

LCP Olecranon Plate. The anatomical fixation system with angular stability for olecranon and proximal ulnar fractures.

Technique Guide



LCP
Locking
Compression
Plate

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 Image intensifier control

Warning

This description is not sufficient for immediate application of the instrumentation. Instruction by a surgeon experienced in handling this instrumentation is highly recommended.

LCP Olecranon Plate. The anatomical fixation system with angular stability for olecranon and proximal ulnar fractures.

Anatomically precontoured

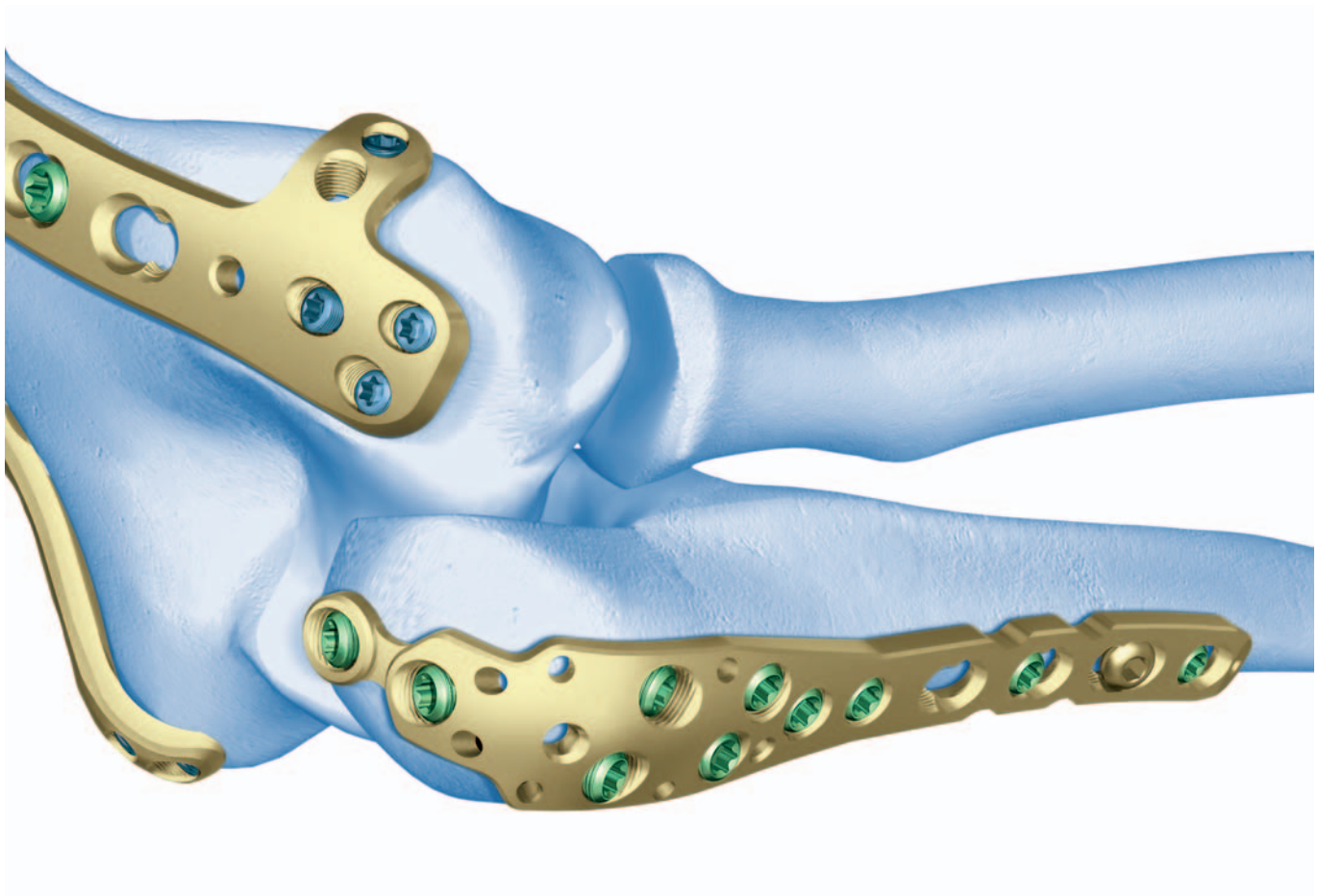
- Plates are precontoured for anatomical fit.
- Notches in the plate shaft allow the plate to be shaped to the individual anatomy of the bone.
- The tab can be cut off if not required.

