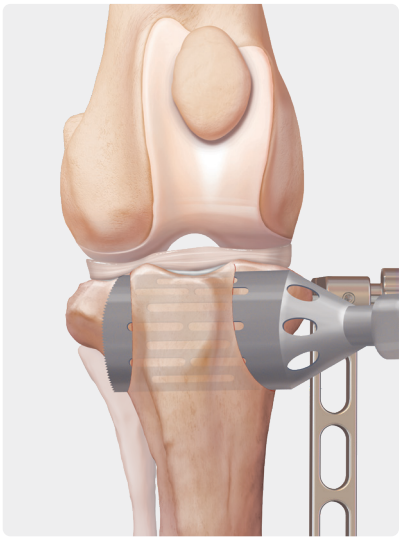
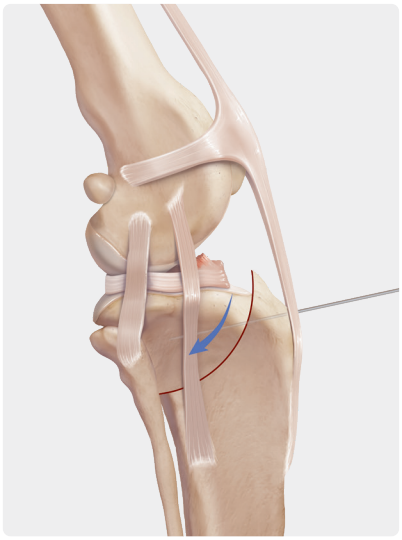
# TPLO Plate System

Surgical Technique for Tibial Plateau Leveling Osteotomy
With *Internal*Brace™ Ligament Augmentation

Arthrex®
Vet Systems

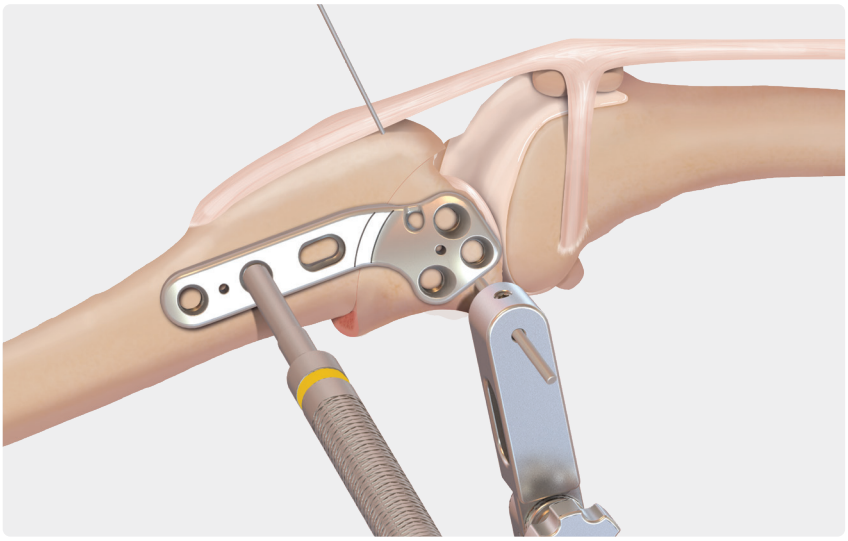
## Surgical Technique





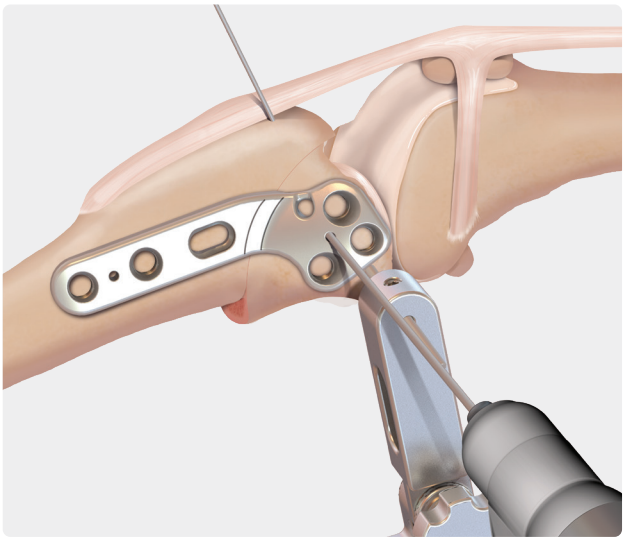
**01a, 01b**

Perform a tibial plateau leveling osteotomy (TPLO) with or without a standard TPLO jig and the appropriate size saw blade. Secure the osteotomy using a Kirschner wire (K-wire) placed across the tibial tuberosity.



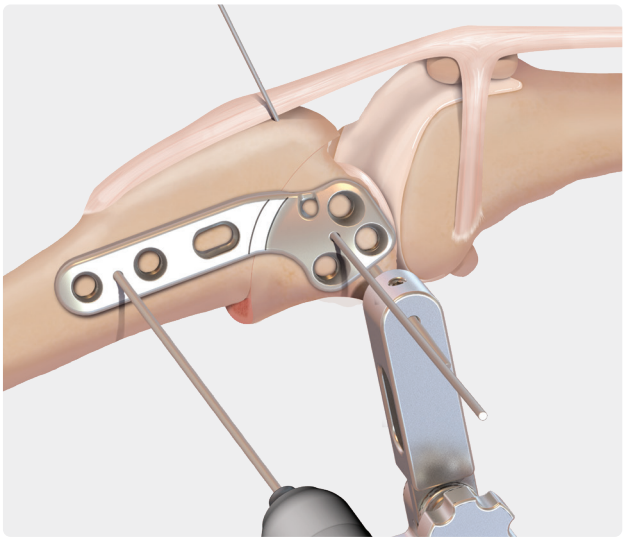
**02**

To properly align the TPLO plate, place the proximal screw holes in the center of the proximal fragment. Place the distal portion of the plate in the center of the distal fragment and align the laser lines with the osteotomy.



