

ACUMED®



Polarus® Proximal
Humeral Plating
System

Polarus® PHP System

Acumed® is a global leader of innovative orthopaedic and medical solutions.

We are dedicated to developing products, service methods and approaches that improve patient care.



The Polarus® PHP aims to aid in resolving the challenges inherent in fractures of the proximal humerus. Due to their unique anatomy, these fractures are a difficult indication to address. Whether or not a proximal humerus fracture features robust, good quality bone or osteoporotic bone, each fracture pattern is typically difficult to reduce without a high rate of failure.

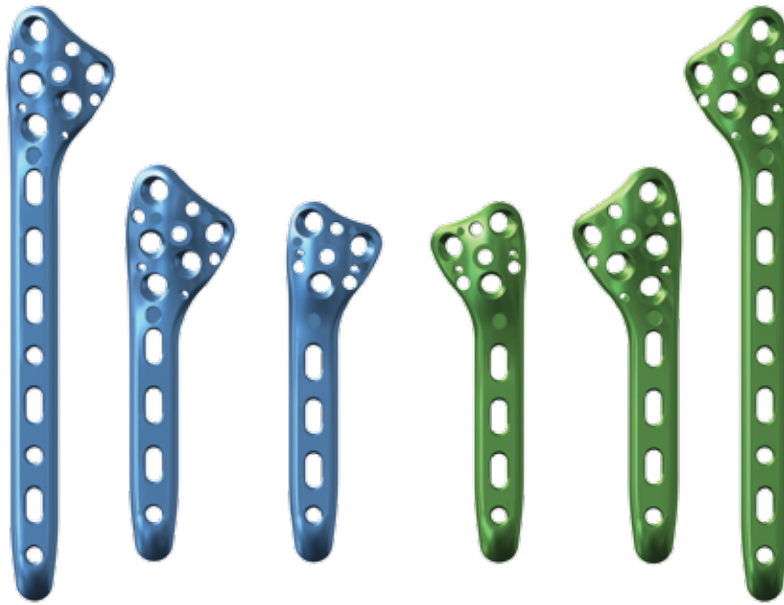
The Polarus® PHP is one of the cornerstones of the Polarus® family of innovative shoulder products. When combined with the Polarus® Humeral Rod and the Polarus® Modular Shoulder system, Acumed® offers a comprehensive selection of implants specifically designed to address a variety of difficult fracture patterns in this challenging indication.

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Plate Family

- Extra-long Plate: 154 mm
- 5-hole Large Plate: 102 mm
- 3-hole Small Plate: 93 mm



Screw Family

- 5.0 mm nonlocking cancellous screw (for reduction of the humeral head)
- 3.5 mm nonlocking screw (for fixation in the humeral shaft)
- 3.5 mm locking screw (for fixation in the humeral shaft)
- 5.7 mm locking screw (for fixation in the humeral head)

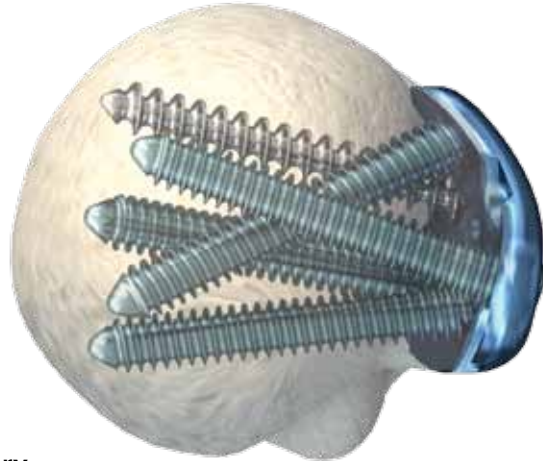


Plate and Screw Features



Instrumentation

Advanced instrumentation designed to reduce steps in operation



Trajectory

Precise screw trajectories designed to purchase best bone quality in the humeral head