Optimal fit for patient comfort

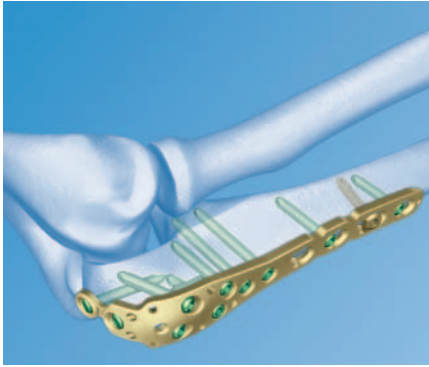
- The proximal, spoon-shaped part of the plate is slightly thinner than the shaft.
- The position and angle of the screws are anatomically adapted to allow optimal reduction of fractures.

Allows MIS technique

The LCP Olecranon Plate System provides stable fracture fixation with minimal trauma to vascular supply. This helps to create an improved environment for bone healing, accelerating the patient's return to previous mobility and function.



Part of the complete Synthes LCP Elbow Set



LCP Olecranon Plate

Variety of plates:

- Left and right version
- Choice of six lengths with 2, 4, 6, 8, 10 or 12 LCP combi-holes in the shaft

Proximal portion of the plate with 8 locking holes allows to set a maximum number of locking screws.

Guide block for easy and correct insertion

Indications

Complex extra- and intra-articular olecranon fractures
Pseudoarthrosis of the proximal ulna
Simple olecranon fractures
Repair of the olecranon after osteotomies in distal humerus surgery



LCP Distal Humerus Plates

Variety of plates:

- Dorsolateral plates with and without support
- Medial plates
- All plates in a left and right version
- All plates in five lengths: 3, 5, 7, 9 and 14 holes

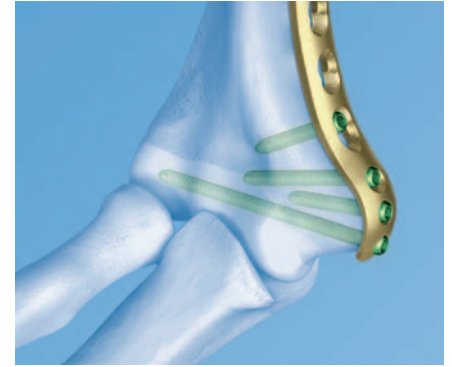
Anatomically precontoured: no or only minimal bending necessary

Extensive options for fixation
Guide block for easy and correct insertion

Indications

Intra-articular fractures of the distal humerus, especially for osteoporotic bone
Supracondylar fractures of the distal humerus
Nonunions of the distal humerus

For additional information see separate Synthes publications (Brochure 036.000.460, Technique Guide 036.000.461)



LCP Metaphyseal Distal Medial Humerus Plate

Available in five lengths: 7, 9, 11, 13 and 15 holes

Anatomically precontoured: no or only minimal bending necessary

Improved vascularisation of the bone due to plate undercuts that reduce the plate-to-bone contact

Guide block for easy and correct insertion

Indications

Juxta-articular distal humerus fractures

For additional information see separate Synthes publication (036.000.293)

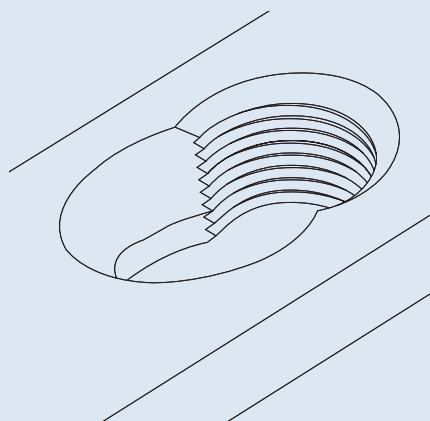
LCP Locking Compression Plate

Angular stable fixation of fragments regardless of bone quality

Minimised risk of primary and secondary loss of reduction, even under high dynamic loading

Reduced impairment of periosteal blood supply due to the limited plate contact

Good purchase also in osteoporotic bone and in multifragment fractures



LCP combi-hole

Intraoperative choice between compression and angular stable locking

With standard screws: interfragmental or dynamic-axial compression

With locking screws: stable plate-screw connection without loss of reduction, regardless of plate modelling

AO ASIF Principles

In 1958, the AO ASIF (Association for the Study of Internal Fixation) formulated four basic principles¹, which have become the guidelines for internal fixation:

Anatomic reduction

Fixation of complex extra- and intra-articular olecranon fractures with the pre-contoured 3.5 mm LCP Olecranon Plate allows anatomic reduction.

