OrthoLine™ Distal Humeral Fracture System

Surgical Technique

Arthrex® Vet Systems

OrthoLine™ Distal Humeral Fracture System

Introduction

The first anatomic medial distal humeral fracture plate to address medial, supracondylar, T, and Y fractures with a single plate is available in sizes ranging from 2.0 mm to 3.5 mm. OrthoLine plates were thoughtfully engineered by incorporating surgeon feedback and designed for a range of patients.

Features and Benefits

- Plate incorporates the transcondylar screw
- Optimized trajectory for the transcondylar screw
- 4 screws in the distal aspect
- Anatomic plate design with left and right options
- Strong single-bridging plate design
- Epicondylar relief
- Designed for medial, supracondylar, T, and Y fractures[1]

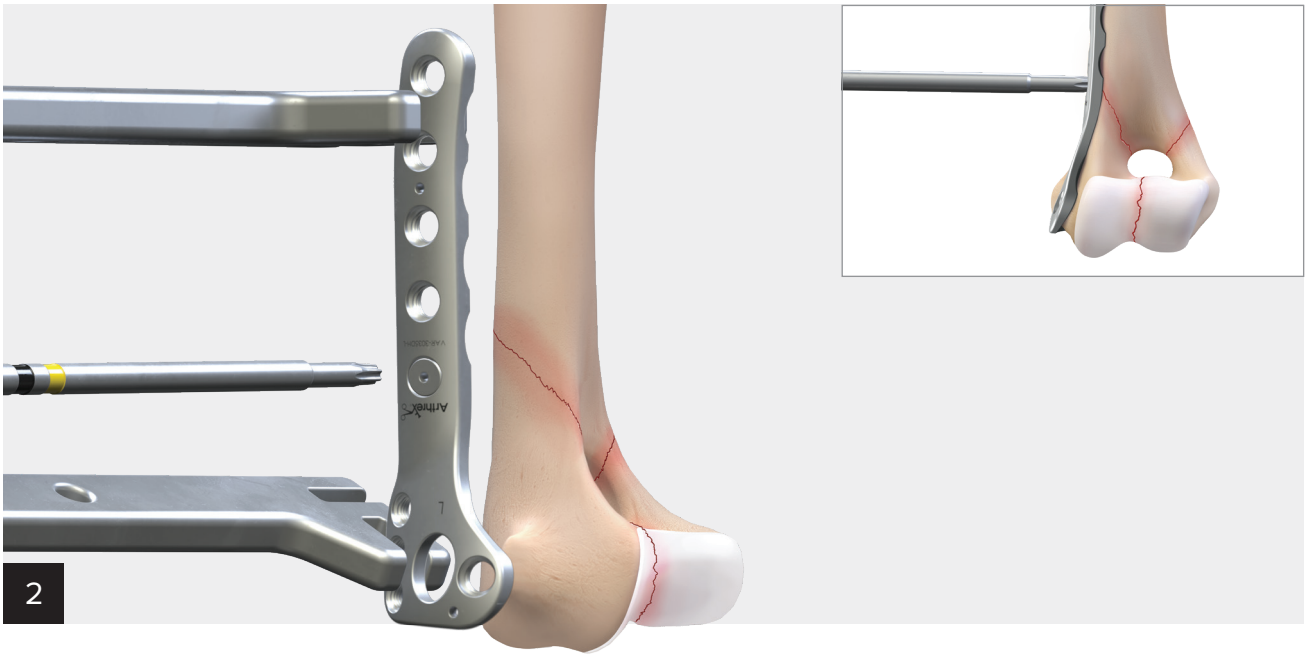
Anatomic Design

Surgical Technique

1

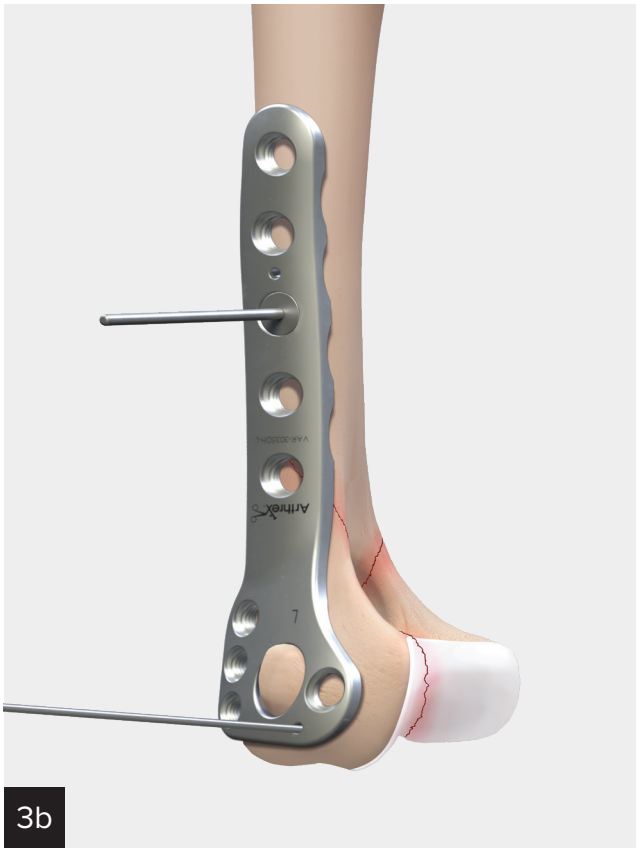
Use a standard bilateral approach to the distal humerus.