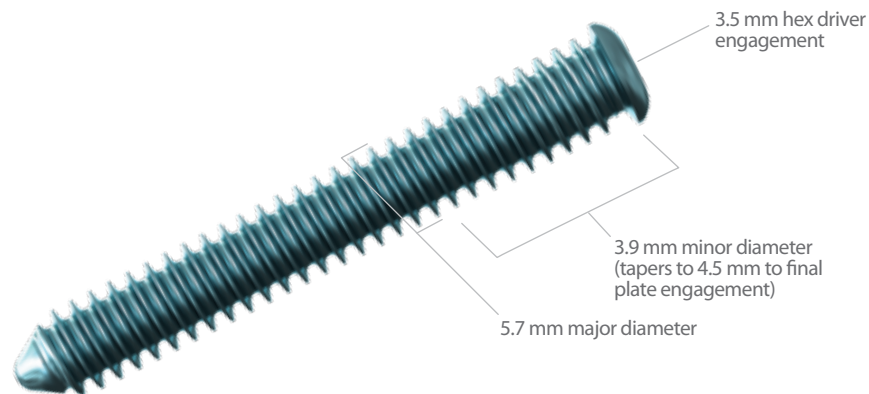


Anatomic Fit

Anatomic fit designed to act as a template and reduce soft tissue irritation

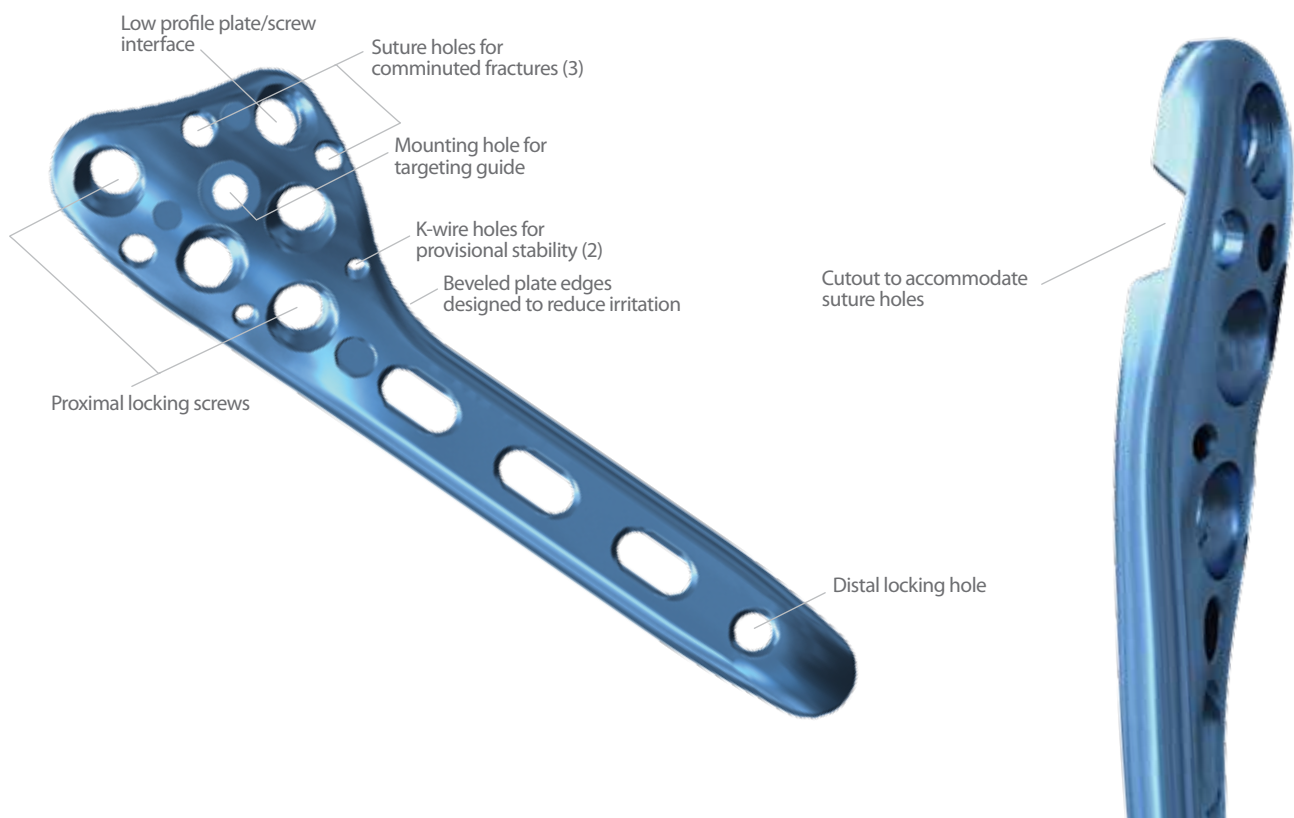
5.7 mm Locking Screw

- 3.5 mm Hex driver engagement
- Tapered inside diameter for even plate engagement
- 5.7 mm major diameter
- Titanium (Ti-6Al-4V ELI)
- 3.9 mm minor diameter (tapers to 4.5 mm to final plate engagement)
- Available in lengths of 26 mm to 54 mm in 2 mm increments