Stable fixation

Combination holes allow fixation with locking screws in the threaded section for angular stability, and cortex screws in the Dynamic Compression Unit section for compression. A fixed-angle construct is advantageous in osteoporotic bone and multifragment fractures where traditional screw purchase is compromised.

Preservation of blood supply

The LCP approach with its demonstrated success preserves the blood supply through minimal bone-to-plate contact.

Early mobilization

The LCP Olecranon Plate System, combined with AO technique, provides stable fracture fixation with minimal trauma to the vascular supply. This helps improve the environment for bone healing, accelerating the patient's return to previous mobility and function.

¹M.E. Müller, M. Allgöwer, R. Schneider, and H. Willenegger (1991) AO Manual of Internal Fixation, 3rd Edition. Berlin: Springer.

Indications and Contraindications

Indications

- Complex extra- and intra-articular olecranon fractures
- Pseudoarthroses of the proximal ulna
- Osteotomies
- Simple olecranon fractures

Contraindications

- Acute infections
- Children in growth phase

Case 1

- Male patient, 79 years old
- Olecranon fracture: 21-B1, right arm
- Bad bone quality
- Implant: LCP Olecranon Plate with 8 holes

Case 2

- Male patient, 41 years old
- Olecranon fracture: 21-C2, right arm
- Implant: LCP Olecranon Plate with 4 holes



Preoperative, AP view

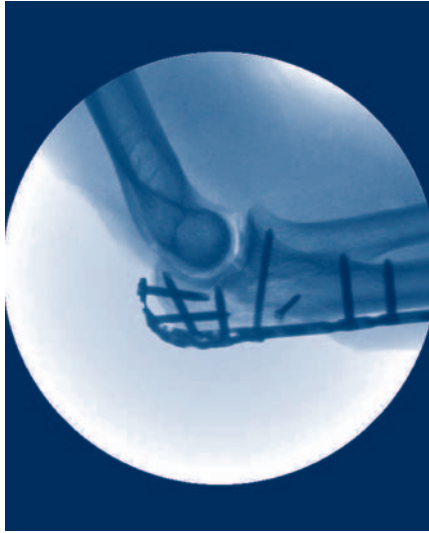


Image intensifier during surgery, lateral view



Postoperative (1 day after surgery), AP view



Preoperative, lateral view



Postoperative (10 days after surgery), lateral view



Postoperative (10 days after surgery), AP view

Implantation

Experience in the use of LCP plates or instruction from an experienced surgeon is recommended (see the Synthes Technique Guide for LCP Plates, Art.No. 036.000.019).

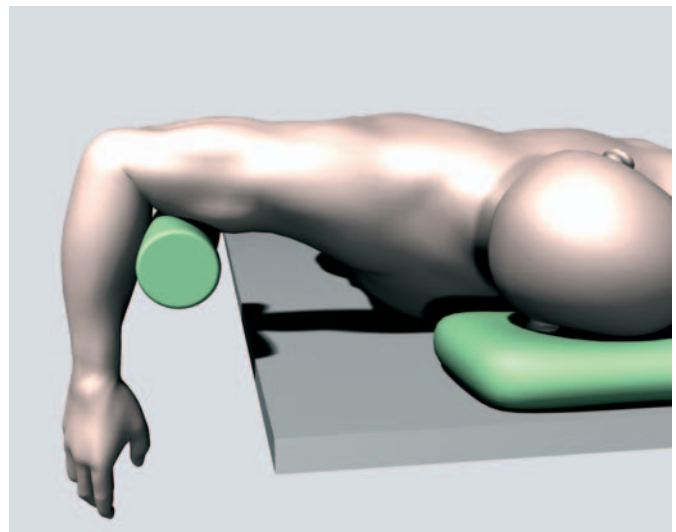
1

Position the patient

Place the patient either in the prone or the lateral position with the elbow flexed over a side rest. Depending on the fracture, use a posterior access up to approximately 5 cm distal from the supracondylar region.