Note: The medial approach may incorporate the modified Wendelburg surgical approach and is available in video format on the Arthrex Vet Systems website. Reduce the fracture and hold with a temporary reduction pin placed through the point of the epicondyle.

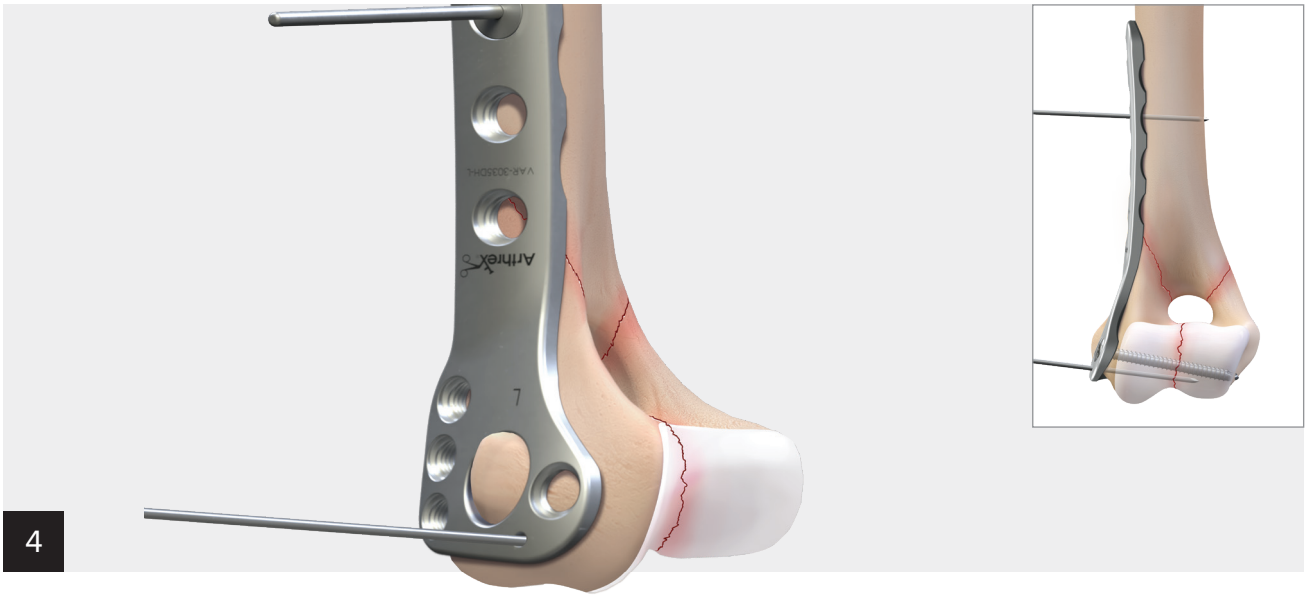


2

Place the plate on the medial surface of the bone with the point of the epicondyle and the temporary reduction pin (if used) placed over and through the large central aperture. It is important that the plate is generally placed as far caudal and proximal as the epicondyle will allow, which should facilitate alignment of the transcondylar screw. Minimal contouring may be required to fit the anatomy, but **this may alter desired screw trajectory** and thus should be kept to a minimum. During contouring, place cannulated bending plug inserts into the locking screw holes where applicable.



