Surgical Technique

smith&nephew

PERI-LOC◇

Locked Plating System

Distal Humerus Locking Plate



PERI-LOC◇ Locked Plating System

Distal Humerus Locking Plate Surgical Technique

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Nota Bene

The technique description herein is made available to the healthcare professional to illustrate the author's suggested treatment for the uncomplicated procedure. In the final analysis, the preferred treatment is that which addresses the needs of the specific patient.

Introduction

The PERI-LOC® Locked Plating System combines the advantages of locked plating with the versatility and benefits of traditional plates and screws. Utilizing both locking and non-locking screws, the PERI-LOC system allows for the creation of a fixed-angle construct capable of resisting angular collapse. Its enhanced stability also allows it to function as an effective fracture reduction aid.

A simple, intuitive instrument set featuring standardized drill bits and screwdrivers along with color-coded drill guides, helps make the PERI-LOC system efficient and easy to use.

The PERI-LOC Distal Humerus Locking Plates are available in a variety of sizes and options and are compatible with both the PERI-LOC Small Fragment and the Elbow/2.7mm Instrument and Implant Sets. Their precise screw trajectories, anatomic contour and locking/non-locking capabilities provide a stable construct for predictable reconstruction of complex fractures of the distal humerus.



Indications

The PERI-LOC◇ Distal Humerus Locking Plates are indicated for fixation of fractures, non-unions and osteotomies of the humerus.



Plate Features

- Three plates: medial, lateral and posterolateral
- Plate options allow for both 90°-90° and 180° plating techniques
- Recon plate segments facilitate additional contouring if necessary
- Left/right-specific
- 316L stainless steel for strength
- Locking/non-locking option in all screw holes
- Shaft screw holes accept 3.5mm Locking and 3.5mm Cortex Screws
- Distal articular holes accept 2.7mm Locking and 2.7mm Cortex Screws



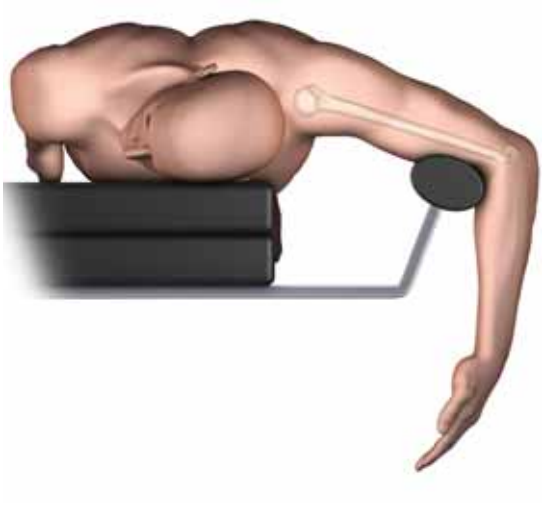
Medial **Lateral** **Posterolateral**

Surgical Technique

Patient Positioning

Place the patient in the lateral or prone position on a radiolucent table. Support the affected limb with a bolster or an elevated arm board placed parallel to the table. Lateralize the patient on the table to permit unimpeded mobility of the humerus.





Incision

A curvilinear posterior incision is made along the radial border of the olecranon. Isolate and protect the ulnar nerve as necessary. The articular surface is exposed through either a triceps split or chevron olecranon osteotomy. Care should be taken to preserve any soft tissue attachments to fracture fragments.



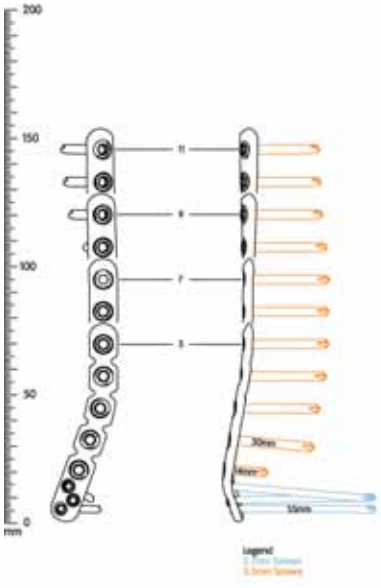
Fracture Reduction and Provisional Fixation

Reduce and provisionally fix the articular surface under fluoroscopy with K-Wires and/or Reduction Forceps. Provisionally fix the reduced articular block to the shaft in the same manner. Reduction aids should be placed so as not to interfere with final plate placement.