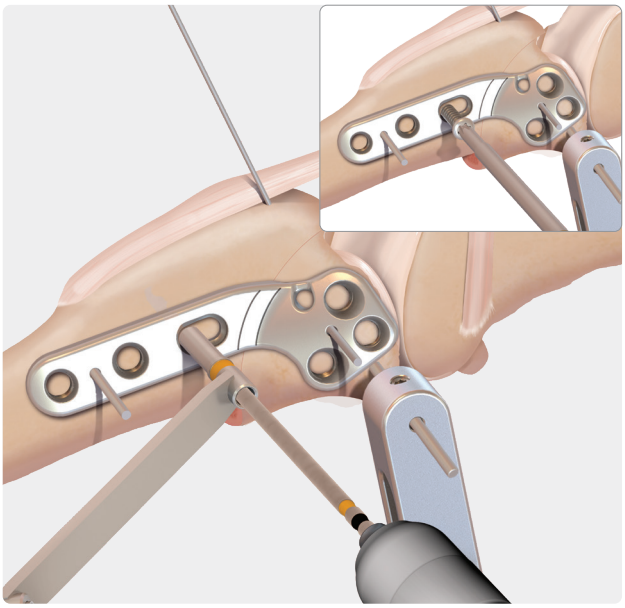
**03**

After placing the plate in the center of the proximal fragment, insert the proximal K-wire.



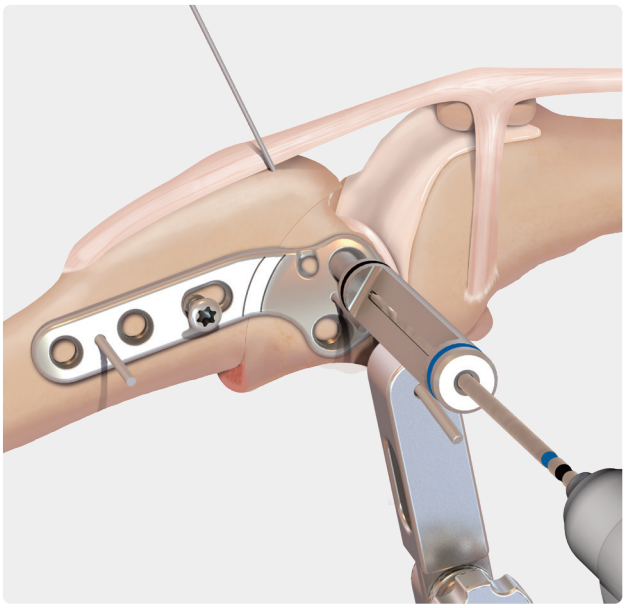
**04**

After aligning the plate with the tibial diaphysis, insert the distal K-wire to secure the plate.



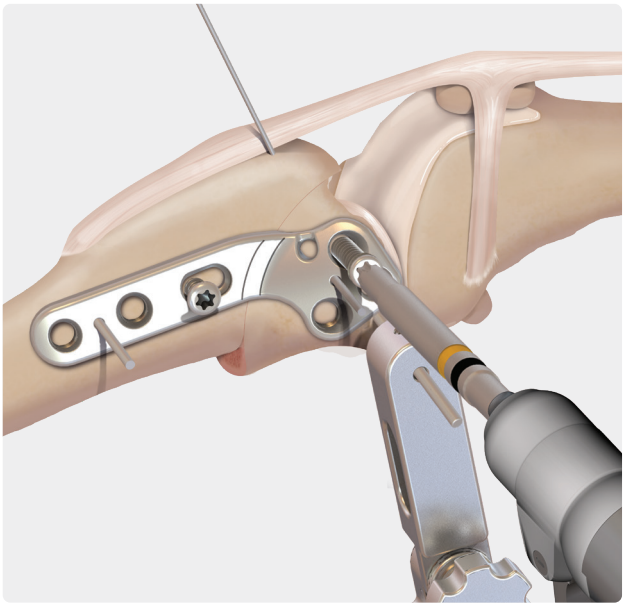
**05**

Insert a cortical screw in the compression position. This screw should be left slightly loose but in contact with the plate. Use the drill guide and appropriate drill bit to drill a hole in the compression position.



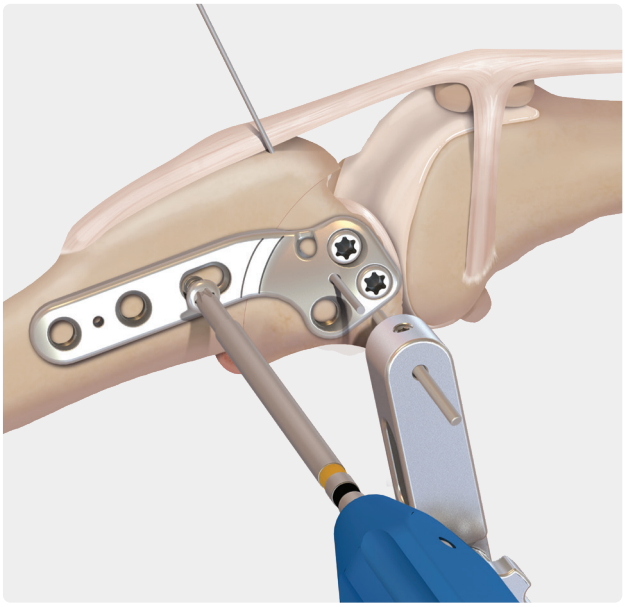
**06**

Use the locking drill guide to drill the hole and measure its depth to the appropriate length. For a more accurate measurement, use a depth gauge.



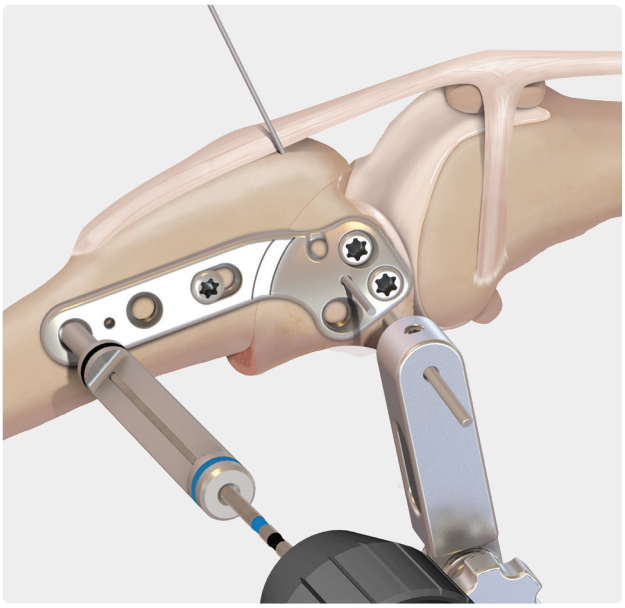
**07**

Place the locking screws in the proximal fragment.