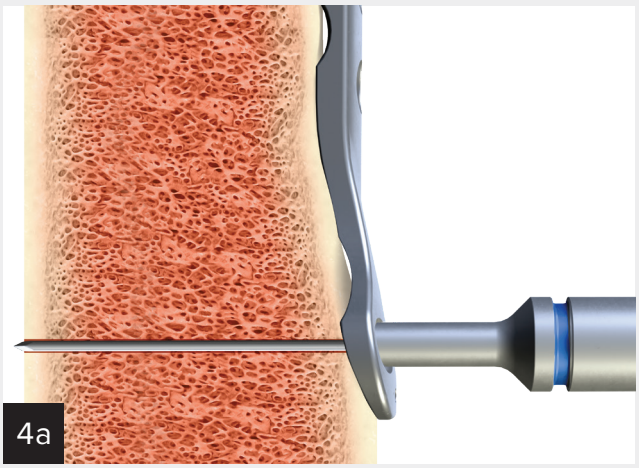
The plate may be temporarily affixed to the bone using a K-wire, cannulated bending plug, or threaded BB-Tak (the BB-Tak should only be used on the proximal aspect). It is important to note the distal K-wire hole has the same trajectory as the transcondylar screw and thus may be used as a reference guide. To achieve appropriate trajectory, hand place the K-wire to rest in the hole prior to driving with the pin driver.



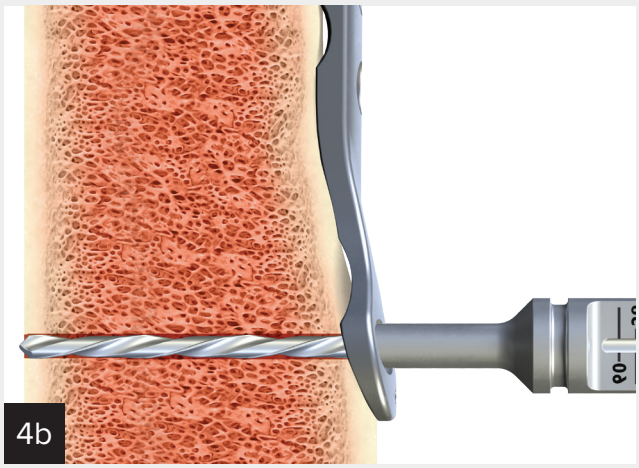
4

Place the K-wire through the locking K-wire guide and confirm the appropriate trajectory by palpating the pin or with a fluoroscopic image. If the trajectory is acceptable, use the appropriate drill bit to create the pilot hole for locking screw insertion. Prior to screw insertion, place a Vusellum or point-to-point forceps to aid in fracture compression.

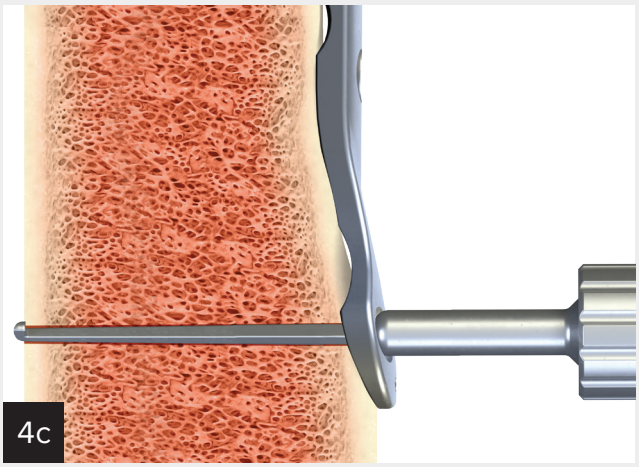
If the K-wire placement is not acceptable, redirect the placement and use the drill bit to drill a pilot hole for a nonlocking cortical screw or, alternatively, on titanium plates (3.0 mm and lower), use a variable angle-locking screw.