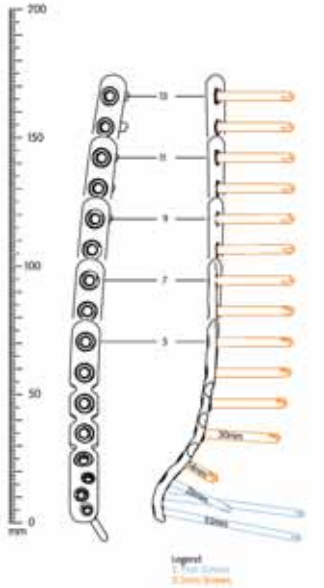
Plate Selection

Following fracture reduction, select the Distal Humerus Locking Plates that best accommodate patient anatomy and fracture pattern. It is recommended to select plates of different length in order to reduce the risk of a diaphyseal stress riser.

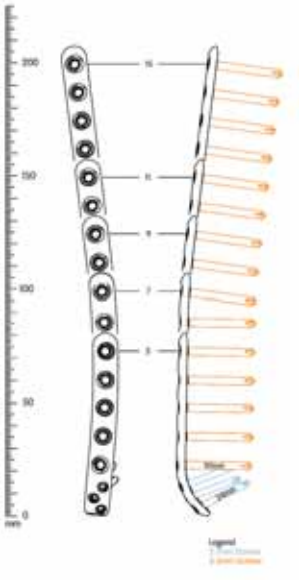
Note The PERI-LOC◇ Distal Humerus Locking Plate Preoperative Templates (7118-0977, 7118-0978, 7118-0979) are available to assist with preoperative radiographic planning.



PERI-LOC Lateral Distal Humerus Locking Plate Preoperative Template Cat. No. 7118-0977



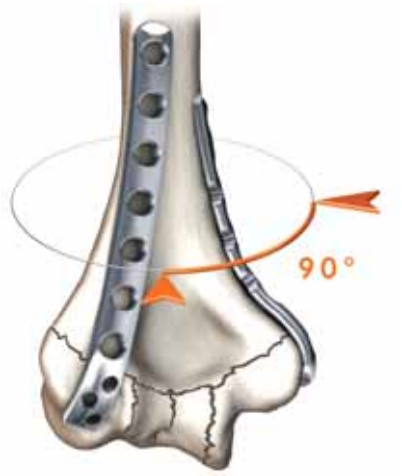
PERI-LOC Medial Distal Humerus Locking Plate Preoperative Template Cat. No. 7118-0978



PERI-LOC Posterolateral Distal Humerus Locking Plate Preoperative Template Cat. No. 7118-0979

Plate Selection

90°-90° Technique
This construct involves application of the medial distal humerus plate to the medial column and the posterolateral plate to the lateral.



180° Technique
This construct involves application of the medial distal humerus plate to the medial column and the lateral distal plate to the lateral.

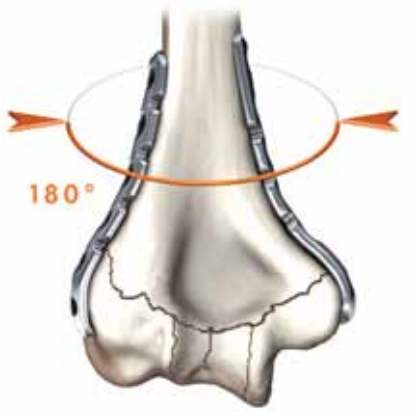


Plate Positioning

Medial Plate
The plate rests along the medial ridge of the distal humerus extending distally to the insertion point of the medial collateral ligament.



Posterolateral Plate
The plate rests along the posterolateral aspect of the distal humerus with its most distal part covering the edge of the capitulum just lateral to the insertion point of the lateral collateral ligament.



Lateral Plate
The plate rests along the lateral ridge of the distal humerus extending distally around the lateral epicondyle to the insertion point of the lateral collateral ligament.



