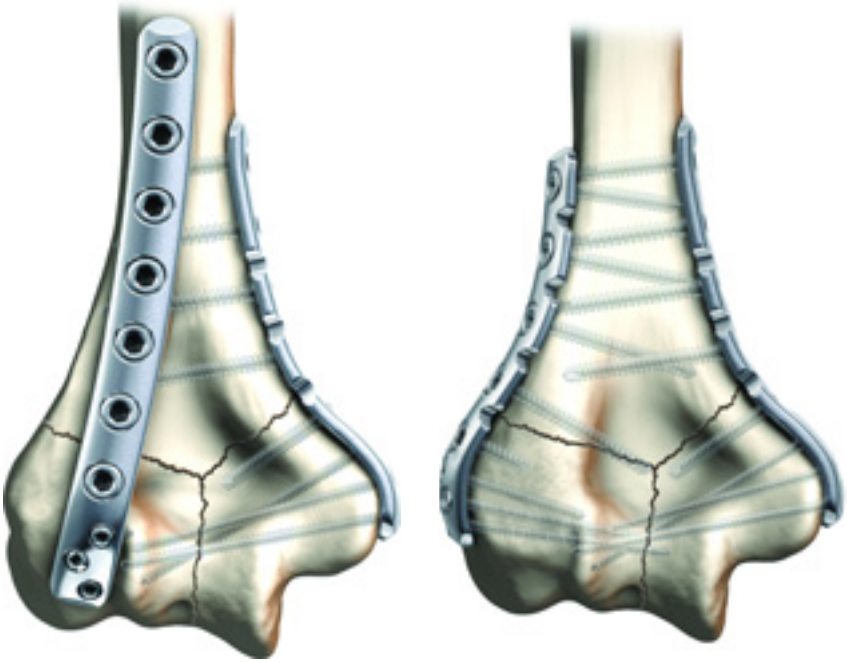
Surgical Technique
International Version

smith&nephew

PERI-LOC◇

Upper Extremity
Locked Plating System

Distal Humerus Locking Plate



PERI-LOC◇ Upper Extremity Locked Plating System

Distal Humerus Surgical Technique

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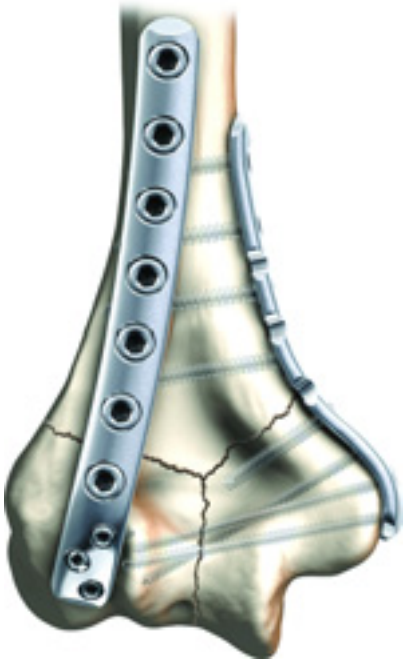
Nota Bene
The technique description herein is made available to the healthcare professional to illustrate the author's suggested treatment for the uncomplicated procedure. In the final analysis, the preferred treatment is that which addresses the needs of the specific patient.

Introduction

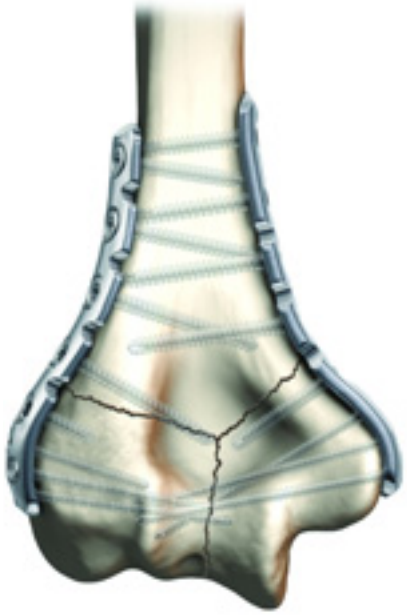
PERI-LOC◇ Locked Plating System Overview

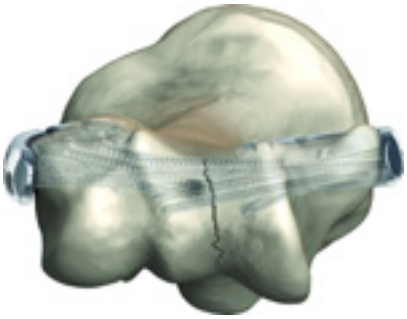
The PERI-LOC Locked Plating System combines the advantages of locked plating with the flexibility and benefits of traditional plates and screws. Utilising both locking and non-locking screws, the PERI-LOC system allows for the creation of a construct that resists angular collapse and also functions as an effective fracture reduction aid. A simple, intuitive instrument set featuring standardised drill bits, screwdrivers, and colour coded drill guides helps make the PERI-LOC system efficient and easy to use.