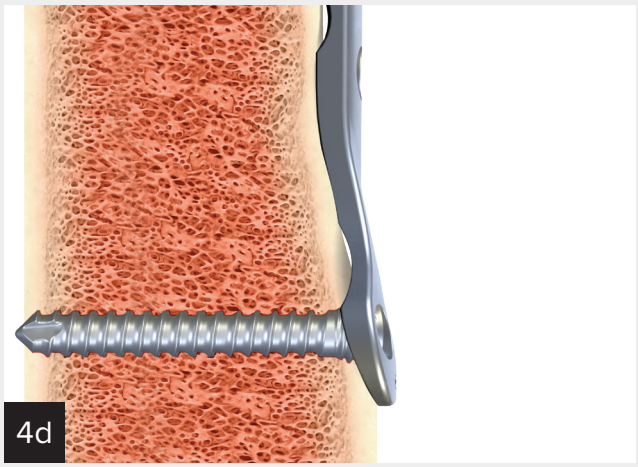
4a



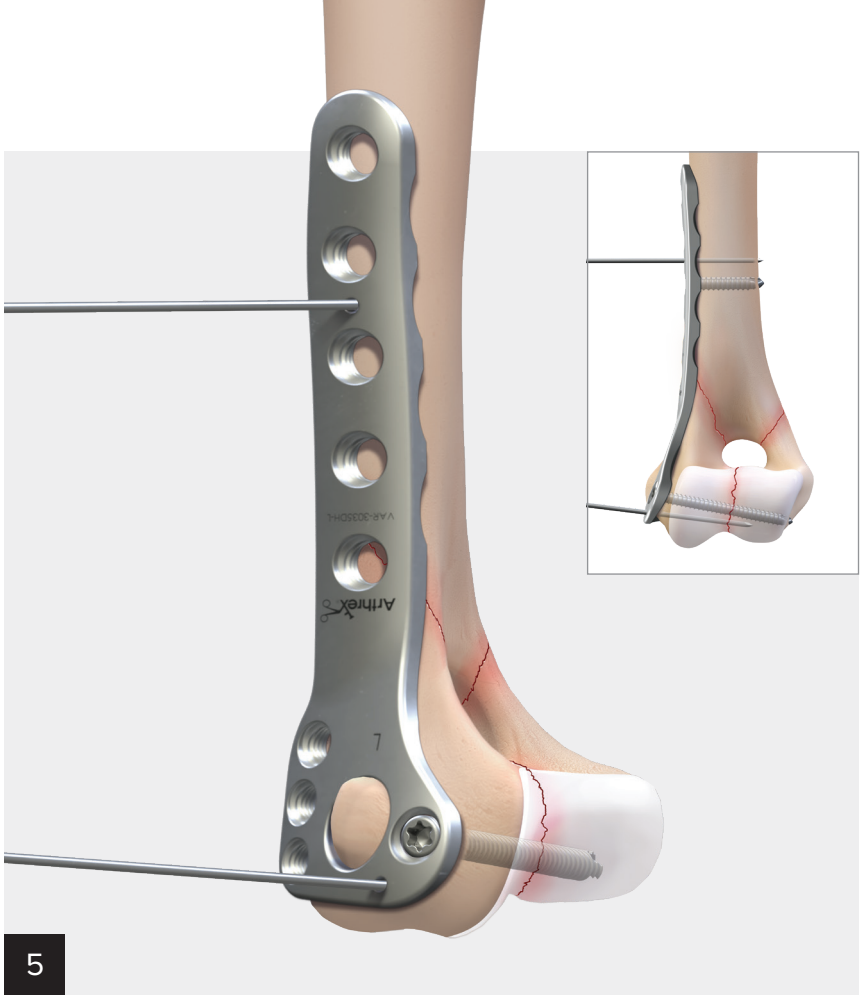
4b



4c



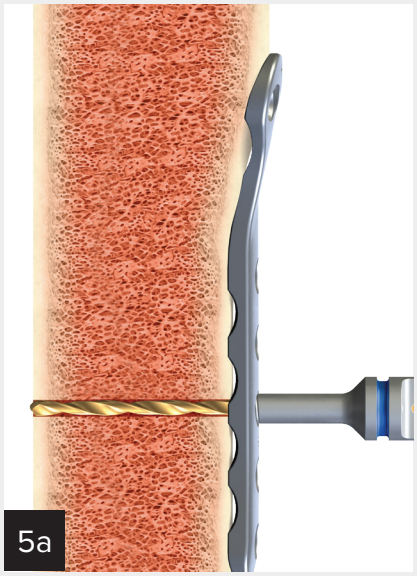
4d

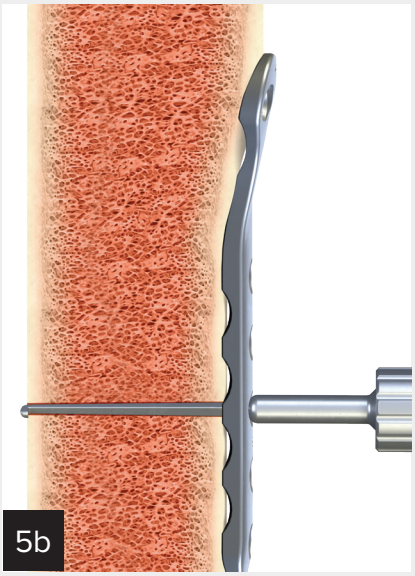


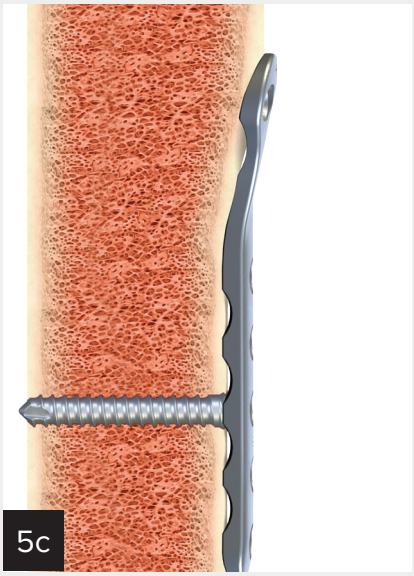
Place the third proximal screw. First, lock in the locking drill guide, drill using the appropriate drill bit, measure, and place the screw. Screws may be placed under power. The final turns, however, should be performed manually with the screwdriver.