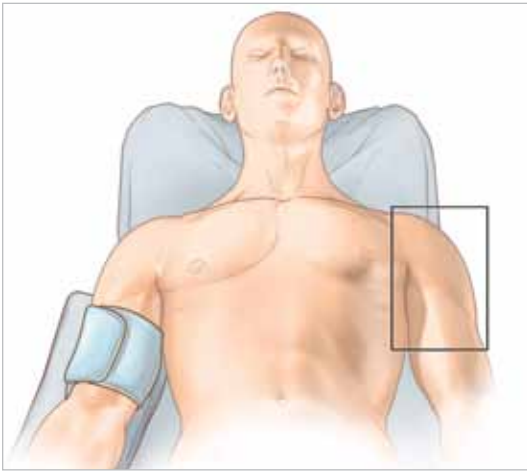


Plate

- Proximal locking screws
- Low profile plate/screw interface
- Mounting hole for targeting guide
- K-wire holes for provisional stability
- Suture holes for comminuted fractures
- Reduction slots
- Beveled plate edges designed to reduce irritation
- Distal locking hole
- Color coded for left (blue) and right (green) applications
- Titanium Grade 2

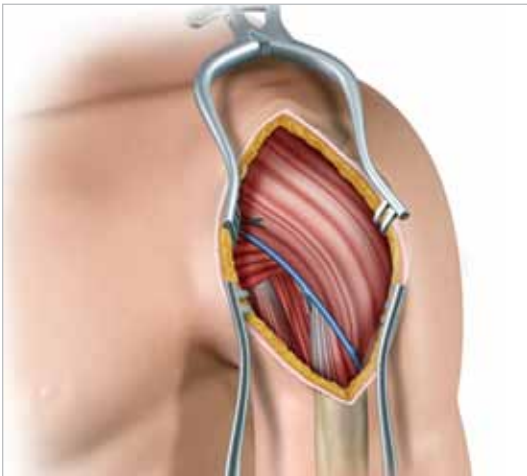


Polarus® Proximal Humeral Plate Surgical Technique



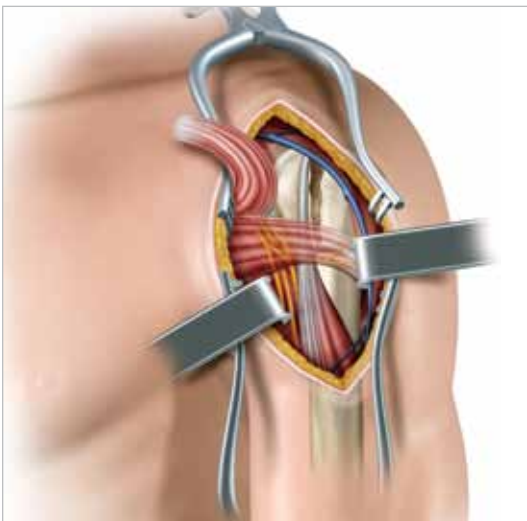
1 PATIENT POSITIONING

The patient is placed in a beach chair position and the arm is draped to aid with fracture reduction. Create an entry site for access to the proximal humerus through a 10 mm standard deltoid-pectoral incision made obliquely, in line with the deltoid-pectoral interval. As an alternative, the incision may be made in a more longitudinal direction, starting at the level of the acromioclavicular joint and extending distally. This approach may potentially be more cosmetic for the patient. **Fluoroscopy should be used in all cases.**



2 INCISION

Sharply dissect down to the level of the fascia and elevate the skin flaps. Identify the cephalic vein and develop the interval between the deltoid and the pectoralis. Retract the cephalic vein laterally and the pectoralis major medially.



3 APPROACH

Release the fascia along the lateral border of the coracobrachialis and retract it medially to expose the proximal humerus with the subscapularis tendon attachment. To help facilitate reduction and improve fracture visualization, release the superior one-third of the pectoralis major from the shaft. It is important to place a finger underneath the pectoralis major as it is being released to protect the biceps tendon, which lies directly underneath.