**08**

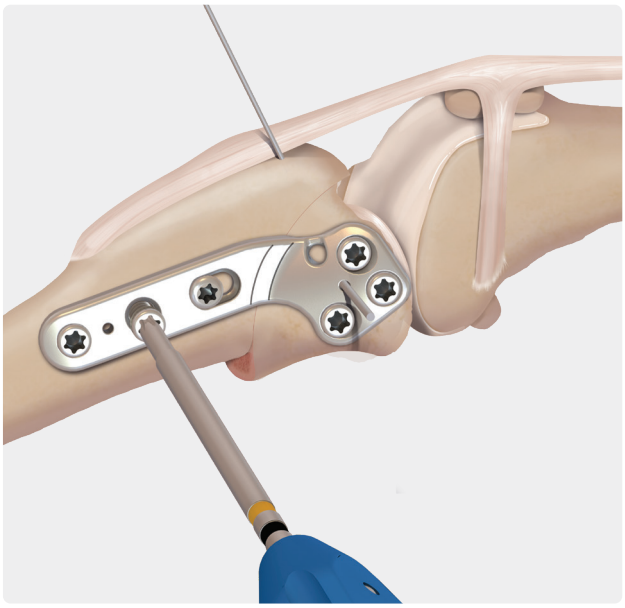
After removing the distal K-wire, tighten the compression screw by hand.



**09**

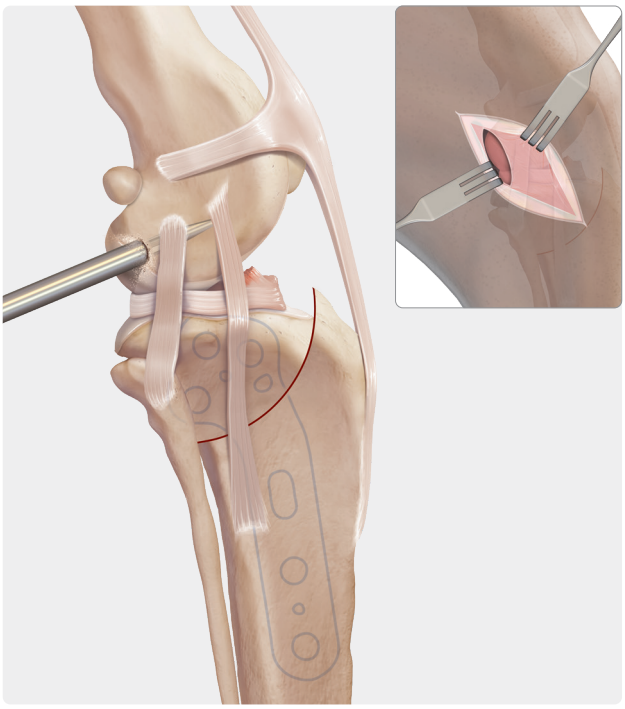
After tightening the compression cortical screw, insert the locking screws in the distal holes and remove the jig.

> **Note:** Prior to placement of the 2 distal locking screws, it is recommended to tap the cis cortex with the appropriate size tap.



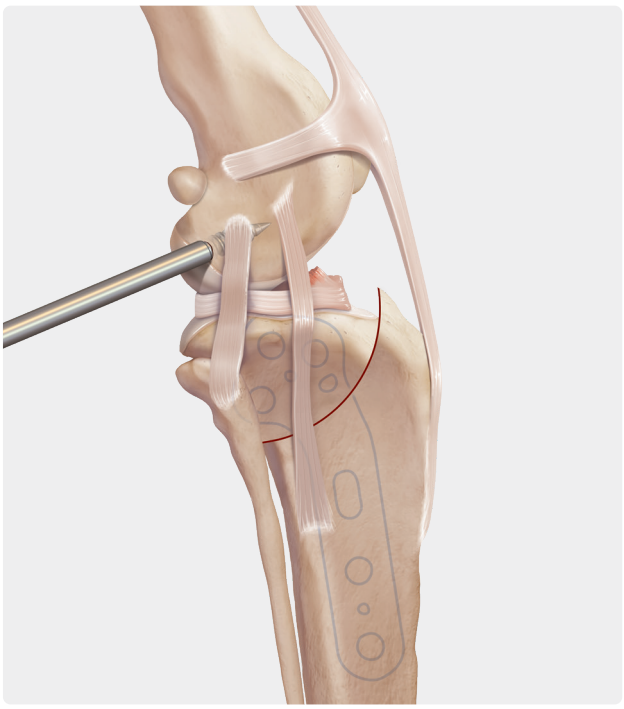
**10**

After all screws are placed, use a screwdriver to tighten each screw by hand and then remove the K-wire.