Note: The variable-angle guide can also be used for variable-angle locking titanium screws sizes 3.0 mm and below.

Drill Steps: Set 2





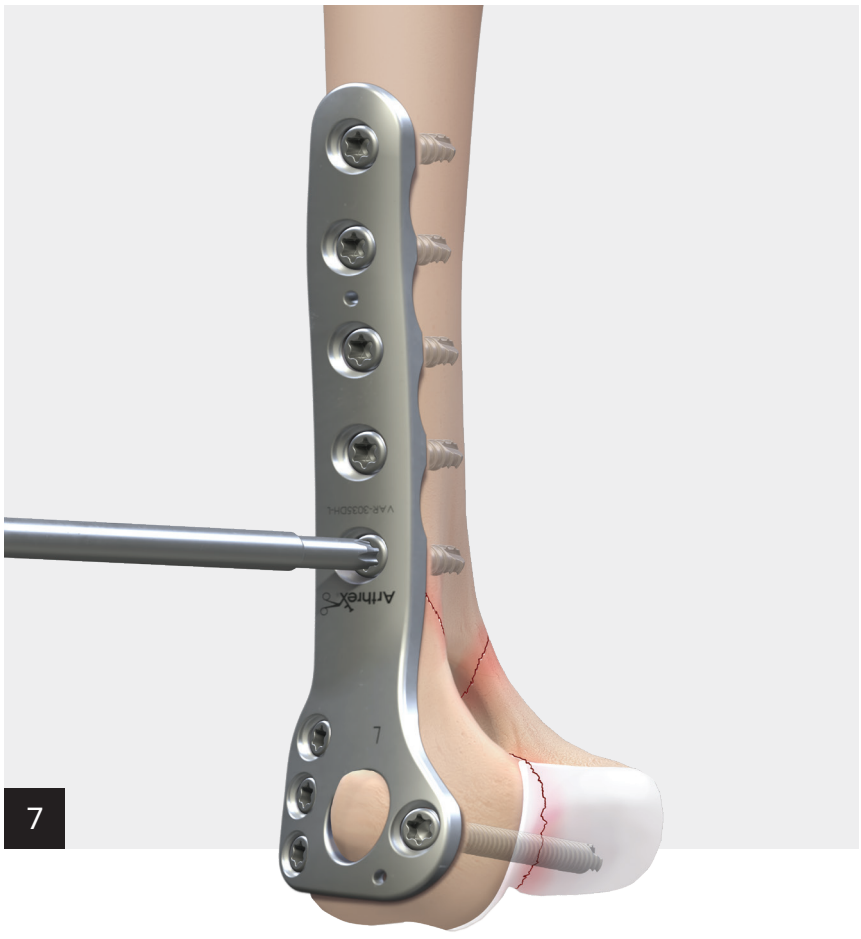


6

Start at the most distal screw on the distal end of the plate and work proximally. For each screw, lock the locking drill guide in the screw hole, drill using the appropriate drill, measure, and place the screw. Screws may be placed under power. The final turns, however, should be performed manually with the manual screwdriver. If the fracture site is below a screw hole, do not place a screw in this location, a bending plug can be used to fill the hole. K-wires can be removed at this point.

Note: The variable-angle guide can also be used for variable-angle locking titanium screws sizes 3.0 mm and below.