The supine position with the forearm placed across the chest is an acceptable option, especially with extended approaches to the lateral pillar or column.

Note: The position is chosen by the surgeon depending on his or her preference.



2

Surgical approach

The incision runs posterior from the supracondylar area to a point 4 or 5 cm distal to the fracture. It can be slightly curved to the radial side to protect the ulnar nerve.

3

Reduce the fracture and provide temporary fixation

Reduce the fracture directly or indirectly depending on the type of fracture. Examine the reduction of the coracoid process to determine if it is correct before fixation.

Use Kirschner wires for temporary fixation.



4

Determine plate length and adapt the plate

Required instruments

329.150	Bending Pliers, length 230 mm
or	
329.081	2 Bending Irons for Reconstruction Plates
or	
329.040/050	Bending Iron
329.916	Bending Pin for LCP Plates 3.5
329.151	Cutting Pliers with Positioning Pin
or	
391.931	Cutting Pliers for Plates, length 230 mm

Select a plate length appropriate for the fracture.

For an optimum fit, the plate can be bent slightly to adapt to the shape of the bone.

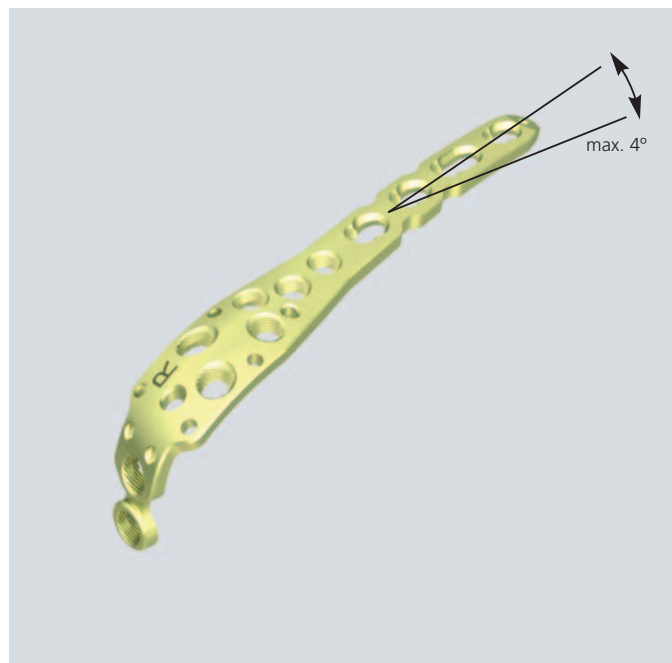
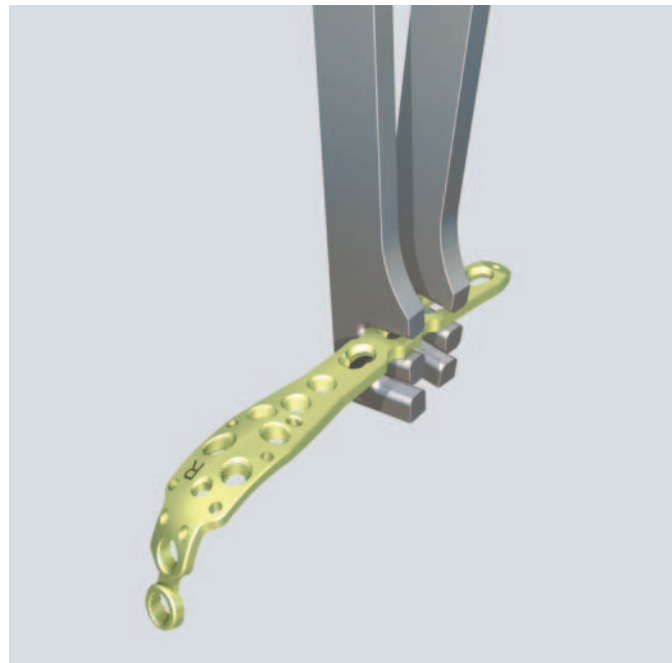
The plate can be bent at max. 4° at each notch in the plane of the shaft.

The tendon may have to be split in order to apply the plate from a posterior direction.

Evaluate whether or not the proximal tab should be used. If not, it can be cut off.

The tab can be bent for optimal screw positioning, using the bending pin.