4 PLATE SELECTION

The Polarus® Proximal Humerus Plates are anatomically designed to fit an array of patient anatomies and are left and right specific. In most cases, the Large Proximal Humeral Plate (PL-PHGL or PL-PHGR) should be chosen. If the patient is small-boned, the Small Proximal Humeral Plate (PL-PHSL or PL-PHSR) may be a better fit. If the fracture pattern includes a fracture line distal to the surgical neck, an Extra-Long Proximal Humeral Plate (PL-PHXGL or PL-PHGR) may be utilized.



5 PLATE PLACEMENT

Place the Polarus® PHP 3 to 5 mm posterior to the bicipital groove and approximately 5 mm inferior to the top of the greater tuberosity. Confirm fracture reduction and plate height fluoroscopically. When proper reduction and positioning are obtained, provisionally secure the plate to the bone with K-wires (WS-1106ST or WS-1505ST) or Plate Tacks (PL-PTACK).

Note: Sutures are commonly used and may be utilized at this time to improve construct stability. The plate construct features suture holes to better address greater tuberosity fragments in three and four-part fractures. These aid in achieving construct stability of these types of fractures. Due to the design of the three suture holes, the sutures may also be added upon completion of plate application.



Polarus® Proximal Humeral Plate Surgical Technique



6 NONLOCKING SCREW INSERTION - SHAFT

Insert a 3.5 mm Bicortical Screw to secure the plate to the shaft. The screw may be inserted through any slot in the plate distal to the fracture. Use the 2.8 mm Drill Guide (PL-2095) and the short 2.8 mm Drill (MS-DC28); using the Standard Depth Gauge (MS-9020) determine the appropriate length of screw to be used. Using the 2.5 mm Hex Driver (HPC-0025), insert a 3.5 mm Nonlocking Cortical Screw (CO-3XXX) of the appropriate length. The provisional fixation hardware may now be removed.



7 NONLOCKING SCREW INSERTION - HUMERAL HEAD

For reference to hole numbers, please use the following diagram to the left. Select the appropriate Targeting Guide (for large and extra-long plates: [MS-PHGL or MS-PHGR], for small plates: [MS-PHSL or MS-PHSR]) and secure it to the plate with the Targeting Guide Locking Screw (MS-TGLS), utilizing the 3.5 mm Hex Driver (MS-PH35). The first proximal head screw placed should be the #1 - posterior pointing hole (see image to the left) on the large or extra-long plate and the #1 - most distal hole on the small plate.



Utilizing the 2.8 mm Drill Guide (MS-DG28) and the long 2.8 mm Drill (MS-PH28), drill your hole and utilize the laser mark on the drill with the scale on the back of the drill guide to determine the appropriate screw length. For accurate measurement, be sure that the drill guide is fully seated into the targeting guide.



Remove the drill and drill guide and insert a 5.0 mm Nonlocking Cancellous Screw (HCA-51XX) through the targeting guide and plate. Utilizing the 5.0 mm Nonlocking Screw helps draw the plate to the bone, affirm reduction, and ensure a low-profile plate-to-bone interface.



8 LOCKING SCREW PREPARATION – HUMERAL HEAD

Note: For humeral head screw insertion, screws should be inserted in a clockwise order.

Insert the fuchsia-banded 4.6 mm Drill Guide (MS-DG46) into the #2 – most distal hole on the large and extra-long plate and #2 most proximal hole on the small plate. (Note that any proximal hole has the ability to accept either the blue 5.7 mm Locking Screws or the fuchsia 4.5 mm Locking Buttress Screws.) Drill utilizing the 4.6 mm fuchsia-banded Drill (MS-PH46) either under power or by hand. Determine the screw length by aligning the laser mark on the drill with the scale on the back of the drill guide. For accurate measurement, be sure the drill is fully seated into the targeting guide. Use of fluoroscopy will help confirm accurate screw placement in the humeral head.



9 LOCKING SCREW INSERTION – HUMERAL HEAD

Note: Prior to inserting your choice of locking screws, be sure to confirm that the fracture is reduced anatomically.

Remove the drill and drill guide and insert a blue 5.7 mm Locking Screw (30-04XX). Either screw choice should be of the longest length possible across the humeral head, reaching the subchondral bone but without breaking through the articular surface of the head. Both options of locking screws can be inserted using the 3.5 mm Hex Driver (HPC-0035) with standard handle (MS-3200) but utilizing the 3.5 mm hex driver coupled with the Ratcheting Handle (80-0663) may be especially helpful when utilizing the blue 5.7 mm Locking Screws. (This is due to the screws engaging the plate over the full length of the screw.)