The precise screw trajectories, anatomic contour, and locking capabilities of the PERI-LOC Distal Humerus Plates provide a stable construct for predictable reconstruction of complex fractures of the humerus.

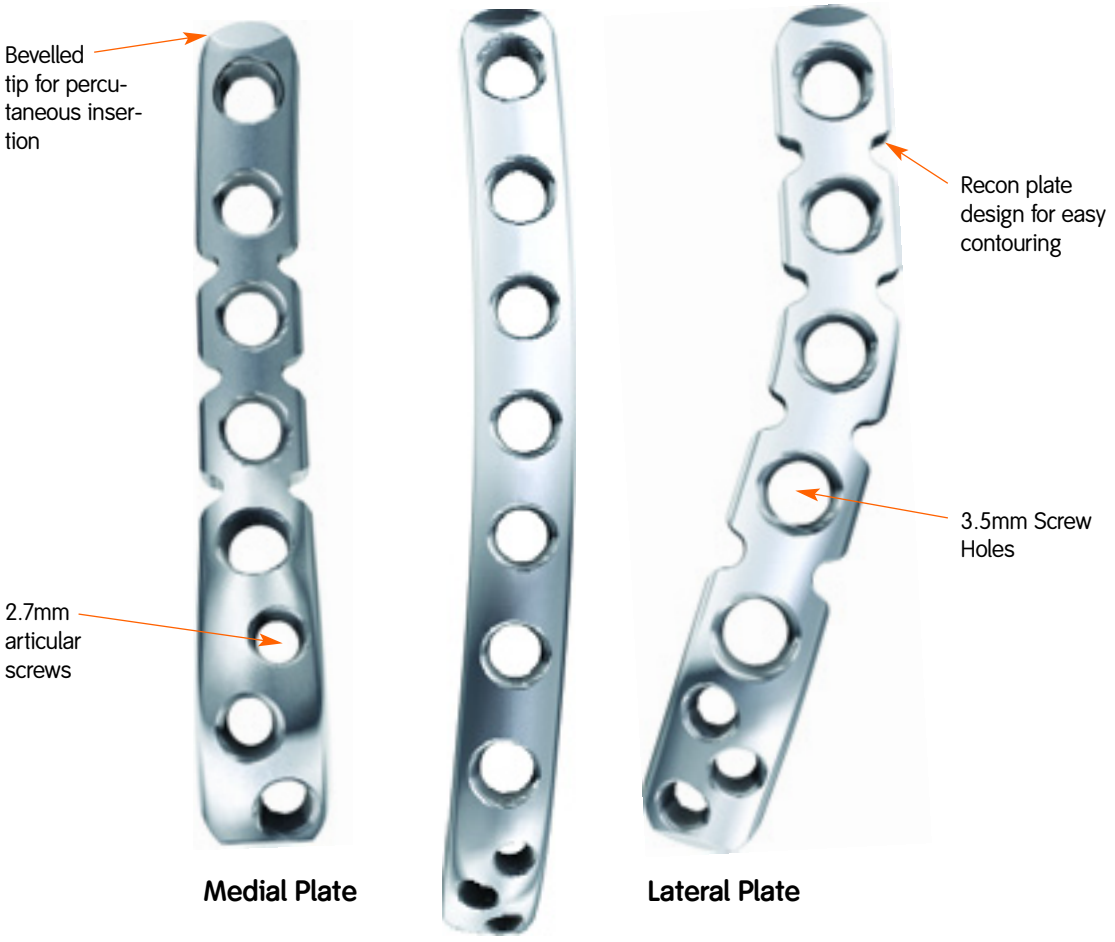


- Three (3) plate options: Lateral, Medial, and Posterolateral
- Low profile plate and screws reduce the potential for soft tissue and tendon irritation
- Compression-to-recon plate profile transition facilitates additional intraoperative contouring
- System configuration allows for either 90°- 90° or 180° plating techniques
- Left and right specific plates available in a variety of lengths for precise implant contour
- 316L stainless steel for strength
- Bevelled plate tip for percutaneous insertion
- 2.7mm distal locking screws provide optimal, low profile articular fixation
- Curved plate design maximises shaft coverage while avoiding sensitive neuro-anatomy
- Locking and non-locking option in every hole for custom screw configurations





Implant Features



Every threaded hole can accept a locking or non-locking screw:

2.7mm Self-tapping Cortex Screw (Non-locking)
Cat. No. 7180-30XX

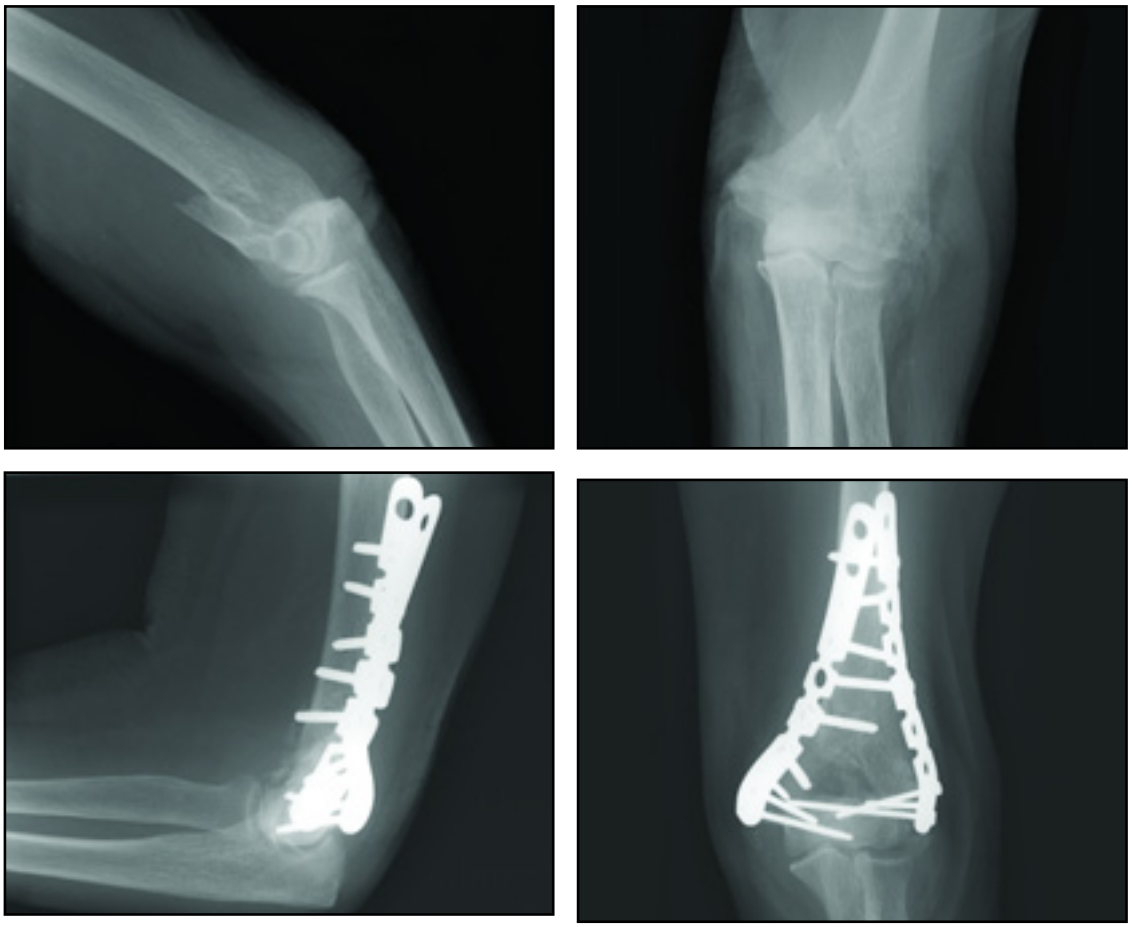
2.7mm Locking Self-tapping Cortex Screw
Cat. No. 7180-23XX