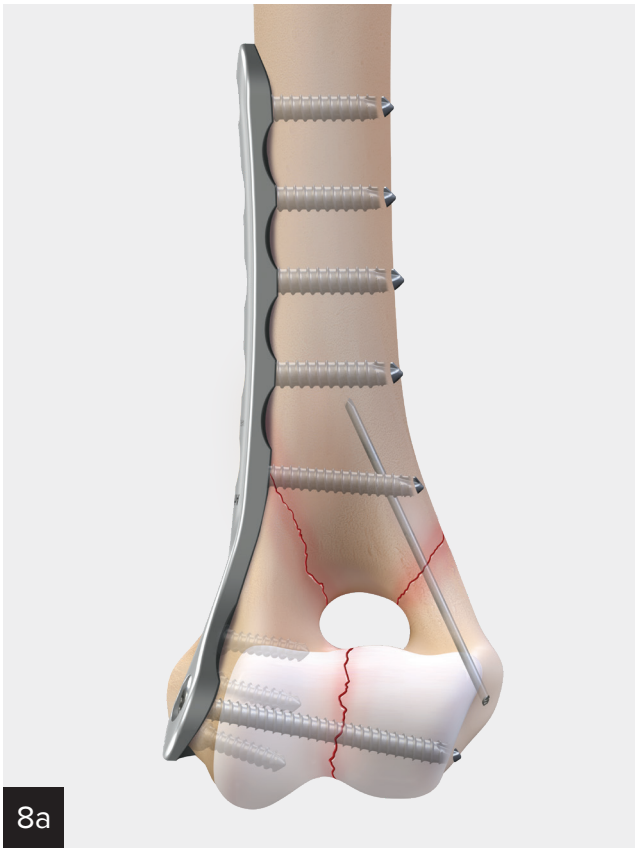
Note: The screws in this step are downsized. For example, the 3.5 mm plate uses 2.7 mm screws, the 3.0 mm plate uses 2.4 mm screws, the 2.4 mm plate uses 2.0 mm screws, and the 2.0 mm plate uses either 2.0 mm or 1.6 mm screws.



7

Apply the proximal screws. Start at the most distal screw on the proximal side of the fracture line and work proximal. First, lock in the locking drill guide, drill using the appropriate drill bit, measure, and place the screw. Screws may be placed under power. The final turns, however, should be performed manually with the manual screwdriver. Remove the BB-Tak and place the next locking screw.

Note: The variable-angle guide can also be used for variable-angle locking titanium screws sizes 3.0 mm and below.



Caudal view

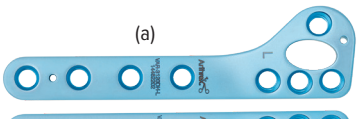
Medial view

Ordering Information

Distal Humeral Plates

Product Description	Item Number
Distal Humeral Plate, Ti, 2.0 mm, left **(a)**	VAR-**3120DH-L**
Distal Humeral Plate, Ti, 2.0 mm, right **(b)**	VAR-**3120DH-R**
Distal Humeral Plate, Ti, 2.4 mm, left **(c)**	VAR-**3124DH-L**
Distal Humeral Plate, Ti, 2.4 mm, right **(d)**	VAR-**3124DH-R**
Distal Humeral Plate, Ti, 3.0 mm, left **(e)**	VAR-**3130DH-L**
Distal Humeral Plate, Ti, 3.0 mm, right **(f)**	VAR-**3130DH-R**
Distal Humeral Plate, SS, 3.5 mm, left **(g)**	VAR-**3035DH-L**
Distal Humeral Plate, SS, 3.5 mm, right **(h)**	VAR-**3035DH-R**

(a)



(b)

(c)

(d)

(e)

(f)

(g)

(h)

Screws

Product Description	Item Number
1.6 mm Low-Profile Cortical, Variable Angle	
Low-Profile Cortical Screw, 1.6 mm × 6 mm-20 mm Sizes: 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 18, 20 mm	VAR-**8916-06** to -**20**
Low-Profile Variable-Angle Screw, 1.6 mm × 6 mm-20 mm Sizes: 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 18, 20 mm	VAR-**8916V-06** to -**20**
2.0 mm Low-Profile Cortical, Variable Angle, Locking	
Low-Profile Cortical Screw, 2.0 mm × 6 mm-30 mm Sizes: 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 18, 20, 22, 24, 26, 28, 30 mm	VAR-**8920-06** to -**30**
Low-Profile Variable-Angle Screw, 2.0 mm × 6 mm-30 mm Sizes: 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 18, 20, 22, 24, 26, 28, 30 mm	VAR-**8920V-06** to -**30**
Low-Profile Locking Screw, 2.0 mm × 6 mm-30 mm Sizes: 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 18, 20, 22, 24, 26, 28, 30 mm	VAR-**8920L-06** to -**30**
2.4 mm Low-Profile Cortical, Variable Angle, Locking	
Low-Profile Cortical Screw, 2.4 mm × 8 mm-30 mm Sizes: 8, 9, 10, 11, 12, 13, 14, 16, 18, 20, 22, 24, 26, 28, 30 mm	VAR-**8924-08** to -**30**
Low-Profile Variable-Angle Screw, 2.4 mm × 8 mma-30 mm Sizes: 8, 9, 10, 11, 12, 13, 14, 16, 18, 20, 22, 24, 26, 28, 30 mm	VAR-**8924V-08** to -**30**
Low-Profile Locking Screw, 2.4 mm × 8 mm-30 mm Sizes: 8, 9, 10, 11, 12, 13, 14, 16, 18, 20, 22, 24, 26, 28, 30 mm	VAR-**8924L-08** to -**30**
2.7 mm Low-Profile Cortical, Locking	
Low-Profile Cortical Screw, 2.7 mm × 10 mm-34 mm Sizes: 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34 mm	VAR-**8827-10** to -**34**
Low-Profile Locking Screw, 2.7 mm × 10 mm-34 mm Sizes: 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34 mm	VAR-**8827L-10** to -**34**
3.0 mm Low-Profile Cortical, Variable Angle, Locking	
Low-Profile Cortical Screw, 3.0 mm × 8 mm-40 mm Sizes: 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40 mm	VAR-**8930-08** to -**40**
Low-Profile Variable-Angle Screw, 3.0 mm × 8 mm-40 mm Sizes: 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40 mm	VAR-**8930V-08** to -**40**
Low-Profile Locking Screw, 3.0 mm × 8 mm-40 mm Sizes: 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38 40 mm	VAR-**8930L-08** to -**40**