Reduce the fracture beginning with the least comminuted column. Confirm coronal and sagittal alignment along with plate position on the shaft. Provisionally fix the plate to the bone using one 2.7mm x 18mm Provisional Fixation Pin (7117-3322). Alternatively, Fracture Reduction Forceps may be used. Proceed with application of the second plate to the other column. Reconfirm alignment and plate placement.

Distal 2.7mm screw trajectory may be confirmed by threading a 2.0mm Locking Drill Guide into a distal screw hole and inserting a 2.0mm K-Wire to the desired depth.



Plate Contouring

Occasionally, minor plate contouring is required prior to implantation. If necessary, this may be accomplished with Bending Irons (7117-3482).

Note Avoid excessive plate contouring as this can alter screw trajectory to the point that certain screw holes cannot be used due to the risk of screw interdigitation.

Screw Insertion

2.7mm Locking Screw
Thread the 2.7mm Locking Screw Guide (7117-3452) with 2.0mm Locking Drill Guide Insert (7117-3449)* into the desired screw hole and drill accordingly with the 2.0mm Short Drill Bit (7117-3555).

Measure for screw length by reading the exposed calibrations off the drill bit or by using the 2.7mm Screw Depth Gauge (7117-3525).



Attach the 2.5mm Hexdriver Shaft w/AO Quick Connect (7117-3535) to the Large Screwdriver Handle (7117-3547) and insert the appropriate length 2.7mm Self-Tapping Locking Screw**. Avoid insertion of screws that are too long as this increases the risk of interdigitation with screws from the opposite side.



Note Locking screws may be inserted on power, but should always be tightened by hand in order to avoid loss of reduction, stripping of the screw head or damage to the screwdriver.

* The 2.0mm Locking Drill Guide (7117-3448) may be substituted for the 2.7mm Locking Screw Guide with 2.0mm Locking Drill Guide Insert
** Screws may be inserted through the 2.7mm Drill Guide assembly, but it must be removed prior to insertion of a screw less than 24mm in length

2.7mm Cortex Screw
Insert the Universal Drill Guide Handle (7117-3349) with 2.0mm Neutral Locking Hole Insert (7117-3453) into the desired screw hole and drill accordingly with the 2.0mm Short Drill Bit.



Measure for screw length by reading the exposed calibrations off the drill bit or by using the 2.7mm Screw Depth Gauge.



Insert the appropriate length 2.7mm Self-Tapping Cortex Screw using the 2.5mm Hexdriver/Screwdriver Handle assembly.

Note If non-locking screws are to be used in the plate to gain compression, it is preferred that that they be inserted prior to any locking screws.



3.5mm Locking Screw
Thread the 3.5mm Locking Drill Guide (7117-3538) with 2.7mm Locking Drill Guide Insert (7117-3529)* into the desired screw hole and drill both cortices with the 2.7mm Drill Bit (7117-3503).

Measure for screw length by reading the exposed calibrations off the drill bit or by using the 3.5mm Short Screw Depth Gauge (7117-3523).



Attach the 3.5mm Hexdriver w/AO Quick Connect (7117-3537) to the Large Screwdriver Handle (7117-3547) and insert the appropriate length 3.5mm Self-Tapping Locking Screw**. Avoid insertion of screws that are too long as this increases the risk of interdigitation with screws from the opposite side.



Note Locking screws may be inserted on power, but should always be tightened by hand in order to avoid loss of reduction, stripping of the screw head or damage to the screwdriver.

* The 2.7mm Locking Drill Guide-One Piece may be substituted for the 3.5mm Locking Drill Guide with 2.7mm Locking Drill Guide Insert
** Screws may be inserted through the 3.5mm Drill Guide assembly, but it must be removed prior to insertion of a screw less than 24mm in length

3.5mm Cortex Screw
Insert the Universal Drill Guide Handle (7117-3349) with 2.7mm Neutral Locking Hole Insert (7117-3514) into the desired screw hole and drill accordingly with the 2.7mm Drill Bit.



Measure for screw length by reading the exposed calibrations off the drill bit or by using the 3.5mm Short Screw Depth Gauge.



