent dressing placed on the wound.

In cases in which fracture stability is not a concern, a program of continuous passive motion begins within the limits of motion determined by soft tissue compliance, which itself is diminished due to fluid accumulation at the elbow region. Edema control is important postoperatively, as swelling limits elbow motion. It is essential that gravitational varus stresses are avoided, as these will result in displacement of the medial coronoid fracture fragment. Therefore, the arm is maintained in a vertical plane when the elbow is being moved and supporting the wrist whenever the arm is moved away from the body unloads the weight of the forearm. Both active and passive motion are permissible in most coronoid fractures that have been treated with the technique just described.

If by 4-6 weeks motion is not returning satisfactorily, a program of patient-adjusted static flexion and extension splinting should be commenced to assist with regaining motion. If heterotopic ossification is forming, the splinting program should still be used. The forces generated are small, and not a risk of worsening the heterotopic ossification.



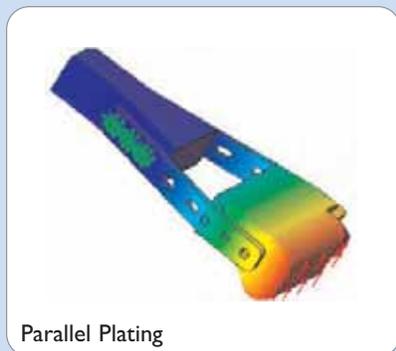
In addition to the innovative features of the Mayo Clinic Congruent Elbow Plates, Acumed designed the instrumentation set for ease of use by including everything the surgeon needs for the case in a well organized tray.

A custom Drill Guide Clamp is included in the system to provide an accurate and efficient means of targeting the trajectory of the screws in the distal humerus. The clamp barrel is placed through the clamp and into the selected plate hole. The opposing end of the clamp is then placed at the desired exiting point of the screw.

A Tap Screw Angle Guide is also included in the system to verify proper angulation prior to drilling and placing the locking screws. The angle guide is placed next to the plate hole when inserting a guide wire or drill to verify that the angle is equal to or less than 20°.

Biomechanical Testing

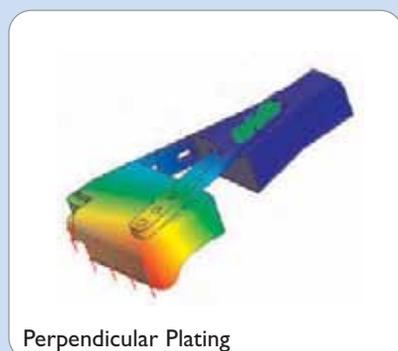
Early biomechanical testing done in a finite element analysis program at Acumed indicate significant advantages of parallel plating versus 90° plating⁸. For this study, a computer modeled a distal humerus fracture and assumed equivalent plate fixation and strength (two areas in which Mayo Clinic Congruent Elbow Plates are significantly better than 90° plating with reconstruction or tubular plates). The program simulated a load of 50 lbs. in three different planes: A/P, M/L, and Torsion. The results supported parallel plating, especially in torsional loads.