Note: If the tab is bent, take care that the screw does not collide with proximal screws.



5

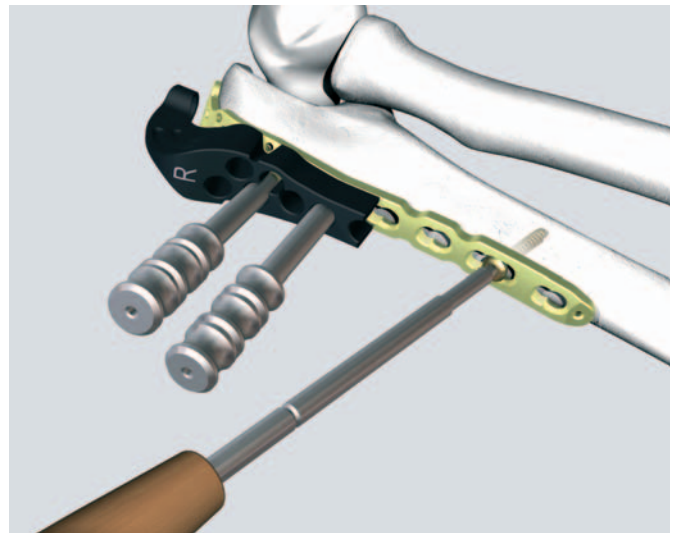
Attach the plate temporarily

Required instruments

312.910	Aiming Device for Olecranon Plate, right
312.911	Aiming Device for Olecranon Plate, left
323.053	Centering Sleeve 6.0/5.0, for PHILOS Aiming Device
323.054	Drill Sleeve 5.0/2.9, for PHILOS Aiming Device
323.055	Centering Sleeve for Kirschner Wire Ø 1.6 mm
● 314.030	Screwdriver Shaft, hexagonal or
● 314.116	Screwdriver Shaft, Stardrive T15

After adapting the plate, mount the aiming device, drill and centering sleeves on the proximal part of the plate.

Position the plate on the reduced bone, and attach it temporarily with a cortex screw Ø 3.5 mm.



6

Determine screw length for proximal part

Required instruments

323.060	PHILOS Direct Measuring Device for Kirschner Wire \varnothing 1.6 mm
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Alternative

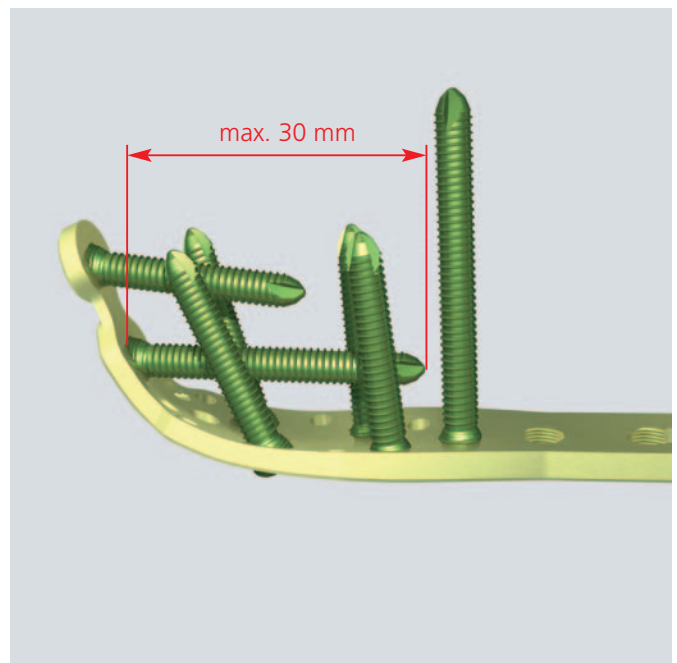
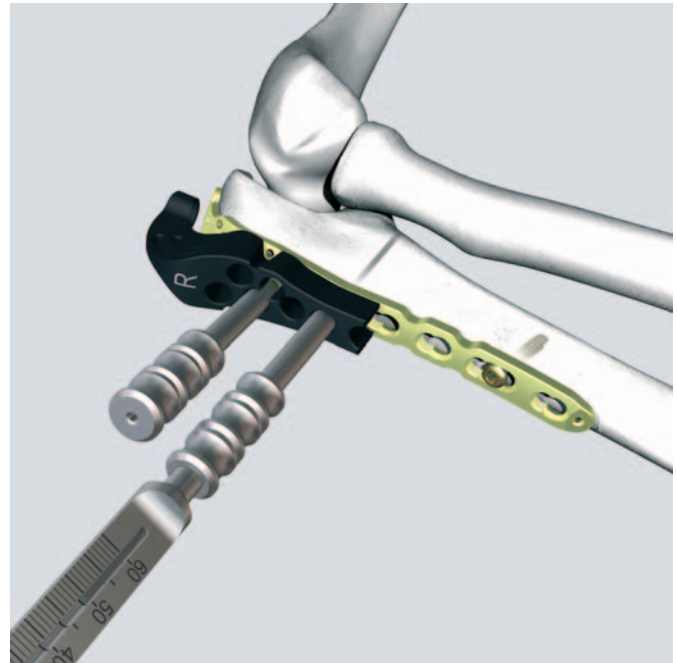
319.010	Depth Gauge
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Determine the screw position and length in the proximal region with a Kirschner wire and the direct measuring device.