Indications

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

Distal Humerus Case Example

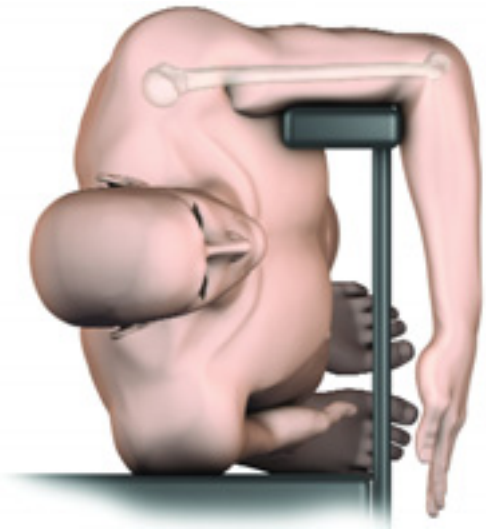
Case 1

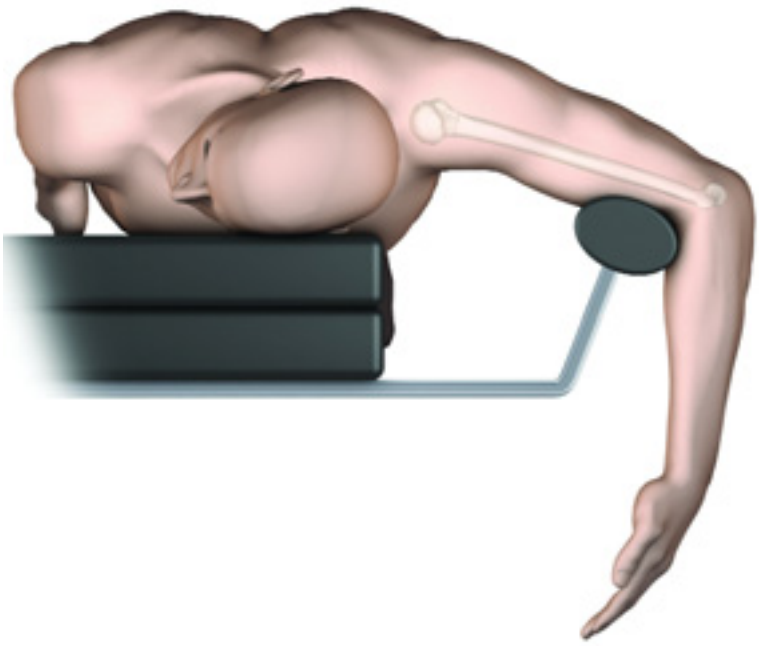


Surgical Technique

Patient Positioning

The patient may be placed in either the lateral, prone, or supine position with the involved limb supported over bolsters or an elevated arm board placed parallel to the table. A radiolucent table and arm board are preferable so as not to impede fluoroscopy.





Incision

A straight, posterior longitudinal incision is made curving just lateral to the olecranon process. Full thickness skin flaps are developed medially and laterally. The method for exposing the articular surface depends upon the degree of articular comminution present and surgeon preference. Exposure of the articular fracture fragments is typically accomplished by either an Olecranon Osteotomy or a Triceps Split. These approaches may provide improved access to the distal humerus and decrease some of the complications associated with comminuted fractures.

Fracture Reduction and Provisional Fixation

After exposure and debridement of the fracture site, the fracture is reduced and provisionally fixed under fluoroscopy with K-wires, reduction forceps or suture fixation. Reduction aids should be placed so as not to interfere with placement of the plate. The PERI-LOC® Distal Humerus Plates may also be used as reduction tools due to their anatomical contour and locking/non-locking screw options.

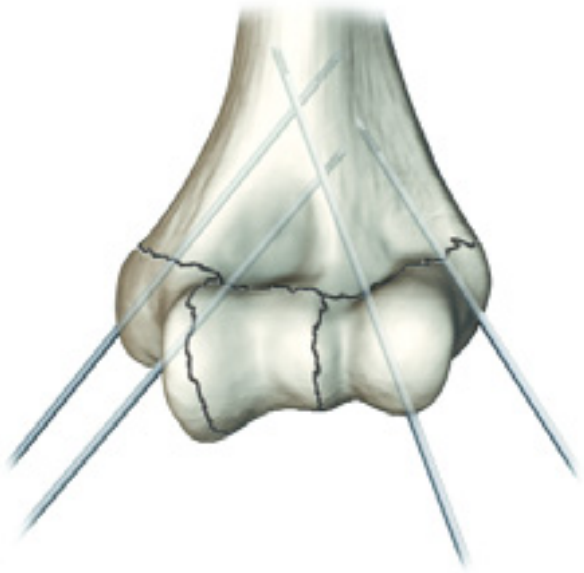


Plate Selection

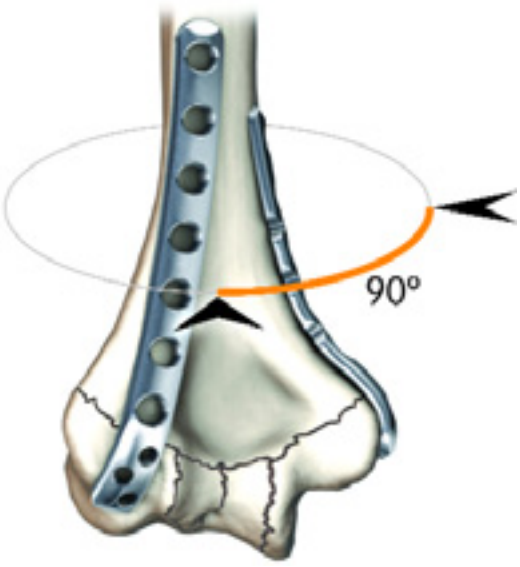
The appropriate plate is selected following fracture reduction. In general, the least comminuted column of the humerus should be reduced and fixed prior to the more comminuted one. Fixation of distal humerus fractures is typically achieved via a dual plate construct. The PERI-LOC° Distal Humerus Plating System offers three anatomically designed plates: Medial, Lateral and Posterolateral, which may be configured into 90°- 90° or 180° constructs depending on the fracture pattern or surgeon preference.

