
Technique Guide
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Image intensifier control

Synthes
The LCP Dia-Meta (Diaphyseal–Metaphyseal) Volar Distal Radius Plate is an anatomic plate designed for fractures of the distal radius that extend into the radial shaft.

The plate design combines 2.4 mm locking technology in the distal radius with 3.5 mm LCP technology in the radial shaft. Dia-Meta plates are left and right specific and are offered in six different lengths to address a wide variety of fractures.
Features and benefits

- Precontoured plate offers an anatomic fit in the distal radius and radial shaft
- All plates are straight up to 5 holes. Beyond the fifth hole the shaft is pre-contoured to match the radial bow
- 4-hole head configuration is similar to the 2.4 mm LCP extra-articular volar distal radius plate
- Distal locking screws offer a fixed angle construct to support the articular surface
- Smooth surface finishing and rounded edges minimize tendon irritation and adhesion
- Available left or right, with 5, 7, 9, 11, 13*, or 15* hole shaft lengths
- Available in 316L stainless steel or commercially pure (CP) titanium

Plate head

- 25° angulation in head of plate fits volar distal radius
- Screw angles are identical to the angles in the 4-hole head 2.4 mm LCP extra-articular volar distal radius plate

* 13 and 15 hole plates available sterile only
AO Principles

In 1958, the AO formulated four basic principles, which have become the guidelines for internal fixation.¹ Those principles, as applied to the LCP Dia-Meta Volar Distal Radius Plate, are:

**Anatomic reduction**
The anatomic plate facilitates restoration of the articular surface with locking screws. Multiple plate lengths facilitate restoration of the radial bow.

**Stable fixation**
Locking screws create a fixed-angle construct, providing angular stability.

**Preservation of blood supply**
Limited-contact plate design reduces plate-to-bone contact. Additionally, locked plates do not need close contact with the bone, which helps limit vascular trauma.

**Early, active mobilization**
Early mobilization per standard AO technique creates an environment for bone healing, expediting a return to optimal function.

Indications

LCP Dia-Meta Volar Distal Radius Plates are indicated for fractures, osteotomies, and nonunions of the radius and other small bones.
Clinical Case

- 61-year-old female, distal radius fracture
- Used a 7-hole shaft dia-meta plate

Preoperative AP

Preoperative lateral

Postoperative AP

Postoperative lateral
## Preparation

### Required sets

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>105.434/</td>
<td>Small Fragment LCP Instrument and</td>
</tr>
<tr>
<td>145.434</td>
<td>Implant Set, with self-tapping screws (stainless steel or titanium) and</td>
</tr>
<tr>
<td>105.515/</td>
<td>2.4 mm LCP Distal Radius Plate Instrument and</td>
</tr>
<tr>
<td>145.515</td>
<td>Implant Set (stainless steel or titanium) or</td>
</tr>
<tr>
<td>01.111.120/</td>
<td>LCP Modular Mini Fragment Instrument and</td>
</tr>
<tr>
<td>01.111.140</td>
<td>Implant Set (stainless steel or titanium)</td>
</tr>
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</table>
2

**Contour plate (optional)**

**Instruments**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>329.04</td>
<td>Bending Irons, for 2.7 mm and 3.5 mm plates and 329.05 or 329.15* Bending Pliers, for 2.7 and 3.5 mm plates</td>
</tr>
</tbody>
</table>

If necessary, carefully contour the plate to fit the patient’s radial anatomy using the bending irons or bending pliers. Be careful to avoid overbending of the plate which could cause damage to the plate threads.

*Also available*
Position Patient and Approach

3 Position patient

Place the patient in the supine position with the hand and arm on a hand table, preferably radiolucent for fluoroscopic imaging. The elbow should be fully extended and in full supination.1

4 Approach

Make a longitudinal incision slightly radial to the flexor carpi radialis tendon (FCR). Dissect between the FCR and the radial artery, exposing the pronator quadratus. Detach the pronator quadratus from the lateral border of the radius and elevate it toward the ulna. The incision can be extended proximally depending on the fracture pattern and length of plate used.

To get better exposure of the radius, it is helpful to pronate the forearm.2

Important: Leave the volar wrist capsule intact to avoid devascularization of the fracture fragments and destabilization of the volar wrist ligaments.

Reduce Fracture

5
Reduce fracture and position plate

Instruments

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>310.25</td>
<td>2.5 mm Drill Bit, quick coupling, 110 mm</td>
</tr>
<tr>
<td>314.02</td>
<td>Small Hexagonal Screwdriver with Holding Sleeve</td>
</tr>
<tr>
<td>319.01</td>
<td>Depth Gauge, for 2.7 mm and small screws</td>
</tr>
<tr>
<td>323.36</td>
<td>3.5 mm Universal Drill Guide</td>
</tr>
</tbody>
</table>

After reducing the fracture, apply the plate to fit the volar surface and insert a 3.5 mm cortex screw into the first appropriate elongated Combi hole.

