Titanium Wrist Fusion Instrument and Implant Set.

Surgical technique
Warning! This description alone is not sufficient for an immediate application of the instrumentation. Instruction by an experienced surgeon in handling this instrumentation is highly recommended.
Three Plate Options

**Standard Bend** (442.510)
Accommodates average-sized individuals.

**Short Bend** (442.520)
Fits small-statured individuals or patients with previous proximal row carpectomy.

**Straight Plate** (442.530)
- May be contoured to unusual anatomy or the severely deformed wrist joint.
- For patients with severe bone loss requiring a cortico-cancellous strut from the iliac crest.
Indications

- Post-traumatic arthritis of the joints of the wrist
- Rheumatoid wrist deformities requiring restoration
- Complex carpal instability
- Destruction of the wrist joint by infection
- Post-septic arthritis of the wrist
- Severe unremitting wrist pain related to motion
- Brachial plexus nerve palsies
- Tumor resection
- Spastic deformities
Features of the Wrist Fusion Set Plates
Precontoured plates reduce the need for intraoperative bending.

Built-in fusion angle of 10° dorsiflexion provides optimum hand position.

Reduced-profile plates with tapered ends minimize plate prominence; LC-DCP® plate design minimizes periosteal contact.

3.5 mm screws fit the proximal holes and 2.7 mm screws fit the distal holes for appropriate use in the carpals and metacarpals.
**Preoperative Evaluation**
Evaluate the condition of the soft tissues. Compare the standard bend, short bend and straight plates to the patient’s wrist, and determine which plate to use for fusion. See discussion of the use of each implant on page 9, “Wrist Fusion Implant Set.”

**1. Incision**
Place the patient in the supine position with the hand and arm on a hand table. Make a longitudinal incision from the radial aspect of the third metacarpal across Lister’s tubercle to the dorsum of the distal radius.

Open the third dorsal compartment, and transpose the extensor pollicis longus (EPL) radially. Retract the digital extensors of the index and middle fingers to expose the dorsal aspect of the third metacarpal.

Make an incision through the wrist capsule and extend it proximally to the radius along its dorsal surface. Elevate the capsule and second dorsal compartment radially, and the capsule and fourth dorsal compartment ulnarly.
2. Joint preparation

Expose and decorticate the joint surfaces to be included in the fusion. These include the scaphocapitate joint, capitolunate joint, radioscapoid joint and radiolunate joint. In some cases, the ulnar midcarpal and second and third carpometacarpal joints may be included.

Remove Lister’s tubercle and the dorsal distal aspect of the radius with an osteotome. Decorticate the dorsal surfaces of the scaphoid, lunate, and capitate.

The dorsal shavings can be saved for later use as cancellous bone graft. Cancellous bone can also be harvested from the radius, radial to the most distal screw position. If more bone is needed, it may also be obtained from the olecranon or iliac crest.
3. Plate fixation

Pack all joints to be fused with cancellous bone prior to plate fixation. Fix the plate to the third metacarpal and then to the radius. Insert screws in the sequence shown.

Position the plate directly over the dorsal aspect of the third metacarpal. Mark the position of the most distal hole. Remove the plate and drill the hole with the 2.0 mm drill bit (310.190) being sure to drill precisely in the midline, dorsal to volar. Reposition the plate and measure the depth of the hole through it. If using non-self-tapping screws, tap the hole with a 2.7 mm tap (311.260). Insert the correct length 2.7 mm cortex screw.

Insert the most proximal of the three metacarpal screws, and then the middle metacarpal screw.

Fix the plate to the capitate in a similar manner.

**Note:** If the plate sits off of the dorsal capitate, be careful not to lag the capitate up to the plate. This would distort the carpal canal and lead to volar screw prominence.

In aligning the plate over the radius, a small amount of ulnar deviation may be preferred. With the plate aligned and the hand properly oriented, begin fixation to the radius with the second-most distal hole. Place the screw in the **load position**. Drill with the 2.5 mm drill bit (310.250), tap, if needed, with the 3.5 mm tap (311.320), and insert a 3.5 mm cortex screw. Continue fixing the plate to the radius with 3.5 mm screws in the order shown, using compression or load placement if desired.

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**Order of screw placement:** 7 6 5 8 4 2 3 1

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**Bone Graft**
4. Wound closure
Close the wound in a routine fashion. Close the capsule over the plate as completely as possible. Leave the EPL radially transposed and check that it does not rub against the plate. Apply a soft, bulky dressing and/or splint to protect the wrist.
## Titanium Wrist Fusion Plates

**Standard bend** (442.510) is used for medium to large wrist fixation.

![Standard Bend](image)

**Short bend** (442.520) is used for smaller wrist fixation and for fusion following proximal row carpectomy.

![Short Bend](image)

**Straight** (442.530) is used for wrist fixation when the standard and short bend plates do not fit the anatomy. This plate can be contoured to the anatomy of the patient's wrist.

![Straight Plate](image)
Self-tapping screws in instrument and implant set

2.7 mm Titanium Cortex Screws, self-tapping
(402.810–402.824) attach the wrist fusion plate distally to the metacarpal; 10 mm to 24 mm lengths in 2 mm increments, 5 each.

3.5 mm Titanium Cortex Screws, self-tapping
(404.812–404.828) attach the wrist fusion plate proximally to the radius; 12 mm to 28 mm lengths in 2 mm increments, 5 each.

Non-Self-tapping Screws

2.7 mm Titanium Cortex Screws
(402.010–402.024) attach the wrist fusion plate distally to the metacarpal; 10 mm to 24 mm lengths in 2 mm increments, 5 each.

3.5 mm Titanium Cortex Screws
(404.012–404.028) attach the wrist fusion plate proximally to the radius; 12 mm to 28 mm lengths in 2 mm increments, 5 each.
2.0 mm Drill Bit, 100 mm, quick coupling (310.190) is used to drill holes for 2.7 mm screws

Tap for 2.7 mm Cortex Screws, 100 mm (311.260)

2.5 mm Drill Bit, 110 mm, quick coupling (310.250) is used to drill holes for 3.5 mm screws

Tap for 3.5 mm Cortex Screws, 110 mm (311.320)

Handle with quick coupling (311.430)

2.7 mm Universal Drill Guide (323.260) is used to center the drill bit and tap in the distal holes of the Wrist Fusion Plate.
For neutral screw position, press the drill guide down into the plate.
For load or buttress positions, place the drill guide at either end of the plate hole, without downward pressure. To adjust the load, vary the downward pressure applied.

3.5 mm Universal Drill Guide (323.360) is used to center the drill bit and tap in the proximal holes of the Wrist Fusion Plate.
Depth Gauge for 2.7 mm to 4.0 mm screws (319.010)
Measures depths to 60 mm

Screw Forceps, self-retaining (319.970)

Periosteal Elevator (399.480), 3 mm width, curved blade

Small Hexagonal Screwdriver with Holding Sleeve (314.020)