Medial

Posterolateral

Lateral

Technique #1: The 90°- 90° approach involves application of the Medial Distal humeral plate to the medial column and the Posterolateral Distal humeral plate to the lateral column.



Technique #2: The 180° approach involves application of the Medial Distal humeral plate to the medial column and the Lateral Distal humeral plate to the lateral column.

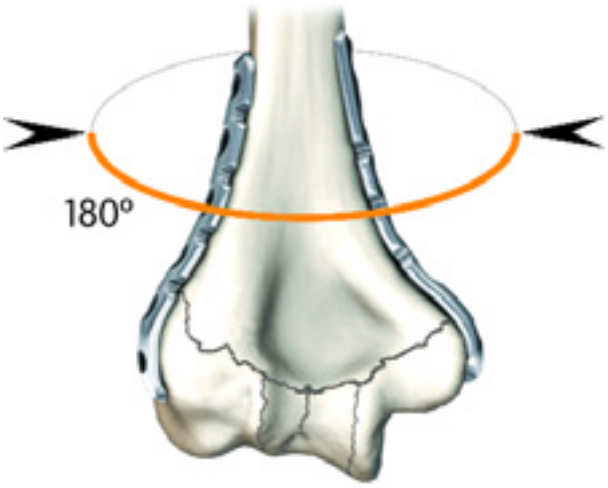


Plate Positioning

Plate position on the distal humerus will be dictated by fracture pattern and/or patient anatomy and will differ according to the plating configuration that was selected. Reduce the fracture manually beginning with the least comminuted column and confirm coronal and sagittal alignment along with plate position on the shaft. Proceed with application of the second plate to the humerus followed by confirmation of reduction and plate position. Provisionally fix each plate to the proximal and distal fracture fragments with Reduction Forceps, K-wires and 2.7mm Provisional Fixation Pins.

Note: It is imperative that the articular surface of the distal humerus be reduced prior to definitive fixation with any plates and screws.

Screw Insertion

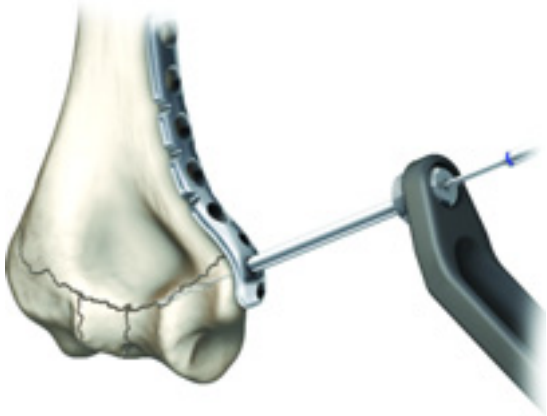
To visualise screw trajectories in the 2.7mm distal locking holes, thread the 2.0mm Locking Drill Guide into a screw hole and insert a 2.0mm K-wire under fluoroscopy. The resultant image is representative of the screw's final trajectory. Proceed with definitive fixation using appropriate screw selections as detailed by the screw insertion techniques listed to follow.

Tips:

- If non-locking screws are to be inserted into a plate to gain compression, it is preferred that they be inserted prior to any locking screws.
- If either the 3.5mm Locking Screw Guide with 2.7mm Locking Drill Guide Insert or 2.7mm Locking Screw Guide with 2.0mm Locking Drill Guide Insert are used, remove the Drill Guide Insert before inserting the appropriate length screw through the slotted Outer Sleeve. *Note that the entire Drill Guide assembly must be removed before inserting a screw less than 24mm in length.* Advance the screw with the appropriate Hexdriver until the black laser etched marks are at the top of the Outer Sleeve then remove the Outer Sleeve and tighten by hand.
- For a pre-determined screw trajectory when inserting Cortex Screws, either the 3.5mm Locking Drill Guide with 2.7mm Insert or 2.7mm Locking Drill Guide with 2.0mm Insert should be used.
- The 3.5mm Locking Drill Guide–One Piece, and 2.0mm Locking Drill Guide–One Piece, may be substituted for the Locking Drill Guides with Inserts.
- Locking screws may be inserted on power, but should always be tightened by hand. Tightening screws on power may cause loss of reduction, exposure of the screw head to excessive torque or damage to the drill.

2.7mm Cortex Screw Technique

- Drill with the Long 2.0mm Drill Bit through the Drill Guide with 2.0mm Neutral Locking Hole Insert. Screw length may be determined by reading the calibrations on the Drill Bit or by using the 2.7mm Depth Gauge. If using the 2.7mm Depth Gauge, remove the Drill Guide for accurate measurement. Insert the appropriate length 2.7mm Cortex Screw using the 2.5mm Hexdriver.