Drill for a 3.5 mm cortex screw.

Insert a 3.5 mm cortex screw in the nonthreaded portion of an elongated Combi hole.

Adjust the plate as necessary and tighten the screw.

Note: The fracture pattern will dictate the appropriate site for this first screw.
Insert Proximal Screws

6
Insert proximal screws

Instruments

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<th>Code</th>
<th>Description</th>
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<tr>
<td>310.25</td>
<td>2.5 mm Drill Bit, quick coupling, 110 mm</td>
</tr>
<tr>
<td>310.288</td>
<td>2.8 mm Drill Bit, quick coupling, 165 mm</td>
</tr>
<tr>
<td>312.648</td>
<td>2.8 mm Threaded Drill Guide</td>
</tr>
<tr>
<td>314.02</td>
<td>Small Hexagonal Screwdriver with Holding Sleeve</td>
</tr>
<tr>
<td>314.115</td>
<td>StarDrive Screwdriver, T15, self-retaining</td>
</tr>
<tr>
<td>319.01</td>
<td>Depth Gauge, for 2.7 mm and small screws</td>
</tr>
<tr>
<td>323.36</td>
<td>3.5 mm Universal Drill Guide</td>
</tr>
</tbody>
</table>

Determine where 3.5 mm locking or 3.5 mm cortex screws will be used in the shaft of the plate. Insert these screws as needed, according to the fracture pattern. If a combination of locking and cortex screws is planned, a cortex screw should be used first to pull the plate to the bone.

Drill for a 3.5 mm cortex screw using the 2.5 mm drill bit, with the 3.5 mm universal drill guide. Use the hexagonal screwdriver to insert the screw.

3.5 mm locking screws may be placed in the threaded portion of the Combi hole. Drill using the 2.8 mm drill bit with the 2.8 mm threaded drill guide. Use the T15 StarDrive screwdriver to insert the locking screws.
Insert Distal Screws

7
Insert distal screws and confirm joint reconstruction

Instruments

<table>
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<tr>
<th>Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>310.509</td>
<td>1.8 mm Drill Bit with depth mark, quick coupling, 110 mm</td>
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<tr>
<td>311.43</td>
<td>Handle, with quick coupling</td>
</tr>
<tr>
<td>314.467</td>
<td>StarDrive Screwdriver Shaft, T8</td>
</tr>
<tr>
<td>323.029</td>
<td>Threaded LCP Drill Guide, 1.8 mm</td>
</tr>
</tbody>
</table>

Insert 2.4 mm locking screws into the distal portion (head) of the plate. The order of screw insertion in the metaphysis may vary depending on the fracture pattern and reduction technique. Verify plate and distal screw location with the drill bit or K-wires before inserting multiple screws.
**Alternative instrument**

323.035*  
1.8 mm Threaded Drill Guide, short

The short 1.8 mm threaded drill guide can also be used in the distal locking holes. Use of the short threaded drill guide allows drill guides to be inserted in all four distal locking holes simultaneously.

Drill for a 2.4 mm locking screw using the 1.8 mm drill bit, with a 1.8 mm threaded drill guide. Use the T8 StarDrive screwdriver to insert the screw.

Confirm proper joint reconstruction, screw placement and screw length using multiple C-arm views. To assure the most distal screws are not in the joint, use additional views such as 10° tilted PA, 20° inclined lateral, and 45° pronated oblique.

* Also available
Close Incision and Implant Removal

Close incision

Use the appropriate method for surgical closure of the incision.

Implant removal

To remove locking screws, unlock all screws from the plate and then begin to remove the screws completely from the bone. This avoids rotation of the plate when removing the last locking screw.
Screws Used with the LCP Dia-Meta Volar Distal Radius Plates
Stainless Steel and Titanium

2.4 mm Locking Screws*
- For use in distal (head) round locking holes only
- Threaded, conical head locks securely into the plate to provide angular stability
- Locked screws allow unicortical screw fixation and load transfer to the near cortex
- T8 StarDrive recess mates with self-retaining screwdriver
- StarDrive recess provides improved torque transmission
- Self-tapping
- Implant-quality 316L stainless steel or titanium alloy (Ti-6Al-7Nb)
- 6 mm – 30 mm lengths (2 mm increments)

3.5 mm Locking Screws**
- For use in the locking portion of Combi holes in the plate shaft
- Threaded, conical head locks securely into the plate to provide angular stability
- Locked screws allow unicortical screw fixation and load transfer to the near cortex
- T15 StarDrive recess mates with self-retaining screwdriver and provides improved torque transmission
- Self-tapping
- Implant-quality 316L stainless steel or titanium alloy (Ti-6Al-7Nb)
- 10 mm – 30 mm lengths (2 mm increments)

3.5 mm Cortex Screws**
- For use in nonlocking portion of Combi holes in the plate shaft
- Used to provide compression or neutral fixation
- Self-tapping
- Implant-quality 316L stainless steel or titanium alloy (Ti-6Al-7Nb)
- 10 mm – 30 mm lengths (2 mm increments)

* Available in 2.4 mm LCP Distal Radius Sets (105.515/145.515) or LCP Modular Mini Fragment Sets (01.111.120/01.111.140)
** Available in Small Fragment LCP Sets (105.434/145.434)
Implants

**LCP Dia-Meta Volar Distal Radius Plates**

Plates are available in 316L stainless steel or commercially pure (CP) titanium.