Parallel Plating

90° Plating Displaced

Anterior/Posterior: 53% more
Medial/Lateral: 5% less
Torsion: 80% more



Perpendicular Plating

ORDERING INFORMATION

Mayo Clinic Congruent Elbow Plates

PL-LEM16	16 Hole Locking Medial Plate
PL-LEM12	12 Hole Locking Medial Plate
PL-LEM9L	9 Hole, Long Locking Medial Plate
PL-LEM9S	9 Hole, Short Locking Medial Plate
PL-LEM8	8 Hole Locking Medial Plate
PL-LEM7	7 Hole Locking Medial Plate
PL-LEL20L	20 Hole Left Locking Lateral Plate
PL-LEL20R	20 Hole Right Locking Lateral Plate
PL-LEL14L	14 Hole Left Locking Lateral Plate
PL-LEL14R	14 Hole Right Locking Lateral Plate
PL-LEL10L	10 Hole Left Locking Lateral Plate
PL-LEL10R	10 Hole Right Locking Lateral Plate
PL-LEL6L	6 Hole Left Locking Lateral Plate
PL-LEL6R	6 Hole Right Locking Lateral Plate
PL-LEO17L	17 Hole Left Locking Olecranon Plate
PL-LEO17R	17 Hole Right Locking Olecranon Plate
PL-LEO13	13 Hole Locking Olecranon Plate
PL-LEO13E	13 Hole Extended Locking Olecranon Plate
PL-LEO11	11 Hole Locking Olecranon Plate
PL-LEO9	9 Hole Locking Olecranon Plate
PL-ELCOR	Coronoid Plate Left
PL-ELCOL	Coronoid Plate Right
PL-ELCLL	Extended Coronoid Plate Left
PL-ELCLR	Extended Coronoid Plate Right
PL-ELPO	Posterior Plate

2.7mm Locking Cortical Screws

COL-2120	2.7mm x 12mm
COL-2140	2.7mm x 14mm
COL-2160	2.7mm x 16mm
COL-2180	2.7mm x 18mm
COL-2200	2.7mm x 20mm
COL-2220	2.7mm x 22mm

Instruments

WT-1606STT	.062" x 6" Titanium Guide Wire
WT-0906STT	.035" x 6" Titanium Guide Wire
WS-1106ST	.045" x 6" SS Guide Wire
WS2009ST	2.0mm x 9" Guide Wire
MS-DC5020	2.0mm Quick Release Drill
MS-DC28	2.8mm Quick Release Drill
MS-DC35	3.5mm Quick Release Drill
MS-LDC20	Dia 2.0mm Long Quick Release Drill
MS-LDC28	Dia 2.8mm Long Quick Release Drill
MS-PIN20	Dia 2.0mm Long Quick Release Pin
MS-PIN28	Dia 2.8mm Long Quick Release Pin
PL-ELT1027	2.7mm Quick Release Plate Tap
PL-ELT1035	3.5mm Quick Release Plate Tap
MS-LTT27	2.7mm Long Tap Tip (Bone Tap)
MS-LTT35	3.5mm Long Tap Tip (Bone Tap)
HPC-0025	2.5mm Quick Release Driver

3.5mm Locking Cortical Screws

COL-3120	3.5mm x 12mm
COL-3140	3.5mm x 14mm
COL-3160	3.5mm x 16mm
COL-3180	3.5mm x 18mm
COL-3200	3.5mm x 20mm
COL-3220	3.5mm x 22mm
COL-3240	3.5mm x 24mm
COL-3260	3.5mm x 26mm
COL-3280	3.5mm x 28mm
COL-3300	3.5mm x 30mm
COL-3320	3.5mm x 32mm
COL-3340	3.5mm x 34mm
COL-3360	3.5mm x 36mm
COL-3380	3.5mm x 38mm
COL-3400	3.5mm x 40mm
COL-3450	3.5mm x 45mm
COL-3500	3.5mm x 50mm

3.5mm Cortical Screws

CO-3120	3.5mm x 12mm
CO-3140	3.5mm x 14mm
CO-3160	3.5mm x 16mm
CO-3180	3.5mm x 18mm
CO-3200	3.5mm x 20mm
CO-3220	3.5mm x 22mm
CO-3240	3.5mm x 24mm
CO-3260	3.5mm x 26mm
CO-3280	3.5mm x 28mm
CO-3300	3.5mm x 30mm
CO-3320	3.5mm x 32mm
CO-3340	3.5mm x 34mm
CO-3360	3.5mm x 36mm
CO-3380	3.5mm x 38mm
CO-3400	3.5mm x 40mm
CO-3450	3.5mm x 45mm
CO-3500	3.5mm x 50mm
CO-3550	3.5mm x 55mm
CO-3600	3.5mm x 60mm
CO-3650	3.5mm x 65mm