2.0mm Neutral Locking Hole Insert
Cat. No. 7117-3453

Universal Drill Guide Handle
Cat. No. 7117-3349

2.0mm Drill Bit with Quick Connect
Cat. No. 7117-3501

2.7mm Screw Depth Gauge
Cat. No. 7117-3525

2.5mm Hexdriver Shaft with AO Quick Connect
Cat. No. 7117-3535

2.7mm Locking Screw Technique

- Thread the 2.7mm Locking Screw Guide with 2.0mm Insert into one of the three (3) distal locking holes. Drill with the Long 2.0mm Drill Bit and measure for screw length by reading the calibrations on the Drill Bit or by using the 2.7mm Depth Gauge. If using the Depth Gauge, remove 2.0mm Drill Guide Insert. Insert the appropriate length 2.7mm Locking Screw using the 2.5mm Hexdriver.

2.0mm Drill Bit with Quick Connect
Cat. No. 7117-3501

2.7mm Locking Screw Guide
Cat. No. 7117-3452

2.7mm Screw Depth Gauge
Cat. No. 7117-3525

2.5mm Hexdriver Shaft with AO Quick Connect
Cat. No. 7117-3535

2.0mm Locking Drill Guide Insert
Cat. No. 7117-3449

3.5mm Cortex Screw Technique

- Drill with the Long 2.7mm Drill Bit through the Drill Guide with 2.7mm Neutral Locking Hole Insert. Screw length may be determined by reading the calibrations on the Drill Bit or by using the 3.5mm Depth Gauge. If using the Depth Gauge, remove the Locking Hole Insert for accurate measurement. Insert the appropriate length screw with the 3.5mm Hexdriver.

2.7mm Neutral Locking Hole Insert
Cat. No. 7117-3514

Universal Drill Guide Handle
Cat. No. 7117-3349

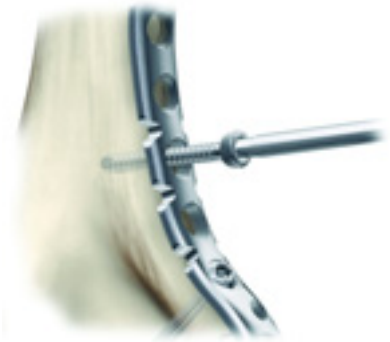
2.7mm Drill Bit with AO Quick Connect
Cat. No. 7117-3503

Short 3.5mm Screw Depth Gauge
Cat. No. 7117-3523

3.5mm Hexdriver Shaft with AO Quick Connect
Cat. No. 7117-3537

3.5mm Locking Screw Technique

- Thread the 3.5mm Locking Screw Guide with Insert into the locking hole. Drill with the Long 2.7mm Drill Bit and measure for screw length by reading the calibrations on the Drill Bit or by using the 3.5mm Depth Gauge. If using Depth Gauge, the Locking Drill Guide Insert must be removed for accurate measurement. Insert the appropriate length screw using the 3.5mm Hexdriver.



2.7mm Drill Bit with AO Quick Connect
Cat. No. 7117-3503

Short 3.5mm Screw Depth Gauge
Cat. No. 7117-3523

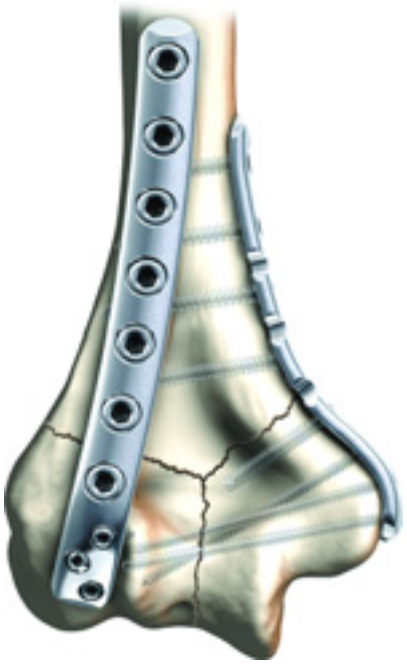
3.5mm Locking Screw Guide
Cat. No. 7117-3538

2.7mm Locking Drill Guide Insert
Cat. No. 7117-3529

3.5mm Hexdriver Shaft with AO Quick Connect
Cat. No. 7117-3537

Incision Closure

Verify fracture reduction under fluoroscopy and use the appropriate method for surgical closure of the incision.