- After positioning the plate, insert the Kirschner wire to the desired location using an image intensifier. Determine the length of the screw with the direct measuring device.

Alternative: Remove the Kirschner wire and centering sleeves, and determine the length of the screw hole with the depth gauge after drilling.

Note: If screws longer than 30 mm are used in the proximal part, they can collide with the shaft screws.



7

Drill screw hole and insert screw in proximal part

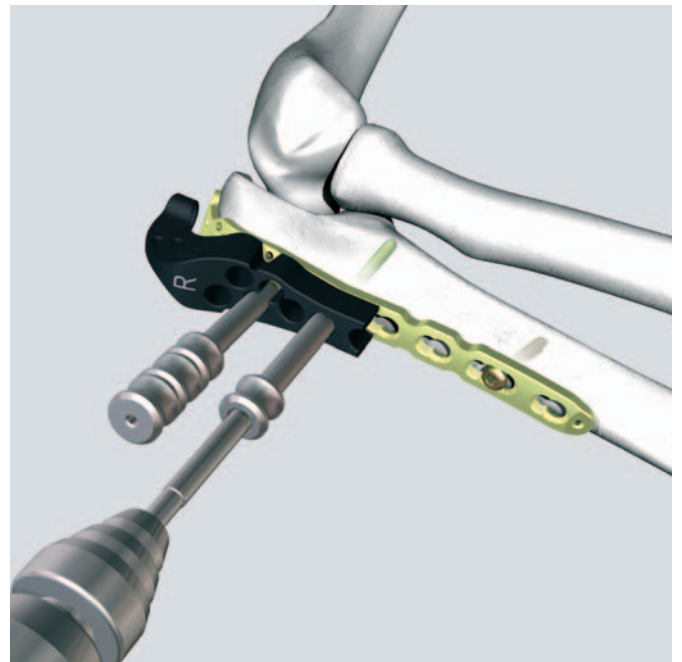
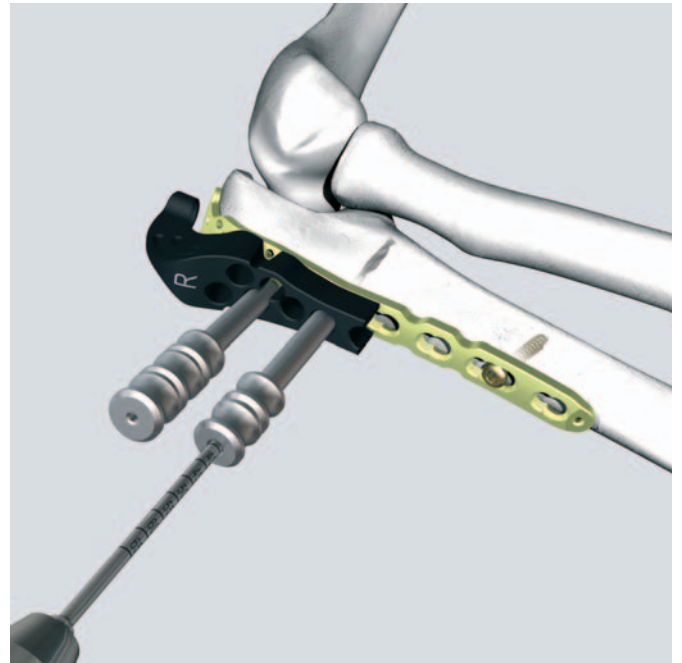
Required instruments

310.284	Drill Bit \varnothing 2.8 mm
511.770	Torque Limiter, 1.5 Nm, for Compact Air Drive and for Power Drive
or	
511.773	Torque Limiter, 1.5 Nm, for AO/ASIF Quick Coupling

Remove the centering sleeve. Pre-drill the screw hole with the drill bit. Remove the drill sleeve and drill bit.