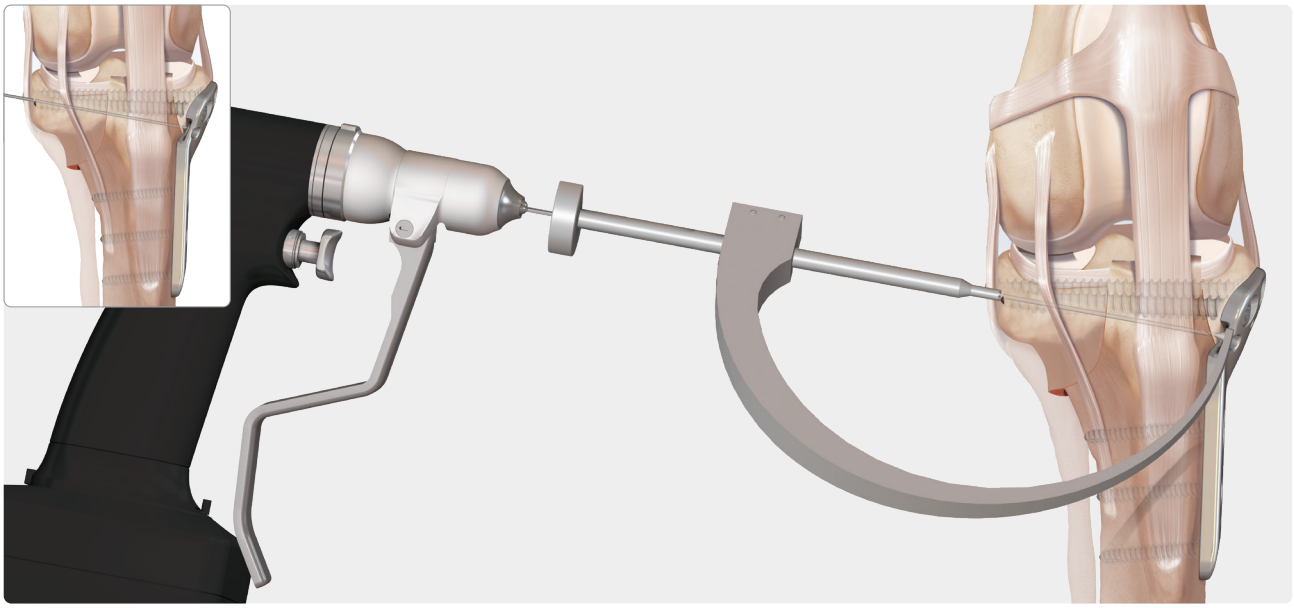
**11**

Expose the caudal aspect of the lateral femoral condyle. Drill holes for the SwiveLock® anchor using the appropriate size bit.



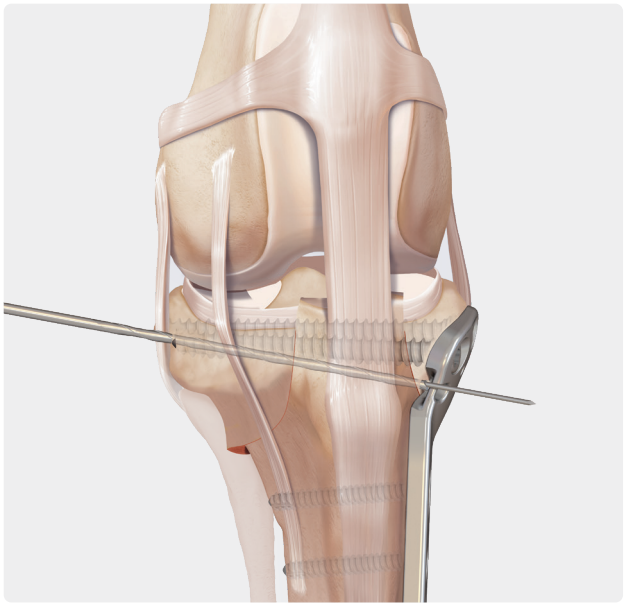
**12**

Tap the lateral femoral drill hole for the SwiveLock anchor using the appropriate size tap to create threads for the anchor to be inserted.



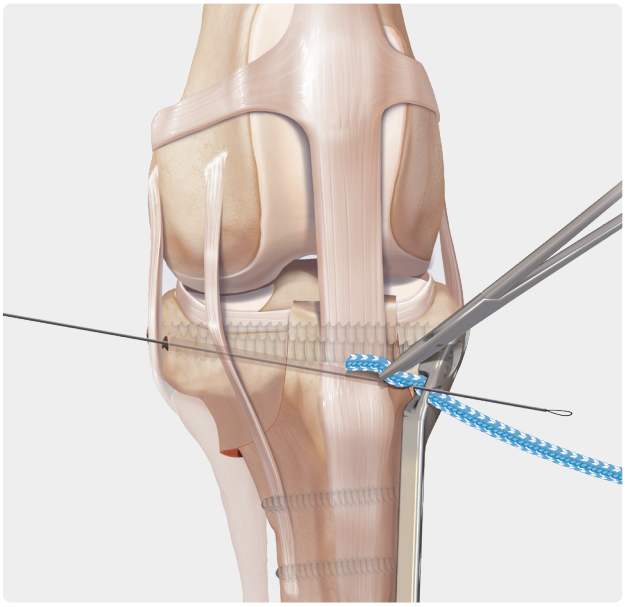
**13**

After exposing the tibial tunnel starting point behind the long digital extensor (LDE) groove, place the tip of the aiming guide in the suture hole of the plate and cinch the drill guide sleeve into place to secure the drill guide to the tibia. Drill the appropriately sized K-wire for the tibial tunnel, lateral to medial, ensuring the K-wire exits near the open hole in the TPLO plate. Remove the drill guide after properly placing the K-wire.



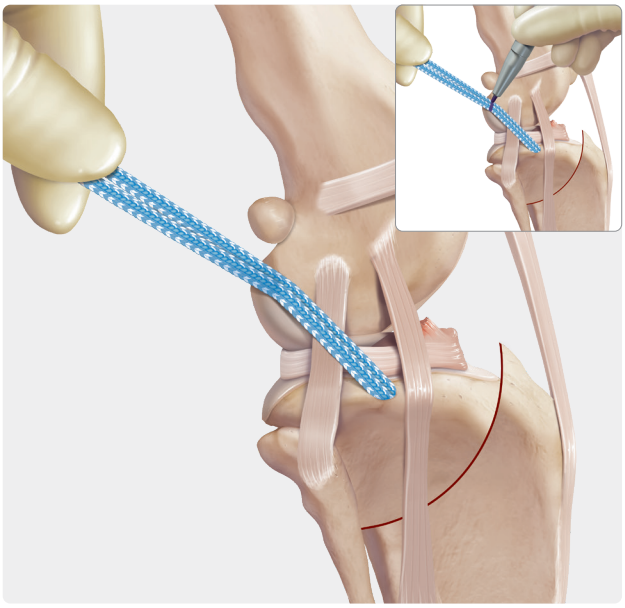
**14**

After placing the appropriately sized K-wire, use the appropriate size cannulated drill bit to create the tunnel.



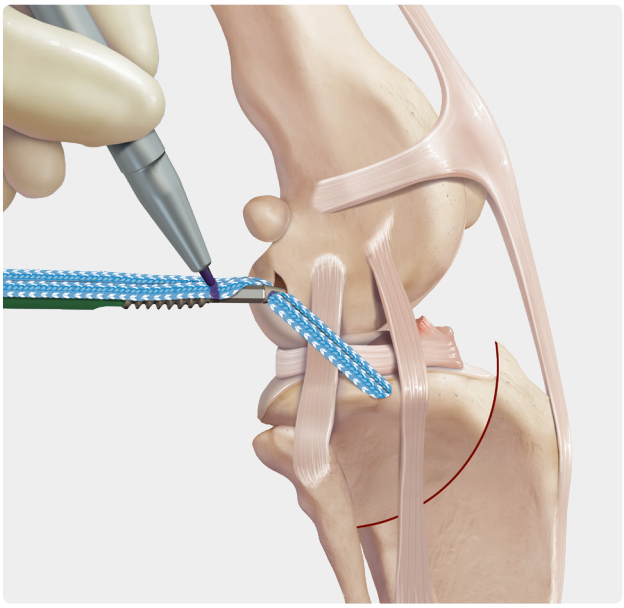
**15**

Loop the suture material through the suture hole on the TPLO plate and shuttle it through the tibial tunnel using the nitinol suture passer.