Insert the appropriate length 3.5mm Self-Tapping Cortex Screw using the 3.5mm Hexdriver/Screwdriver Handle assembly. Fill remaining screw holes as desired.

Note If non-locking screws are to be used in the plate to gain compression, it is advised that they be inserted prior to any locking screws.



Closure

Obtain final radiographic images to confirm screw placement and fracture reduction. Wound closure follows standard technique.



Catalog Information



PERI-LOC® Small Fragment Instrument, Implant and Disposables Set

Set No. 7181-0220

Instrument Cases

Cat. No.	Description
7112-9400	Large Outer Case
7112-9402	Lid for Outer Case
7117-0350	Small Fragment Drill Guide Caddy
7117-0352	Small Fragment Straight Locking Plate Caddy
7117-0353	Small Fragment Straight Plate Caddy
7117-0354	Small Fragment Screw Caddy
7117-0359	Small Fragment Drill Caddy
7117-0361	Small Fragment Instrument Tray

Instruments

Cat. No.	Description	Tray Qty
7117-0043	Sharp Hook	1 ea
7117-0045	Screw Forceps	1 ea
7117-0057	Hohmann Retractor, 8mm	2 ea
7117-0063	Wire Bending Pliers, 140mm	1 ea
7117-0076	Bending Pliers for 2.7mm & 3.5mm Plates	1 ea
7117-0095	Hohmann Retractor, 15mm	2 ea
7117-0097	Periosteal Elevator	1 ea
7117-0175	Bending Pliers for 3.5mm Reconstruction Plates	1 ea
7117-3344	Countersink	1 ea
7117-3349	Universal Drill Guide Handle	2 ea
7117-3369	Hohmann Retractor, Bent, 8mm	2 ea
7117-3370	Reduction Forceps w/Ratchet, 205mm	2 ea
7117-3377	Reduction Forceps w/Points, Broad	2 ea
7117-3378	Reduction Forceps w/Serrated Jaw	2 ea
7117-3482	Small Fragment Bending Irons	2 ea
7117-3487	3.5mm Self-Retaining Hexdriver Shaft w/AO Quick Connect, 178mm	2 ea
7117-3510	2.7mm Drill Guide Insert	2 ea
7117-3511	2.7mm Compression Slot Insert	1 ea
7117-3512	2.7mm Neutral Slot Insert	1 ea
7117-3513	3.5mm Drill Guide Insert	2 ea
7117-3514	2.7mm Neutral Locking Hole Insert	1 ea
7117-3515	2.7mm Compression Locking Hole Insert	1 ea
7117-3516	2.0mm Parallel Wire Drill Guide	1 ea
7117-3517	2.0mm Wire/Drill Insert	1 ea
7117-3523	Short 3.5mm Screw Depth Gauge	1 ea
7117-3525	2.7mm Screw Depth Gauge	1 ea
7117-3527	Cannulated K-Wire Bending Iron	1 ea
7117-3528	Cannulated AO-to-Trinkle Adaptor	1 ea
7117-3529	2.7mm Locking Drill Guide Insert	4 ea
7117-3534	3.5mm Screw Depth Gauge	1 ea

Catalog Information

Instruments (continued)

Cat. No.	Description	Tray Qty
7117-3535	2.5mm Hexdriver Shaft w/AO Quick Connect	2 ea
7117-3538	3.5mm Locking Screw Guide	4 ea
7117-3542	Small T-Handle w/AO Quick Connect	1 ea
7117-3543	Teardrop Handle Screwdriver w/AO Quick Connect	1 ea
7117-3544	Self-centering Reverse Verbrugge Forceps, 190mm	1 ea
7117-3547	Large Screwdriver Handle w/AO Quick Connect	1 ea
7117-3549	Small Fragment Guide Removal Assembly	1 ea

Optional Instruments

Cat. No.	Description	Tray Qty
7117-3488	3.5mm Self-Retaining Hexdriver Shaft w/AO Quick Connect, 119mm	1 ea
7117-3450	2.7mm Locking Drill Guide-One Piece	1 ea