Screws cont.

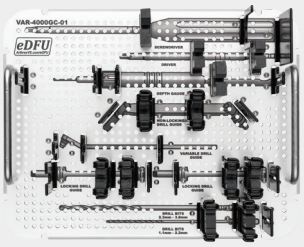
Product Description	Item Number
3.5 mm Low-Profile Cortical, Locking	
Low-Profile Cortical Screw, 3.5 mm × 8 mm-65 mm Sizes: 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 65 mm	VAR-**8835-08** to -**65**
Low-Profile Locking Screw, 3.5 mm × 10 mm-60 mm Sizes: 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60 mm	VAR-**8835L-10** to -**60**
4.0 mm Low-Profile Cortical, Locking	
Low-Profile Locking Screw, 4.0 mm × 18 mm-65 mm Sizes: 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 65 mm	VAR-**8840L-18** to -**65**

Equipment Part List

Product Description	Item Number
Disposable/Limited Reusable	
Drill Bit, solid, AO, 1.1 mm	VAR-**4016D**
Drill Bit, solid, AO, 1.5 mm	VAR-**4020D**
Drill Bit, solid, AO, 1.8 mm	VAR-**4024D**
Drill Bit, solid, AO, 2.3 mm	VAR-**4030D**
Drill Bit, solid, short, AO, 2.5 mm	VAR-**8943-30**
Drill Bit, solid, 2.7 mm	VAR-**8944-22**
Drill Bit, solid, AO, 2.8 mm	VAR-**4035D**
Drill Bit, solid, AO, 3.5 mm	VAR-**4040D**
Drill Bit, solid, short, AO, 1.1 mm	VAR-**4016SD**
Drill Bit, solid, short, AO, 1.5 mm	VAR-**4020SD**
Drill Bit, solid, short, AO, 1.8 mm	VAR-**4024SD**
Drill Bit, solid, short, AO, 2.3 mm	VAR-**4030SD**
Guidewire w/ Trocar, 0.86 mm × 80 mm	VAR-**8929K**
Guidewire w/ Trocar, 1.1 mm × 150 mm	VAR-**8933K**
Guidewire w/ Trocar, 1.3 mm × 150 mm	VAR-**8937K**
Instruments	
Depth Measuring Device, 1.6 mm/2.0 mm/2.4 mm	VAR-**2024DD**
Depth Measuring Device, 2.7 mm/3.0 mm/3.5 mm/4.0 mm	VAR-**8943-15**
T6 Driver, 1.6 mm/2.0 mm	VAR-**4020-01**
T8 Driver, 2.4 mm	VAR-**4024-01**
T10 Driver, 3.0 mm	VAR-**8944DH**
T15 Driver, 3.5 mm	VAR-**8941DH**
T6 Screwdriver, 1.6 mm/2.0 mm	VAR-**4020-02**
T8 Screwdriver, 2.4 mm	VAR-**4024-02**
T10 Screwdriver, 2.7 mm/3.0 mm	VAR-**8943-08**
T15 Screwdriver, 3.5 mm/4.0 mm	VAR-**8943-10**
Locking Plate Holder, 2.0 mm	VAR-**4020-03**
Locking Plate Holder, 2.4 mm	VAR-**4024-03**
Locking Plate Holder, 2.7 mm/3.0 mm	VAR-**8950-09**
Locking Plate Holder, 3.5 mm	VAR-**8954-07**
Screw Holding Forceps	VAR-**8941F**