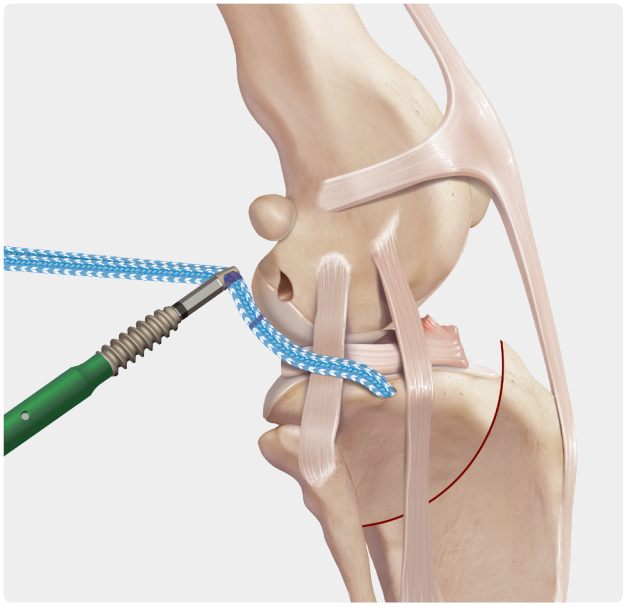
**16**

Pull both limbs of the suture material taut and lay over the predrilled hole in the femur. Use a pen to mark the location of the center of the hole on the suture (inset).



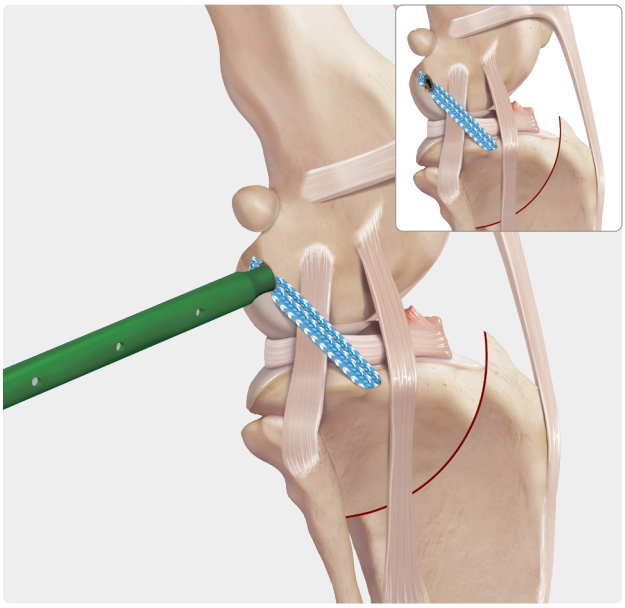
**17**

Slide the anchor eyelet over the mark created in Step 16. Pull both limbs of the suture material up the shaft of the SwiveLock® anchor and mark the location of the laser line on the suture.



**18**

Move the eyelet to the mark on the suture material created in Step 17 and advance the anchor and suture into the F2 tunnel. If necessary, use a mallet to advance the eyelet into the tunnel until the tip of the anchor is at the entrance to the femoral hole.

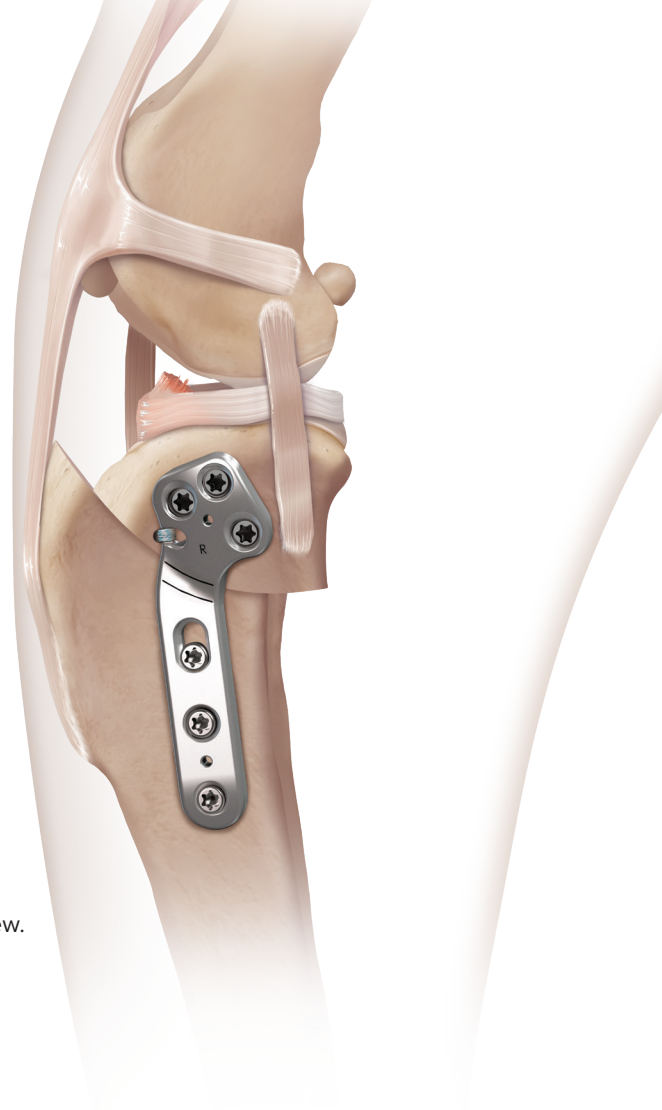


**19**

If the joint is secure, advance the anchor fully into the tunnel. Remove the driver from the anchor in the appropriate manner. Cut excess suture flush at the anchor.

**20**

Cranial view.