Insert the screw manually or using a power tool. Always use the torque limiter to restrict the maximum torque. A distinct click can be heard when the maximum torque is reached, indicating a secure fit. Remove the screwdriver and centering sleeve.

Repeat steps 6 and 7 until all required proximal screws are inserted.



8

Insert the screws in the shaft area

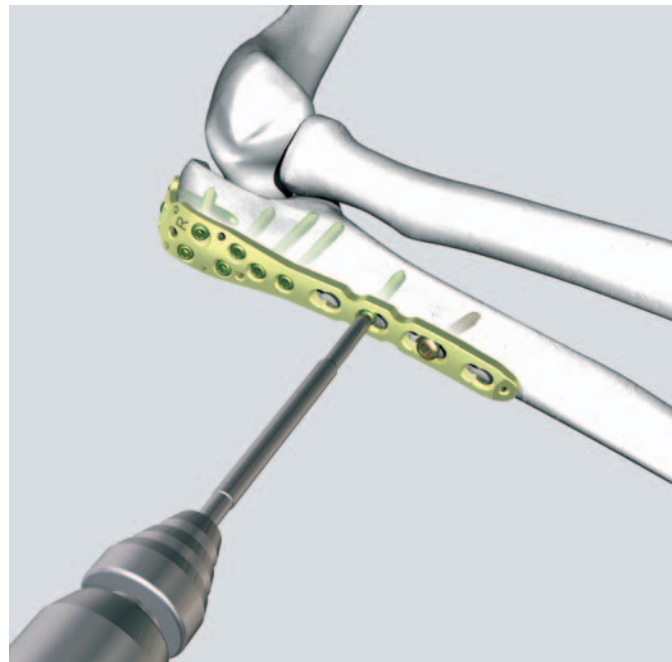
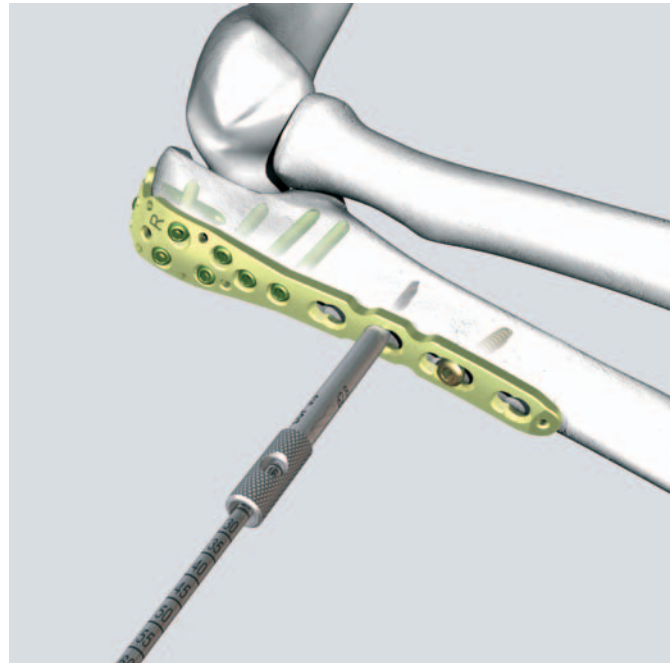
Required instruments

323.027	LCP Drill Sleeve
310.284	Drill Bit \varnothing 2.8 mm
319.010	Depth Gauge
511.770	Torque Limiter, 1.5 Nm, for Compact Air Drive and for Power Drive
or	
511.773	Torque Limiter, 1.5 Nm, for AO/ASIF Quick Coupling
● 314.030	Screwdriver Shaft, hexagonal
or	
● 314.116	Screwdriver Shaft, Stardrive T15

Carefully screw the LCP drill sleeve into the threaded part of the desired combination hole until the thread completely engages. Pre-drill the screw hole with the 2.8 mm drill bit. Determine the screw length with the depth gauge or scaled drill bit. Insert the screw as described in step 7.