Catalogue Information – Elbow/2.7mm Plates

Medial Distal Humerus Plates

Cat. No.	Length	Minimum Suggested Qty
7180-1805	5H Right 79mm	1
7180-1807	7H Right 103mm	1
7180-1809	9H Right 127mm	0
7180-1811	11H Right 151mm	0
7180-1813	13H Right 174mm	0
7180-1905	5H Left 79mm	1
7180-1907	7H Left 103mm	1
7180-1909	9H Left 127mm	0
7180-1911	11H Left 151mm	0
7180-1913	13H Left 174mm	0

Lateral Distal Humerus Plates

Cat. No.	Length	Minimum Suggested Qty
7180-2405	5H Left 77mm	1
7180-2407	7H Left 102mm	1
7180-2409	9H Left 128mm	0
7180-2411	11H Left 153mm	1
7180-2505	5H Right 77mm	0
7180-2507	7H Right 102mm	1
7180-2509	9H Right 128mm	0
7180-2511	11H Right 153mm	1

Posterolateral Distal Humerus Plates

Cat. No.	Length	Minimum Suggested Qty
7180-2605	5H Left 80mm	0
7180-2607	7H Left 107mm	1
7180-2609	9H Left 132mm	0
7180-2611	11H Left 157mm	1
7180-2615	15H Left 207mm	0
7180-2705	5H Right 80mm	0
7180-2707	7H Right 107mm	1
7180-2709	9H Right 132mm	0
7180-2711	11H Right 157mm	1
7180-2715	15H Right 207mm	0

Catalogue Information – Small Fragment System Screws

Small Fragment System
2.7mm Self-Tapping Cortex Screws
(Non-Locking)

Cat. No.	Length	Minimum Suggested Qty
7180-3010	10mm	3
7180-3012	12mm	3
7180-3014	14mm	3
7180-3016	16mm	3
7180-3018	18mm	3
7180-3020	20mm	3
7180-3022	22mm	3
7180-3024	24mm	3
7180-3026	26mm	3
7180-3028	28mm	3
7180-3030	30mm	3
7180-3032	32mm	3
7180-3034	34mm	3
7180-3036	36mm	3
7180-3038	38mm	3
7180-3040	40mm	3
7180-3045	45mm	3
7180-3050	50mm	3
7180-3055	55mm	3
7180-3060	60mm	3
7180-3065	65mm	3
7180-3070	70mm	3

Small Fragment System
3.5mm Self-Tapping Cortex Screws
(Non-Locking)

Cat. No.	Length	Minimum Suggested Qty
7180-4010	10mm	5
7180-4012	12mm	5
7180-4014	14mm	5
7180-4016	16mm	10
7180-4018	18mm	10
7180-4020	20mm	5
7180-4022	22mm	5
7180-4024	24mm	5
7180-4026	26mm	5
7180-4028	28mm	5
7180-4030	30mm	5
7180-4032	32mm	5
7180-4034	34mm	5
7180-4036	36mm	5
7180-4038	38mm	5
7180-4040	40mm	5
7180-4045	45mm	5
7180-4050	50mm	5
7180-4055	55mm	5
7180-4060	60mm	5
7180-4065	65mm	5
7180-4070	70mm	5
7180-4075	75mm	5
7180-4080	80mm	5
7180-4085	85mm	0
7180-4090	90mm	0
7180-4095	95mm	0
7180-4100	100mm	0
7180-4105	105mm	0
7180-4110	110mm	0

Small Fragment System 2.7mm Locking Self-Tapping Cortex Screws

Cat. No.	Length	Minimum Suggested Qty
7180-2310	10mm	4
7180-2312	12mm	4
7180-2314	14mm	4
7180-2316	16mm	4
7180-2318	18mm	4
7180-2320	20mm	4
7180-2322	22mm	4
7180-2324	24mm	4
7180-2326	26mm	4
7180-2328	28mm	4
7180-2330	30mm	4
7180-2332	32mm	2
7180-2334	34mm	2
7180-2336	36mm	2
7180-2338	38mm	2
7180-2340	40mm	4
7180-2345	45mm	4
7180-2350	50mm	8
7180-2355	55mm	2
7180-2360	60mm	2

Small Fragment System 3.5mm Locking Self-Tapping Cortex Screws

Cat. No.	Length	Minimum Suggested Qty
7180-5010	10mm	5
7180-5012	12mm	5
7180-5014	14mm	5
7180-5016	16mm	10
7180-5018	18mm	10
7180-5020	20mm	5
7180-5022	22mm	5
7180-5024	24mm	5
7180-5026	26mm	5
7180-5028	28mm	5
7180-5030	30mm	5
7180-5032	32mm	5
7180-5034	34mm	5
7180-5036	36mm	5
7180-5038	38mm	5
7180-5040	40mm	5
7180-5045	45mm	5
7180-5050	50mm	5
7180-5055	55mm	5
7180-5060	60mm	5
7180-5065	65mm	5
7180-5070	70mm	5
7180-5075	75mm	5
7180-5080	80mm	5
7180-5085	85mm	0
7180-5090	90mm	0
7180-5095	95mm	0
7180-5100	100mm	0
7180-5105	105mm	0
7180-5110	110mm	0