Polarus® Proximal Humeral Plate Surgical Technique



10 FILLING THE REMAINING HUMERAL HEAD SCREWS

Using the same process described in steps 8 and 9, fill the remaining humeral head plate holes in the recommended clockwise order. The originally placed 5.0 mm Nonlocking Screw may be replaced with a locking screw at the end.

Note: If any screws have trouble locking into the plate, remove them and use the fuchsia-banded Clearance Drill (MS-PHBCD) to further prepare the entry site. Re-drilling (without moving the plate) with the 4.6 mm Drill and double-checking the depth measurement may also help.



11 SCREW INSERTION IN THE SHAFT

Insert 3.5 mm Bicortical Screws (CO-3XXX) in the remaining holes utilizing the technique described in step 6.

Note: Blue 3.5 mm Locking Screws (COL-3XXX) should be placed in the round hole of the shaft (or holes, if using the extra-long plate). The Locking Drill Guide (MS-LDG35) must be used prior to drilling. In these cases, screw length is measured with the Standard Depth Gauge (MS-9020).



12 SOFT-TISSUE CLOSURE

Close the wound in layers with a subarticular stitch and place a drain for early post-operative recovery.

13 POSTOP PROTOCOL

Passive range of motion exercises are initiated for the first four weeks, then active assisted for two weeks. Active range of motion and strengthening are started at approximately six weeks post-operatively when fracture healing is evident on radiographs.

Proximal Humeral Plates

Proximal Humeral Plate, Large, Left	PL-PHGL
Proximal Humeral Plate, Large, Right	PL-PHGR
Proximal Humeral Plate, Small, Left	PL-PHSL
Proximal Humeral Plate, Small, Right	PL-PHSR
Proximal Humeral Plate, Extra Long, L	PL-PHXGL
Proximal Humeral Plate, Extra Long, R	PL-PHXGR

Drivers, Drills, and Sleeves:

2.5 mm Quick Release Hex Driver	HPC-0025
3.5 mm Quick Release Hex Driver	HPC-0035
Medium Ratcheting Driver Handle	80-0663
3.5 mm Quick Release Hex Driver	HPC-0035
2.8 mm X 5" Quick Release Drill	MS-DC28
3.5 mm X 5" Quick Release Drill	MS-DC35
2.8 mm Cancellous Drill	MS-PH28
4.6 mm Cancellous Drill	MS-PH46
PHB Screw Clearance Drill	MS-PHBCD
2.8 mm Drill Guide Assembly	MS-DG28
4.6 mm Drill Guide Assembly	MS-DG46
3.5 mm Locking Drill Guide	MS-LDG35
3.5 mm Cortical Screw Bone Tap	MS-LTT35
3.5 mm Screw Driver Sleeve	MS-SS35
4.5 mm Screw Sleeve	MS-SS46
7.0 mm Screw Driver Sleeve	MS-SS57
3.5 mm Tap Sleeve Assembly	PL-2190

Instrumentation Trays

Polarus® PHP Tray Assembly	PL-PH01
Polarus® PHP Screw Caddy	80-0818
Polarus® PHP Screw Caddy Lid	80-0819

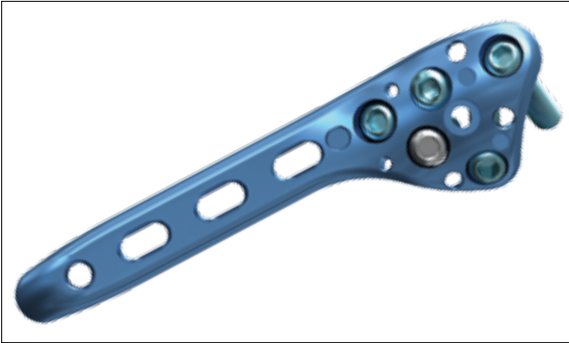
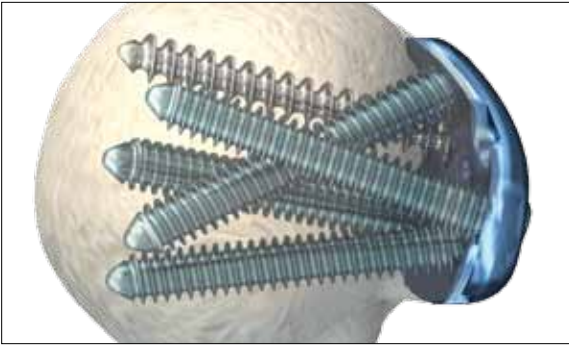
Accompanying Instrumentation