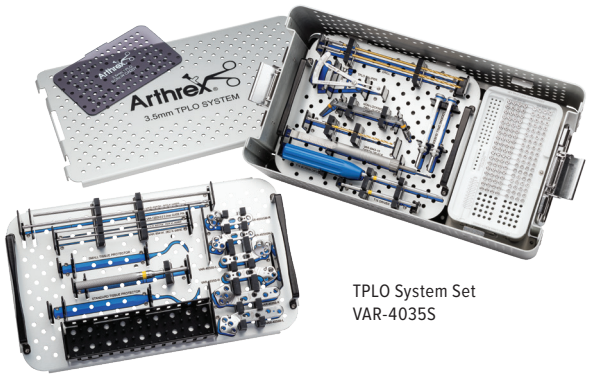


**21**

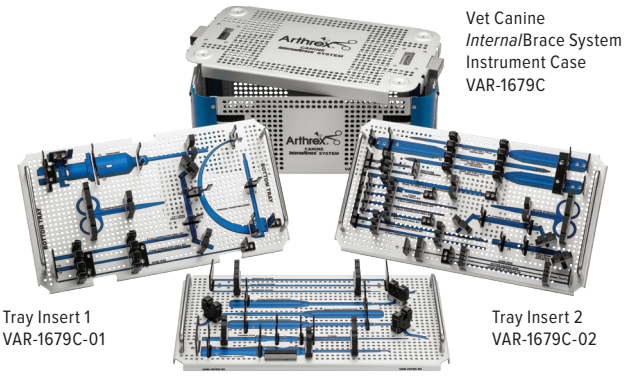
Medial view.

## Surgical Pearls

- Preoperative planning allows repeatable and accurate placement of the osteotomy
- Difficult fragment rotation may be due to poorly centered osteotomy, incomplete osteotomy, or tibiofibular synostosis
- The stifle should be held in flexion while sawing to prevent the popliteal vessels from being compressed against the caudal aspect of the tibia (risk of bleeding)
- No attempt should be made to align the medial cortices of the tibial fragments
- Better interfragmentary compression can be achieved with the following order:
  - 2 locking screws in the proximal fragment
  - Compression screw in the distal fragment
- Do not overtighten the *Internal*Brace™ ligament augmentation; the tibia should be free to rotate to neutral-mild internal rotation (about 5°-10°)
- During implantation of the 2.7 mm TPLO plate, it is recommended to tap the cis cortex when placing the 2 distal locking screws using the VAR-4027T tap




TPLO System Set
VAR-4035S



Vet Canine
*Internal*Brace System
Instrument Case
VAR-1679C

Tray Insert 1
VAR-1679C-01

Tray Insert 2
VAR-1679C-02

Tray Insert 3
VAR-1679C-03

## Product Weight Chart

All weight ranges are suggestions based on the ultimate load of the product and/or on our veterinary consultant's recommendation. It is up to the veterinarian to determine the proper product, application, technique, and weight range for using the selected product.


| *Internal*Brace™ System Anchors | TPLO Plate Sizes | | | | | | *Internal*Brace System Sutures |
|---|---|---|---|---|---|---|---|
| 3.5 mm SwiveLock® anchor | 2.7 mm | | | | | | LabralTape™ suture, 1.5 mm<br>FiberTape® suture, 2.0 mm |
| 3.5 mm/4.75 mm SwiveLock anchor | | 3.0 mm | | | | | LabralTape suture, 1.5 mm<br>FiberTape suture, 2.0 mm |
| 3.5 mm/4.75 mm SwiveLock anchor | | | 3.5 mm, small | | | | LabralTape suture, 1.5 mm<br>FiberTape suture, 2.0 mm |
| 4.75 mm SwiveLock anchor | | | | 3.5 mm, standard | | | FiberTape suture, 2.0 mm |
| 4.75 mm/5.5 mm SwiveLock anchor | | | | | 3.5 mm, broad | | FiberTape suture, 2.0 mm |
| 5.5 mm SwiveLock anchor | | | | | | 4.5 mm | FiberTape suture, 2.0 mm |

## Size Chart

**Size Selection**

| Plate Size | K-Wire Hole | Drill Bit Locking Screw | Drill Bit Cortical Screw | *Internal*Brace System Tap |
|---|---|---|---|---|
| 2.7 mm | VAR-8933K<br>1.14 mm (0.045 in) | VAR-8944-22<br>2.0 mm | VAR-8944-22<br>2.0 mm | VAR-1678-03 |
| 3.0 mm | VAR-8933K<br>1.14 mm (0.045 in) | VAR-4030D<br>2.3 mm | VAR-4030SD<br>2.3 mm | VAR-1678-03 |
| 3.5 mm, small | VAR-8941K<br>1.57 mm (0.062 in) | VAR-4035D<br>2.8 mm | VAR-8943-42<br>2.5 mm | VAR-2324PTB |
| 3.5 mm, standard | VAR-8941K<br>1.57 mm (0.062 in) | VAR-4035D<br>2.8 mm | VAR-8943-42<br>2.5 mm | VAR-1678-03 |
| 3.5 mm, broad | VAR-8941K<br>1.57 mm (0.062 in) | VAR-4035D<br>2.8 mm | VAR-8943-42<br>2.5 mm | VAR-2324PTB |
| 4.5 mm | VAR-8941K<br>1.57 mm (0.062 in) | VAR-4045D<br>3.8 mm | VAR-8970-30<br>3.0 mm | VAR-2324PTB |