Product Description	Item Number
Drill/Depth Guide, locking, 1.6 mm	VAR-**4016DG**
Drill/Depth Guide, locking, 2.0 mm	VAR-**4020DG**
Drill/Depth Guide, locking, 2.4 mm	VAR-**4024DG**
Drill/Depth Guide, locking, 3.0 mm	VAR-**4030DG**
Drill/Depth Guide, locking, 3.5 mm	VAR-**4035DG**
Drill/Depth Guide, locking, 4.0 mm	VAR-**4040DG**
Drill Guide, 1.1 mm	VAR-**4016TDG**
Tap/Drill Guide, 1.5 mm	VAR-**4020TDG**
Tap/Drill Guide, 1.8 mm	VAR-**4024TDG**
Tap/Drill Guide, 2.0 mm	VAR-**8943-31**
Tap/Drill Guide, 2.3 mm	VAR-**4030TDG**
Tap/Drill Guide, 2.4 mm	VAR-**8943-14**
BB-Tak, small, threaded	VAR-**8933TBB**
BB-Tak, small	VAR-**8933BB**
BB-Tak, large, threaded	VAR-**8941TBB**
BB-Tak, large	VAR-**8941BB**
Drill Guide, variable, 1.6 mm	VAR-**4016VDG**
Drill Guide, variable, 2.0 mm	VAR-**4020VDG**
Drill Guide, variable, 2.4 mm	VAR-**4024VDG**
Drill Guide, variable, 3.0 mm	VAR-**4030VDG**
Bone Tap, 2.0 mm	VAR-**4020T**
Bone Tap, 2.4 mm	VAR-**4024T**
Bone Tap, 2.7 mm	VAR-**4027T**
Bone Tap, 3.0 mm	VAR-**4030T**
K-Wire Drill Guide, 0.86 mm (1.6 mm/2.0 mm)	VAR-**4020KDG**
K-Wire Drill Guide, 1.14 mm (2.4 mm)	VAR-**4024KDG**
K-Wire Drill Guide, 1.14 mm (2.7 mm/3.0 mm)	VAR-**4030KDG**
K-Wire Drill Guide, 1.3 mm (3.5 mm)	VAR-**4035KDG**
Bending Plug, cannulated, 1.6/2.0 mm	VAR-**4020-04**
Bending Plug, cannulated, 2.4 mm	VAR-**4024-04**
Bending Plug, cannulated, 2.7 mm	VAR-**4027-04**
Bending Plug, cannulated, 3.0 mm	VAR-**4030-04**
Bending Plug, cannulated, 3.5 mm	VAR-**4035-04**
Bending Iron, small, 1.6 mm/2.0 mm	VAR-**4000-07**
Bending Iron, medium, 2.4 mm/3.0 mm	VAR-**4000-08**
Bending Iron, large 3.5 mm/broad 3.5 mm	VAR-**4000-09**
Freer Elevator	VAR-**4000-10**
Hohmann Retractor, double ended, 6 mm/10 mm	VAR-**4000-11**
Ikuta Clamp	VAR-**4000-12**
Lobster Clamp, mini	VAR-**4000-13**
Lobster Clamp, mini, radiolucent	VAR-**4000-14**
Periosteal Elevator, 6 mm curved blade	VAR-**4000-15**
Pliers, needle nose	VAR-**4000-16**
Pointed Reduction Forceps	VAR-**4000-17**
Reduction Forceps, guidewire	VAR-**4000-18**
Sharp Hook	VAR-**4000-19**
Termite Forceps	VAR-**4000-20**
Toothed Reduction Forceps, Kocher	VAR-**4000-21**

Cases and Caddies

Image	Product Description	Item Number
	OrthoLine™ Case	VAR-**4000GC**
	Generic Case Insert	VAR-**4000GC-01**
	1.6 mm Screw Caddy	VAR-**3016SC-01**
	2.0 mm Screw Caddy	VAR-**3020SC-01**
	2.4 mm Screw Caddy	VAR-**3024SC-01**
	2.7 mm Screw Caddy	VAR-**4027SC-01**

Cases and Caddies cont.

Image	Product Description	Item Number
	3.0 mm Screw Caddy	VAR-**3030SC-01**
	3.5 mm/4.0 mm Screw Caddy	VAR-**4035SC-02**
	Bending Plug Caddy	VAR-**4000BPC**

Products advertised in this surgical technique guide may not be available in all countries. For information on availability, please contact Arthrex Customer Service or your local Arthrex representative.

Reference

1. Arthrex, Inc. Data on file (APT 05162). Naples, FL; 2021.

Arthrex® Vet Systems

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