8" Bone Reduction Forceps	MS-1280
Large Screw Holding Forceps	MS-45210
Periosteal Elevator	MS-46213
9" Bone Reduction Spanish Forceps	MS-47107
6 mm-70 mm Depth Gauge	MS-9020
Polarus® PHP Targeting Guide, Large, Left	MS-PHGL
Polarus® PHP Targeting Guide, Large, Right	MS-PHGR
Polarus® PHP Targeting Guide, Small, Left	MS-PHSL
Polarus® PHP Targeting Guide, Small, Right	MS-PHSR
Polarus® PHP Targeting Guide Lock Screw	MS-TGLS
Offset Drill Guide	PL-2095
Verbrugge Clamp	PL-CLVB
Plate Tack	PL-PTACK
Polarus® PHP X-Ray Template	POL70-01
.062" X 9" ST Guide Wire	WS-1609ST
2.0 mm X 9" ST Guide Wire	WS-2009ST

5.7 mm Locking Cancellous Screws

5.7 mm x 26 mm Locking Screw	30-0426
5.7 mm x 28 mm Locking Screw	30-0428
5.7 mm x 30 mm Locking Screw	30-0430
5.7 mm x 32 mm Locking Screw	30-0432
5.7 mm x 34 mm Locking Screw	30-0434
5.7 mm x 36 mm Locking Screw	30-0436
5.7 mm x 38 mm Locking Screw	30-0438
5.7 mm x 40 mm Locking Screw	30-0440
5.7 mm x 42 mm Locking Screw	30-0442
5.7 mm x 44 mm Locking Screw	30-0444
5.7 mm x 46 mm Locking Screw	30-0446
5.7 mm x 48 mm Locking Screw	30-0448
5.7 mm x 50 mm Locking Screw	30-0450
5.7 mm x 52 mm Locking Screw	30-0452
5.7 mm x 54 mm Locking Screw	30-0454

Ordering Information



5.0 mm Nonlocking Cancellous Screws

5.0 mm x 25.0 mm Cancellous Screw	HCA-5125
5.0 mm x 27.5 mm Cancellous Screw	HCA-5127
5.0 mm x 30.0 mm Cancellous Screw	HCA-5130
5.0 mm x 32.5 mm Cancellous Screw	HCA-5132
5.0 mm x 35.0 mm Cancellous Screw	HCA-5135
5.0 mm x 37.5 mm Cancellous Screw	HCA-5137
5.0 mm x 40.0 mm Cancellous Screw	HCA-5140
5.0 mm x 45.0 mm Cancellous Screw	HCA-5145
5.0 mm x 50.0 mm Cancellous Screw	HCA-5150
5.0 mm x 55.0 mm Cancellous Screw	HCA-5155

3.5 mm Nonlocking Cortical Screws

3.5 mm x 20.0 mm Cortical Screw	CO-3200
3.5 mm x 22.5 mm Cortical Screw	CO-3225
3.5 mm x 25.0 mm Cortical Screw	CO-3250
3.5 mm x 27.5 mm Cortical Screw	CO-3275
3.5 mm x 30.0 mm Cortical Screw	CO-3300
3.5 mm x 32.5 mm Cortical Screw	CO-3325
3.5 mm x 35.0 mm Cortical Screw	CO-3350
3.5 mm x 40.0 mm Cortical Screw	CO-3400
3.5 mm x 45.0 mm Cortical Screw	CO-3450
3.5 mm x 50.0 mm Cortical Screw	CO-3500
3.5 mm x 55.0 mm Cortical Screw	CO-3550

3.5 mm Locking Cortical Screws

3.5 mm x 20.0 mm Locking Cortical Screw	COL-3200
3.5 mm x 22.5 mm Locking Cortical Screw	COL-3225
3.5 mm x 25.0 mm Locking Cortical Screw	COL-3250
3.5 mm x 27.5 mm Locking Cortical Screw	COL-3275
3.5 mm x 30.0 mm Locking Cortical Screw	COL-3300

To learn more about the full line of Acumed® innovative surgical solutions, please contact your local Acumed® Sales Representative or call 888-627-9957.

Acumed®

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SHD00-05-B

Effective: 5/2012

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