Disposables

Cat. No.	Description	Tray Qty
7116-1012	1.25mm x 150mm K-Wire w/Trocar Point	6 ea
7116-1016	1.6mm x 150mm K-Wire w/Trocar Point	6 ea
7116-1020	2.0mm K-Wire w/Trocar Point	6 ea
7117-3318	3.5mm Tap w/AO Quick Connect	2 ea
7117-3366	2.7mm Tap w/AO Quick Connect	2 ea
7117-3386	4.0mm Tap w/AO Quick Connect	2 ea
7117-3322	2.7mm x 18mm Provisional Fixation Pin	4 ea
7117-3323	2.7mm x 40mm Provisional Fixation Pin	4 ea
7117-3501	2.0mm Calibrated Drill Bit w/AO Quick Connect, 190mm	2 ea
7117-3555	2.0mm Short Calibrated Drill Bit w/AO Quick Connect, 93mm	2 ea
7117-3502	2.7mm Short Calibrated Drill Bit w/AO Quick Connect, 155mm	2 ea
7117-3503	2.7mm Calibrated Drill Bit w/AO Quick Connect, 220mm	2 ea
7117-3504	3.5mm Short Calibrated Drill Bit w/AO Quick Connect, 155mm	2 ea

Implants

2.7mm Self-Tapping Cortex Screws

Cat. No.	Length	Cat. No.	Length	Cat. No.	Length
7182-3010	10mm	7182-3026	26mm	7182-3045	45mm
7182-3012	12mm	7182-3028	28mm	7182-3050	50mm
7182-3014	14mm	7182-3030	30mm	7182-3055	55mm
7182-3016	16mm	7182-3032	32mm	7182-3060	60mm
7182-3018	18mm	7182-3034	34mm	7182-3065	65mm
7182-3020	20mm	7182-3036	36mm	7182-3070	70mm
7182-3022	22mm	7182-3038	38mm		
7182-3024	24mm	7182-3040	40mm		

3.5mm Self-Tapping Cortex Screws

Cat. No.	Length
7182-4010	10mm
7182-4012	12mm
7182-4014	14mm
7182-4016	16mm
7182-4018	18mm
7182-4020	20mm
7182-4022	22mm
7182-4024	24mm
7182-4026	26mm
7182-4028	28mm

Cat. No.	Length
7182-4030	30mm
7182-4032	32mm
7182-4034	34mm
7182-4036	36mm
7182-4038	38mm
7182-4040	40mm
7182-4045	45mm
7182-4050	50mm
7182-4055	55mm
7182-4060	60mm

Cat. No.	Length
7182-4065	65mm
7182-4070	70mm
7182-4075	75mm
7182-4080	80mm
7180-4085*	85mm
7180-4090*	90mm
7180-4095*	95mm
7180-4100*	100mm
7180-4105*	105mm
7180-4110*	110mm

3.5mm Self-Tapping Locking Screws

Cat. No.	Length
7182-5010	10mm
7182-5012	12mm
7182-5014	14mm
7182-5016	16mm
7182-5018	18mm
7182-5020	20mm
7182-5022	22mm
7182-5024	24mm
7182-5026	26mm
7182-5028	28mm

Cat. No.	Length
7182-5030	30mm
7182-5032	32mm
7182-5034	34mm
7182-5036	36mm
7182-5038	38mm
7182-5040	40mm
7182-5045	45mm
7182-5050	50mm
7182-5055	55mm
7182-5060	60mm

Cat. No.	Length
7182-5065	65mm
7182-5070	70mm
7182-5075	75mm
7182-5080	80mm
7180-5085*	85mm
7180-5090*	90mm
7180-5095*	95mm
7180-5100*	100mm
7180-5105*	105mm
7180-5110*	110mm

4.0mm Cancellous Screws, Fully Threaded

Cat. No.	Length
7182-5210	10mm
7182-5212	12mm
7182-5214	14mm
7182-5216	16mm
7182-5218	18mm
7182-5220	20mm
7182-5222	22mm
7182-5224	24mm
7182-5226	26mm
7182-5228	28mm

Cat. No.	Length
7182-5230	30mm
7182-5232	32mm
7182-5234	34mm
7182-5236	36mm
7182-5238	38mm
7182-5240	40mm
7182-5245	45mm
7182-5250	50mm
7182-5255	55mm
7182-5260	60mm