Catalogue Information – Small Fragment System Instruments

Sharp Hook
Cat. No. 7117-0043

Hohmann Retractor, 8mm Width
Cat. No. 7117-0057

Hohmann Retractor, 15mm Width
Cat. No. 7117-0095

Hohmann Retractor Bent, 8mm
Cat. No. 7117-3369

Wire Bending Pliers, 140mm Length
Cat. No. 7117-0063

Bending Pliers for 2.7mm
& 3.5mm Plates
Cat. No. 7117-0076

Bending Pliers for 3.5mm
Reconstruction Plates
Cat. No. 7117-0175

Periosteal Elevator 6mm, Rounded
Cat. No. 7117-0097

Universal Plate Bending Irons
Cat. No. 7117-3367

Small Fragment Countersink
Cat. No. 7117-3344

Reduction Forceps w/ Ratchet-Bowed, 205mm
Cat. No. 7117-3370

Reduction Forceps w/Points, Broad
Cat. No. 7117-3377

Reduction Forceps w/Serrated Jaw
Cat. No. 7117-3378

3.5mm Locking Screw Guide
Cat. No. 7117-3538

2.7mm Locking Drill Guide Insert
Cat. No. 7117-3529

2.7mm Locking Drill Guide – One Piece
(Optional)
Cat. No. 7117-3450

Universal Drill Guide Handle
Cat. No. 7117-3349

2.0mm Wire/Drill Insert
Cat. No. 7117-3517

2.7mm Drill Guide Insert
Cat. No. 7117-3510

3.5mm Drill Guide Insert
Cat. No. 7117-3513

2.7mm Neutral Locking Hole Insert
Cat. No. 7117-3514

2.7mm Compression Locking Hole Insert
Cat. No. 7117-3515

2.7mm Neutral Slot Insert
Cat. No. 7117-3512

2.7mm Compression Slot Insert
Cat. No. 7117-3511

2.0mm Parallel Wire/Drill Guide
Cat. No. 7117-3516

Short 3.5mm Screw Depth Gauge
Cat. No. 7117-3523

2.7mm Screw Depth Gauge
Cat. No. 7117-3525

3.5mm Screw Depth Gauge
Cat. No. 7117-3534

Cannulated Bending Irons for K-wires
Cat. No. 7117-3527

Cannulated AO to Trinkle Adaptor
Cat. No. 7117-3528

Small T-Handle, Quick Coupling
Cat. No. 7117-3542

Tear Drop Handle Screwdriver w/Quick Connect
Cat. No. 7117-3543

Large Screwdriver Handle
Cat. No. 7117-3547

Self Centering Reverse Verbrugge, 190mm
Cat. No. 7117-3544

2.5mm Hexdriver Shaft w/AO Quick Connect
Cat. No. 7117-3535

3.5mm Hexdriver Shaft w/AO Quick Connect
Cat. No. 7117-3537

Small Fragment Guide Removal Assembly
Cat. No. 7117-3549

2.0mm Locking Drill Guide
Cat. No. 7117-3448

2.0mm Locking Drill Guide Insert
Cat. No. 7117-3449

2.7mm Locking Screw Guide
Cat. No. 7117-3452

2.0mm Neutral Locking Hole Insert
Cat. No. 7117-3453

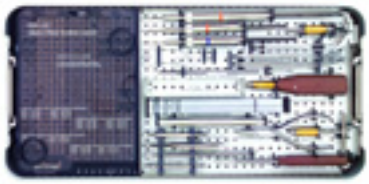
2.7mm Screw Guide Remover
Cat. No. 7117-3455

Catalogue Information – Small Fragment System Trays

Large Outer Case – 4.8”
Cat. No. 7112-9400

Lid for Outer Cases
Cat. No. 7112-9402

PERI-LOC◇ Small Fragment Instrument Tray
Cat. No. 7652-2300



Catalogue Information – Small Fragment System Disposables

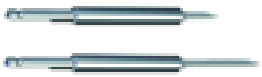
K-Wires with Trocar Point and Threaded Pins

Cat. No.	Description	Maximum Tray Qty
7116-1012	1.25mm x 150mm	6
7116-1016	1.6mm x 150mm	6
7116-1020	2.0mm x 150mm	6

Taps with Quick Connect

Cat. No.	Description	Maximum Tray Qty
7117-3318	3.5mm	2
7117-3366	2.7mm	2
7117-3386	4.0mm Cancellous	2

Provisional Fixation Pins



Cat. No.	Description	Maximum Tray Qty
7117-3322	2.7mm x 18mm	4
7117-3323	2.7mm x 40mm	4

Drill Bits with Quick Connect

Cat. No.	Description	Maximum Tray Qty
7117-3501	2.0mm	2
7117-3502	2.7mm Short	2
7117-3503	2.7mm	2
7117-3504	3.5mm Short	2

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