**Size Selection**

| Plate Size | *Internal*Brace System Suture | *Internal*Brace System Anchor | *Internal*Brace System Femoral Drill Bit | *Internal*Brace System Tibial Drill Bit |
|---|---|---|---|---|
| 2.7 mm | AR-7276<br>LabralTape suture, 1.5 mm | VAR-2325PSLC<br>3.5 mm SwiveLock anchor | VAR-1678-05<br>2.7 mm | VAR-8933-20C<br>2.0 mm |
| | AR-7237<br>FiberTape suture, 2.0 mm | | | |
| 3.0 mm | AR-7276<br>LabralTape suture, 1.5 mm | VAR-2325PSLC<br>3.5 mm SwiveLock anchor | VAR-1678-05<br>2.7 mm | VAR-8933-20C<br>2.0 mm |
| | AR-7237<br>FiberTape suture, 2.0 mm | VAR-2324PSLC<br>4.75 mm Swivelock anchor | VAR-1927D<br>3.6 mm | |
| 3.5 mm, small | AR-7276<br>LabralTape suture, 1.5 mm | VAR-2325PSLC<br>3.5 mm SwiveLock anchor | VAR-1678-05<br>2.7 mm | VAR-8933-20C<br>2.0 mm |
| | AR-7237<br>FiberTape suture, 2.0 mm | VAR-2324PSLC<br>4.75 mm SwiveLock anchor | VAR-1927D<br>3.6 mm | |
| 3.5 mm, standard | AR-7237<br>FiberTape suture, 2.0 mm | VAR-2324PSLC<br>4.75 mm SwiveLock anchor | VAR-1927D<br>3.6 mm | VAR-8737-09<br>2.5 mm |
| 3.5 mm, broad | AR-7237<br>FiberTape suture, 2.0 mm | VAR-2324PSLC<br>4.75 mm SwiveLock anchor | VAR-1927D<br>3.6 mm | VAR-8737-09<br>2.5 mm |
| 4.5 mm | AR-7237<br>FiberTape suture 2.0 mm | VAR-2323PSLC<br>5.5 mm SwiveLock anchor | VAR-1927D<br>3.6 mm | VAR-8737-09<br>2.5 mm |

# Ordering Information

| TPLO Plates | |
|---|---|
| 2.7 mm TPLO Plates | |
| TPLO locking plate, 2.7 mm, standard, left **(a)** | VAR-4027S-L |
| TPLO locking plate, 2.7 mm, standard, right | VAR-4027S-R |
| 3.0 mm TPLO Plates | |
| TPLO locking plate, 3.0 mm, standard, left **(b)** | VAR-4130S-L |
| TPLO locking plate, 3.0 mm, standard, right | VAR-4130S-R |
| 3.5 mm TPLO Plates | |
| TPLO locking plate, 3.5 mm, small, left **(c)** | VAR-4035SM-L |
| TPLO locking plate, 3.5 mm, small, right | VAR-4035SM-R |
| TPLO locking plate, 3.5 mm, standard, left **(d)** | VAR-4035S-L |
| TPLO locking plate, 3.5 mm, standard, right | VAR-4035S-R |
| TPLO locking plate, 3.5 mm, broad, left **(e)** | VAR-4035B-L |
| TPLO locking plate, 3.5 mm, broad, right | VAR-4035B-R |
| 4.5 mm TPLO Plates | |
| TPLO locking plate, 4.5 mm, standard, left **(f)** | VAR-4045S-L |
| TPLO locking plate, 4.5 mm, standard, right | VAR-4045S-R |

**(a)**

**(b)**

**(c)**

**(d)**

**(e)**

**(f)**

| TPLO Screws | |
|---|---|
| 2.7 mm Low-profile, Cortical, Locking, Stainless Steel | |
| Low-profile cortical screw,<br>2.7 mm × 10-34 mm<br>Sizes: 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34 mm | VAR-8827-10<br>to -34 |
| Low-profile locking screw,<br>2.7 mm × 10-34 mm<br>Sizes: 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34 mm | VAR-8827L-10<br>to -34 |
| 3.0 mm Low-profile, Cortical, Locking, Variable-Angle, Titanium | |
| Low-profile cortical screw,<br>2.7 mm × 8-40 mm<br>Sizes: 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40 mm | VAR-8930-08<br>to -40 |
| Low-profile variable-angle screw,<br>3.0 mm × 8-40 mm<br>Sizes: 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40 mm | VAR-8930V-08<br>to -40 |
| Low-profile locking screw,<br>3.0 mm × 8-40 mm<br>Sizes: 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40 mm | VAR-8930L-08<br>to -40 |
| 3.5 mm Low-profile, Cortical, Locking, Stainless Steel | |
| Low-profile cortical screw,<br>3.5 mm × 16-50 mm<br>Sizes: 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50 mm | VAR-8835-16<br>to -50 |
| Low-profile locking screw,<br>3.5 mm × 16-50 mm<br>Sizes: 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50 mm | VAR-8835L-16<br>to -50 |
| 4.5 mm Low-profile, Cortical, Locking, Stainless Steel | |
| Low-profile cortical screw,<br>4.5 mm × 24-65 mm<br>Sizes: 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 65 mm | VAR-8845-24<br>to -65 |
| Low-profile locking screw,<br>4.5 mm × 24-65 mm<br>Sizes: 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 65 mm | VAR-8845L-24<br>to -65 |

**Instruments**

| | |
|---|---|
| 2.7 mm Instruments | |
| TPLO tissue protector, small | VAR-4000TPSM |
| TPLO caliper | VAR-4000-CAL |
| Nonlocking drill guide, 2.0 mm/3.0 mm | VAR-8943-31 |
| Locking drill guide, 2.7 mm | VAR-8950-07 |
| Depth device, low profile, 2.7 mm/3.5 mm | VAR-8943-15 |
| T10 driver | VAR-8944DH |
| T10 screwdriver | VAR-8943-08 |
| Screw holding forceps | VAR-8941F |
| Locking plate holder, 2.7 mm | VAR-8950-09 |
| Mini mallet, 7 in | VAR-8826M |
| Low-profile Hohmann retractor | VAR-13210 |
| Wire cutter, 0.062 in | VAR-8956-10 |
| 3.0 mm Instruments | |
| TPLO tissue protector, small | VAR-4000TPSM |
| TPLO caliper | VAR-4000-CAL |
| Bone tap, 3.0 mm | VAR-4030T |
| Drill/depth guide, locking, 3.0 mm | VAR-4030DG |
| Tap/drill guide, 3.0 mm/2.3 mm | VAR-4030TDG |
| Drill guide, variable, 3.0 mm | VAR-4030VDG |
| Screwdriver, T10 hexalobe | VAR-8943-08 |
| Depth measuring device, 2.7 mm/3.0 mm/3.5 mm/4.0 mm | VAR-8943-15 |
| Driver, T10 hexalobe | VAR-8944DH |
| Mini mallet, 7 in | VAR-8826M |
| Low-profile Hohmann retractor | VAR-13210 |
| Locking plate holder, 2.7 mm/3.0 mm | VAR-8950-09 |
| 3.5 mm Instruments | |
| TPLO tissue protector, small | VAR-4000TPSM |
| TPLO tissue protector, standard | VAR-4000TPS |
| TPLO caliper | VAR-4000-CAL |
| Nonlocking drill guide, 2.5 mm/3.5 mm | VAR-8943-14 |
| Locking drill guide, 3.5 mm | VAR-4035DG |
| Locking drill guide, 3.5 mm, cortical screw | VAR-8943-43 |
| Depth device, low profile, 2.7 mm/3.5 mm | VAR-8943-15 |
| T15 driver | VAR-8941DH |
| T15 screwdriver | VAR-8943-10 |
| Screw holding forceps | VAR-8941F |
| Locking plate holder, 3.5 mm | VAR-8954-07 |
| Mini mallet, 7 in | VAR-8826M |
| Low-profile Hohmann retractor | VAR-13210 |
| Wire cutter, 1.57 mm (0.062 in) | VAR-8956-10 |
| 4.5 mm Instruments | |
| TPLO tissue protector, standard | VAR-4000TPS |
| TPLO caliper | VAR-4000-CAL |
| Nonlocking drill guide, 3.0 mm/4.5 mm | VAR-8970-02 |
| Locking drill guide, 4.5 mm | VAR-4045DG |
| Locking drill guide, 4.5 mm, cortical screw | VAR-8970-01 |
| Depth device, 4.5 mm | VAR-8970-07 |
| T20 Driver | VAR-8970-03 |
| T20 Screwdriver | VAR-8970-04 |
| T20 Screwdriver, self-retaining | VAR-4045-02 |
| Screw holding forceps | VAR-8941F |
| Locking plate holder, 4.5 mm | VAR-4045-01 |
| Mini mallet, 7 in | VAR-8826M |
| Wire cutter, 1.57 mm (0.062 in) | VAR-8956-10 |
| Low-profile Hohmann retractor | VAR-13210 |