**Left plates**

- 5 holes shaft, left
  - Approximate overall length: 95 mm
  - (0x.110.105)

- 7 holes shaft, left
  - Approximate overall length: 125 mm
  - (0x.110.107)

- 9 holes shaft, left
  - Approximate overall length: 154 mm
  - (0x.110.109)

- 11 holes shaft, left
  - Approximate overall length: 184 mm
  - (0x.110.111)

- 13 holes shaft, left*
  - Approximate overall length: 212 mm
  - (0x.110.113S)

- 15 holes shaft, left*
  - Approximate overall length: 240 mm
  - (0x.110.115S)

* 13 and 15 hole plates available sterile only.
◊ Available nonsterile or sterile-packed. Add “S” to catalog number for sterile product.

x = 2 for stainless steel
x = 4 for CP titanium
Right plates

- 5 holes shaft, right
  Approximate overall length: 95 mm (0x.110.005)

- 7 holes shaft, right
  Approximate overall length: 125 mm (0x.110.007)

- 9 holes shaft, right
  Approximate overall length: 154 mm (0x.110.009)

- 11 holes shaft, right
  Approximate overall length: 184 mm (0x.110.011)

- 13 holes shaft, right*
  Approximate overall length: 212 mm (0x.110.013S)

- 15 holes shaft, right*
  Approximate overall length: 240 mm (0x.110.015S)
Selected Instruments from the Small Fragment LCP Instrument and Implant Set

<table>
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<td>311.43</td>
<td>Handle, with quick coupling</td>
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<tr>
<td>312.648</td>
<td>2.8 mm Threaded Drill Guide</td>
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<td>Small Hexagonal Screwdriver with Holding Sleeve</td>
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<td>314.115</td>
<td>StarDrive Screwdriver, T15</td>
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<tr>
<td>319.01</td>
<td>Depth Gauge, for 2.7 mm and small screws</td>
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<tr>
<td>Code</td>
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<tr>
<td>323.36</td>
<td>3.5 mm Universal Drill Guide</td>
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<td>329.04</td>
<td>Bending Iron, for 2.7 mm and 3.5 mm plates, 150 mm length</td>
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<td>- Used with 329.04</td>
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## Selected Instruments from the 2.4 mm LCP Distal Radius Instrument and Implant Set or LCP Modular Mini Fragment Instrument and Implant Set

<table>
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<td>StarDrive Screwdriver Shaft, T8</td>
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<td>319.006</td>
<td>Depth Gauge, for 2.0 mm/2.4 mm screws</td>
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<td>Threaded LCP Drill Guide, 1.8 mm</td>
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### Also Available

<table>
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<th>Description</th>
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<tr>
<td>323.035</td>
<td>1.8 mm Threaded Drill Guide, short</td>
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</table>
LCP Dia-Meta Volar Distal Radius Plate Sets
Stainless Steel (01.110.025) and Titanium (01.110.026)

Module
60.110.032  LCP Dia-Meta Volar Distal Radius Plate Implant Module

Implants
LCP Dia-Meta Volar Distal Radius Plates◊
<table>
<thead>
<tr>
<th>Stainless Steel</th>
<th>Titanium</th>
<th>Shaft Holes</th>
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<td>02.110.011</td>
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<tr>
<td>02.110.111</td>
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Required Sets
105.434/ 145.434  Small Fragment LCP Instrument and Implant Set, with self-tapping screws (stainless steel or titanium)
and
105.515/ 145.515  2.4 mm LCP Distal Radius Plate Instrument and Implant Set (stainless steel or titanium)
or
01.111.120/ 01.111.140  LCP Modular Mini Fragment Instrument and Implant Set (stainless steel or titanium)

Also Available
LCP Dia-Meta Volar Distal Radius Plates*
<table>
<thead>
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<th>Stainless Steel</th>
<th>Titanium</th>
<th>Shaft Holes</th>
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<td>04.110.113S</td>
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<tr>
<td>02.110.115S</td>
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</table>

323.035  1.8 mm Threaded Drill Guide, short
329.15  Bending Pliers, for 2.7 mm and 3.5 mm plates

◊ Available nonsterile or sterile packed.
Add “S” to catalog number for sterile product.
* Plates are available sterile only and will fit into the implant module.
Note: For additional information, please refer to package insert.