Cat. No.	Length
7182-5265	65mm
7182-5270	70mm
7182-5275	75mm
7182-5280	80mm
7180-5285*	85mm
7180-5290*	90mm
7180-5295*	95mm
71800-5300*	100mm

* Available sterile only

Catalog Information

4.0mm Cancellous Screws, Partially Threaded

Cat. No.	Length
7182-5310	10mm
7182-5312	12mm
7182-5314	14mm
7182-5316	16mm
7182-5318	18mm
7182-5320	20mm
7182-5322	22mm
7182-5324	24mm
7182-5326	26mm
7182-5328	28mm

Cat. No.	Length
7182-5330	30mm
7182-5332	32mm
7182-5334	34mm
7182-5336	36mm
7182-5338	38mm
7182-5340	40mm
7182-5345	45mm
7182-5350	50mm
7182-5355	55mm
7182-5360	60mm

Cat. No.	Length
7182-5365	65mm
7182-5370	70mm
7182-5375	75mm
7182-5380	80mm
7180-5385*	85mm
7180-5390*	90mm
7180-5395*	95mm
7180-5400*	100mm

Washer, 7.0mm Outer Diameter

Cat. No. 7114-3107



PERI-LOC◇ Elbow/2.7mm Locking Plate Tray

Set No. 7181-1005

Instrument Cases

Cat. No.	Description
7112-9400	Large Outer Case
7112-9402	Lid for Outer Case
7117-0397	Elbow Locking Plate Tray
7117-0399	2.7mm Instrument & Screw Tray
7117-0373	2.7mm Drill Guide Caddy
7117-0374	2.7mm Self-Tapping Cortex Locking Screw Caddy

Instruments

Cat. No.	Description	Tray Qty
7117-3455	2.7mm Screw Guide Remover	1 ea
7117-3448	2.0mm Locking Drill Guide	2 ea
7117-3452	2.7mm Locking Screw Guide	2 ea
7117-3449	2.0mm Locking Drill Guide Insert	2 ea
7117-3453	2.0mm Neutral Locking Hole Insert	1 ea

* Available sterile only

Implants

2.7mm Self-Tapping Locking Screws

Cat. No.	Length
7182-2310	10mm
7182-2312	12mm
7182-2314	14mm
7182-2316	16mm
7182-2318	18mm
7182-2320	20mm
7182-2322	22mm

Cat. No.	Length
7182-2324	24mm
7182-2326	26mm
7182-2328	28mm
7182-2330	30mm
7182-2332	32mm
7182-2334	34mm
7182-2336	36mm

Cat. No.	Length
7182-2338	38mm
7182-2340	40mm
7182-2345	45mm
7182-2350	50mm
7182-2355	55mm
7182-2360	60mm

Lateral Distal Humerus Locking Plates

Cat. No.	Description	Length
7182-2405	5H, Left	77mm
7182-2407	7H, Left	102mm
7182-2409	9H, Left	128mm
7182-2411	11H, Left	153mm
7182-2505	5H, Right	77mm
7182-2507	7H, Right	102mm
7182-2509	9H, Right	128mm
7182-2511	11H, Right	153mm

Posterolateral Distal Humerus Locking Plates

Cat. No.	Description	Length
7182-2605	5H, Left	80mm
7182-2607	7H, Left	107mm
7182-2609	9H, Left	132mm
7182-2611	11H, Left	157mm
7182-2615	15H, Left	207mm
7182-2705	5H, Right	80mm
7182-2707	7H, Right	107mm
7182-2709	9H, Right	132mm
7182-2711	11H, Right	157mm
7182-2715	15H, Right	207mm

Medial Distal Humerus Locking Plates

Cat. No.	Description	Length
7182-1905	5H, Left	79mm
7182-1907	7H, Left	103mm
7182-1909	9H, Left	127mm
7182-1911	11H, Left	151mm
7182-1913	13H, Left	174mm
7182-1805	5H, Right	79mm
7182-1807	7H, Right	103mm
7182-1809	9H, Right	127mm
7182-1811	11H, Right	151mm
7182-1813	13H, Right	174mm



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