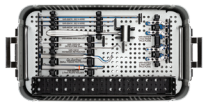
**Disposables and Limited Reusables**

| | |
|---|---|
| 2.7 mm Disposables and Limited Reusables | |
| Drill bit, 2.0 mm | VAR-8944-22 |
| K-wire, 1.14 mm (0.045 in) | VAR-8933K |
| K-wire, 1.57 mm (0.062 in) | VAR-8941K |
| K-wire, 2.3 mm (0.092 in) | VAR-8967K |
| Small osteotome, 5 mm | VAR-13203-05 |
| Wire cutter, 1.57 mm (0.062 in) | VAR-8956-10 |
| Low-profile Hohmann retractor | VAR-13210 |
| 3.0 mm Disposables and Limited Reusables | |
| K-wire, 2.3 mm (0.092 in) | VAR-8967K |
| Guidewire w/ trocar tip, 1.3 mm × 150 mm (3.5 mm) | VAR-8937K |
| Drill bit, solid, AO, 2.3 mm | VAR-4030D |
| Guidewire w/ trocar, 1.1 mm | VAR-8933K |
| Drill bit short, solid, AO, 2.3 mm | VAR-4030SD |
| Small osteotome, 5 mm | VAR-13203-05 |
| 4.5 mm Disposables and Limited Reusables | |
| K-wire, 1.57 mm (0.062 in) | VAR-8941K |
| K-wire, 2.3 mm (0.092 in) | VAR-8967K |
| Guide pin, 3.0 mm (0.118 in) | VAR-13303-3.0 |
| Drill bit, 3.8 mm | VAR-4045D |
| Drill bit, 3.0 mm | VAR-8970-30 |
| Small osteotome, 5 mm | VAR-13203-05 |
| Small osteotome, 5 mm | VAR-13203-05 |

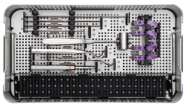
**Disposables and Limited Reusables**

| | |
|---|---|
| Implants for *Interna*Brace™ System | |
| SwiveLock® anchor, 4.75 mm | VAR-2324PSLC |
| FiberTape® suture, 2.0 mm | AR-7237 |
| Instrumentation for *Interna*Brace System | |
| Spade-tip drill bit, 4.75 mm/5.5 mm SwiveLock suture | VAR-1927D |
| SwiveLock tap, 4.75 mm | VAR-2324PTB |
| Aiming guide | VAR-2810 |
| Disposables/Limited Reusables for *Interna*Brace System | |
| K-wire, 1.14 mm (0.045 in) | VAR-8933K |
| K-wire, 1.24 mm (0.049 in) | VAR-8920P |
| Suture passing wire | VAR-1255-08 |
| Cannulated drill bit, 2.5 mm | VAR-8737-09 |
| Cannulated drill bit, 2.7 mm | VAR-8911DC |

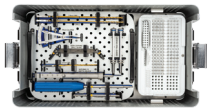
### 2.7 mm Sets and Cases

| | | |
|---|---|---|
|  | TPLO set with instruments, 2.7 mm | VAR-4027S |
|  | TPLO case with screw caddy, 2.7 mm | VAR-4027C |
|  | TPLO screw caddy, 2.7 mm | VAR-4027SC-01 |

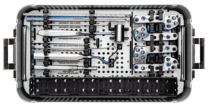
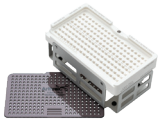
### 3.0 mm Sets and Cases

| | | |
|---|---|---|
|  | TPLO set with instrument, 3.0 mm | VAR-4030S |
|  | TPLO case with screw caddy, 3.0 mm | VAR-4030C |
|  | TPLO screw caddy, 3.0 mm | VAR-3030SC-01 |

### 3.5 mm Sets and Cases

| | | |
|---|---|---|
|  | TPLO set with instrument, 3.5 mm | VAR-4035S |
|  | TPLO case with screw caddy, 3.5 mm | VAR-4035C |
|  | TPLO screw caddy, 3.5 mm | VAR-4035SC-01 |

### 4.5 mm Sets and Cases

| | | |
|---|---|---|
|  | TPLO set with instrument, 4.5 mm | VAR-4045S |
|  | TPLO case with screw caddy, 4.5 mm | VAR-4045C |
|  | TPLO screw caddy, 4.5 mm | VAR-4045SC-01 |

This is not veterinary advice and Arthrex recommends that veterinarians be trained in the use of any particular product before using it in surgery. A veterinarian must always rely on his or her own professional clinical judgment when deciding whether to use a particular product. A veterinarian must always refer to the package insert, product label and / or instructions for use before using any Arthrex product. Products may not be available in all markets because product availability is subject to the regulatory and / or veterinary practices in individual markets. Please contact your Arthrex representative if you have questions about availability of products in your area.

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