2.7mm Tap Locking Screws

FA-CO2736	2.7mm x 36mm
FA-CO2738	2.7mm x 38mm
FA-CO2740	2.7mm x 40mm
FA-CO2745	2.7mm x 45mm
FA-CO2750	2.7mm x 50mm
FA-CO2755	2.7mm x 55mm

3.5mm Tap Locking Screws

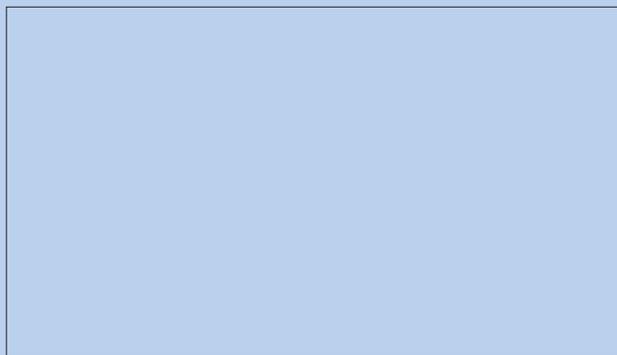
FA-CO3536	3.5mm x 36mm
FA-CO3538	3.5mm x 38mm
FA-CO3540	3.5mm x 40mm
FA-CO3545	3.5mm x 45mm
FA-CO3550	3.5mm x 50mm
FA-CO3555	3.5mm x 55mm
FA-CO3560	3.5mm x 60mm

2.7mm Cortical Screws

CO-2712	2.7mm x 12mm
CO-2714	2.7mm x 14mm
CO-2716	2.7mm x 16mm
CO-2718	2.7mm x 18mm
CO-2720	2.7mm x 20mm
CO-2722	2.7mm x 22mm
CO-2724	2.7mm x 24mm
CO-2726	2.7mm x 26mm
CO-2728	2.7mm x 28mm
CO-2730	2.7mm x 30mm
CO-2732	2.7mm x 32mm
CO-2734	2.7mm x 34mm
CO-2736	2.7mm x 36mm
CO-2738	2.7mm x 38mm
CO-2740	2.7mm x 40mm
CO-2745	2.7mm x 45mm
CO-2750	2.7mm x 50mm
CO-2755	2.7mm x 55mm
CO-2760	2.7mm x 60mm
CO-2765	2.7mm x 65mm

4.0mm Cancellous Screws

CA-4120	4.0mm x 12mm
CA-4140	4.0mm x 14mm
CA-4160	4.0mm x 16mm
CA-4180	4.0mm x 18mm
CA-4200	4.0mm x 20mm
CA-4220	4.0mm x 22mm
CA-4240	4.0mm x 24mm
CA-4260	4.0mm x 26mm
CA-4280	4.0mm x 28mm
CA-4300	4.0mm x 30mm
CA-4350	4.0mm x 35mm
CA-4400	4.0mm x 40mm
CA-4450	4.0mm x 45mm
CA-4500	4.0mm x 50mm
CA-4550	4.0mm x 55mm
CA-4600	4.0mm x 60mm



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1. Data on file at Acumed.

2. "Biomechanical Evaluation of Methods of Internal Fixation of the Distal Humerus," Schemitsch, Tencer and Henley, Journal of Orthopaedic Trauma, 1994.

3. Data on file at Acumed.

4. Data on file at Acumed.

5. "Internal Fixation of the Distal Humerus: A Biomechanical Comparison of Methods," Helfet and Hotchkiss, Journal of Orthopaedic Trauma, 1990.

6. "Biomechanical Evaluation of Methods of Internal Fixation of the Distal Humerus," Schemitsch, Tencer and Henley, Journal of Orthopaedic Trauma, 1994.

7. Data on file at Acumed.

8. Data on file at Acumed.

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