Repeat this step until stable plate-bone fixation is achieved.

Note: If screws longer than 30 mm were used in the proximal part, they can collide with the shaft screws. See page 12.



Implant Removal

Required instruments

● 314.030	Screwdriver Shaft, hexagonal
or	
● 314.116	Screwdriver Shaft, Stardrive T15
309.521	Extraction Screw
311.430	Handle with Quick Coupling

To remove the plate, first unlock all the screws with the screwdriver. Remove the plate in a second step since it could otherwise rotate while unlocking the last screw, which can cause soft tissue damage.

If a screw cannot be removed with the screwdriver, use the handle with quick-coupling to insert the conical extraction screw into the screw head, and unscrew the screw in a counter-clockwise direction.

Important: For problem-free removal of an implant, the proper instruments must be available.

Implants

LCP Olecranon Plates 3.5


Stainless steel	Titanium	Number of shaft holes	Length mm	
236.502	436.502	2	86	right
236.504	436.504	4	112	right
236.506	436.506	6	138	right
236.508	436.508	8	164	right
236.510*	436.510*	10	190	right
236.512*	436.512*	12	216	right
236.503	436.503	2	86	left
236.505	436.505	4	112	left
236.507	436.507	6	138	left
236.509	436.509	8	164	left
236.511*	436.511*	10	190	left
236.513*	436.513*	12	216	left




All plates are available sterile packed. For sterile implants add suffix S to article number.


* Optional in sets 186.603/608/613/618.

Screws

X12.102-124  Locking Screw \varnothing 3.5 mm,
length 12-60 mm, self-tapping,
with Stardrive recess



X13.012-060  Locking Screw \varnothing 3.5 mm,
length 12-60 mm, self-tapping,
with hexagonal recess

X04.814-860  Cortex Screw \varnothing 3.5 mm,
length 14-60 mm, self-tapping,
with hexagonal recess



All screws are available sterile packed. For sterile implants
add suffix S to article number.

X=2: Stainless Steel

X=4: Titanium

Instruments

312.910 Aiming Device for Olecranon Plate, right



312.911 Aiming Device for Olecranon Plate, left



323.053 Centering Sleeve 6.0/5.0, for PHILOS Aiming Device



323.054 Drill Sleeve 5.0/2.9, for PHILOS Aiming Device



323.055 Centering Sleeve for Kirschner Wire
Ø 1.6 mm





Note: The Olecranon Plate is compatible with 3.5 LCP instruments and standard small-fragment instruments. These additional instruments are also required, although they are not shown here.

X-ray Template



034.000.470 Template for LCP Olecranon Plate

Elbow Sets

LCP Elbow Plate System with Screws \varnothing 2.7/3.5 mm, without Plates, in Vario Case

	 Stardrive recess	 Hexagonal recess
Stainless Steel	186.610	186.600
Titanium	186.615	186.605

LCP Olecranon and LCP DMH Plate System with Screws \varnothing 3.5 mm, without Plates, in Vario Case

	 Stardrive recess	 Hexagonal recess
Stainless Steel	186.611	186.601
Titanium	186.616	186.606

Elbow Set Inserts for Vario Case (686.600) with plates and special instruments

186.603	Insert for LCP Olecranon and LCP DMH plates (Stainless Steel)
186.608	Insert for LCP Olecranon and LCP DMH plates (Titanium)

LCP Olecranon and LCP DMH Plate-only Vario Case (only plates and special instruments without screws)

186.613	LCP Olecranon and LCP DMH plates (Stainless Steel)
186.618	LCP Olecranon and LCP DMH plates (Titanium)

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Tejwani NC, Garnham IR. Posterior olecranon plating: Biomechanical and clinical evaluation of a new operative technique. *Bull Hosp Jt Dis*. 2002-2003; 61 (1-2): 27–31.

Ring D, Gulotta L, Roy A, Jupiter JB. Concomitant nonunion of the distal humerus and olecranon. *J South Orthop Assoc*. 2003 Spring; 12 (1): 27–31.

Boyer MI, Galatz LM, Borrelli J Jr, Axelrod TS, Ricci WM. Intra-articular fractures of the upper extremity: New concepts in surgical treatment. *Instr Course Lect*. 2003; 52: 591–605.



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