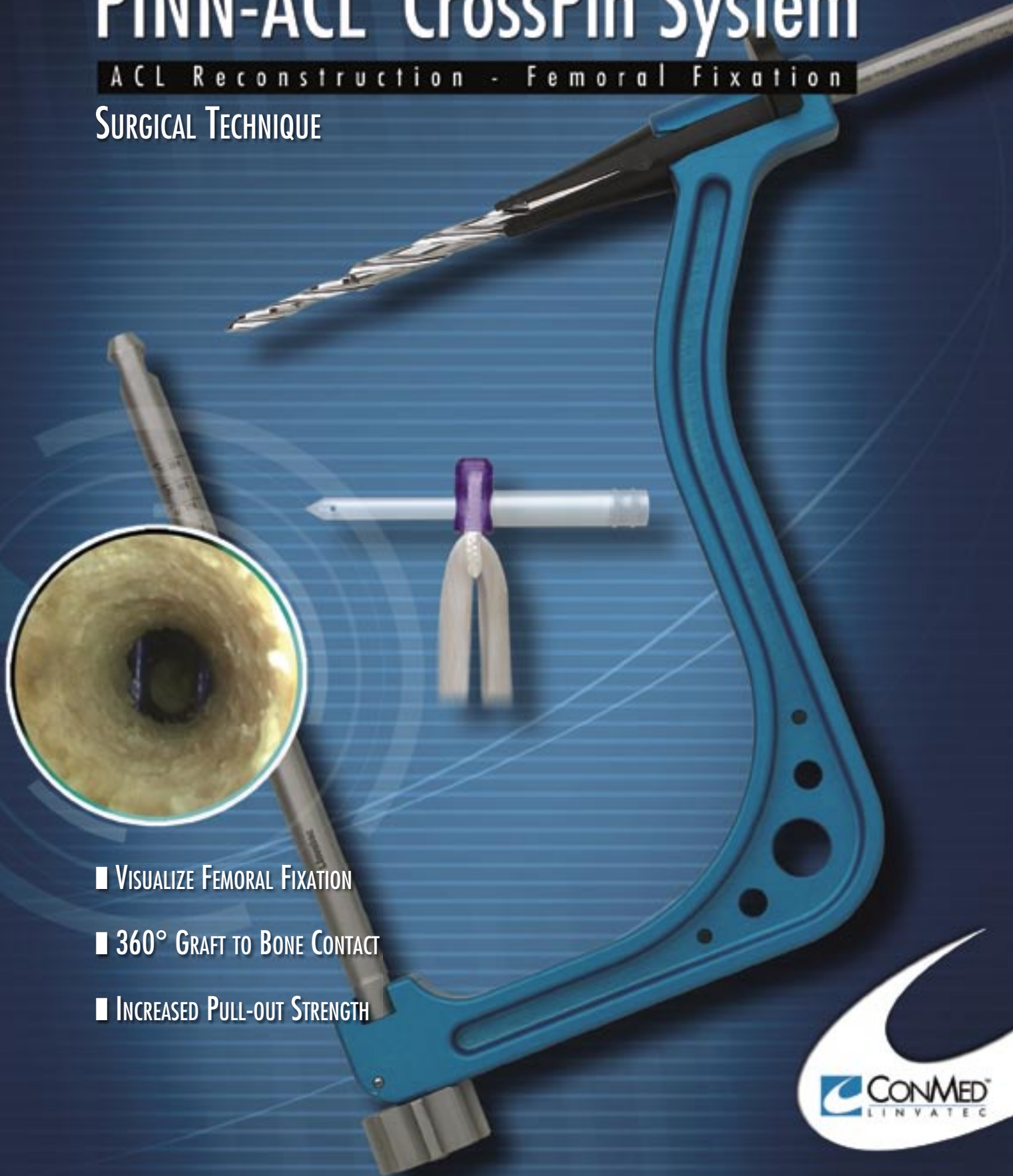


# PINN-ACL<sup>®</sup> CrossPin System

ACL Reconstruction - Femoral Fixation

## SURGICAL TECHNIQUE



- VISUALIZE FEMORAL FIXATION
- 360° GRAFT TO BONE CONTACT
- INCREASED PULL-OUT STRENGTH

# PINN-ACL<sup>®</sup> CROSSPIN SYSTEM

SURGICAL TECHNIQUE

## INTRODUCTION

The ConMed Linvatec Pinn-ACL CrossPin System is used to provide femoral fixation in anterior cruciate ligament (ACL) reconstruction using a soft tissue graft. The innovative design allows for increased pull-out strength due to the transverse fixation of the graft. Unique to this system is the superior implant strength and ability to utilize the transverse tunnel to visualize the exact point of femoral fixation. This surgical technique, along with the precision instrumentation, allows for reproducible clinical results.

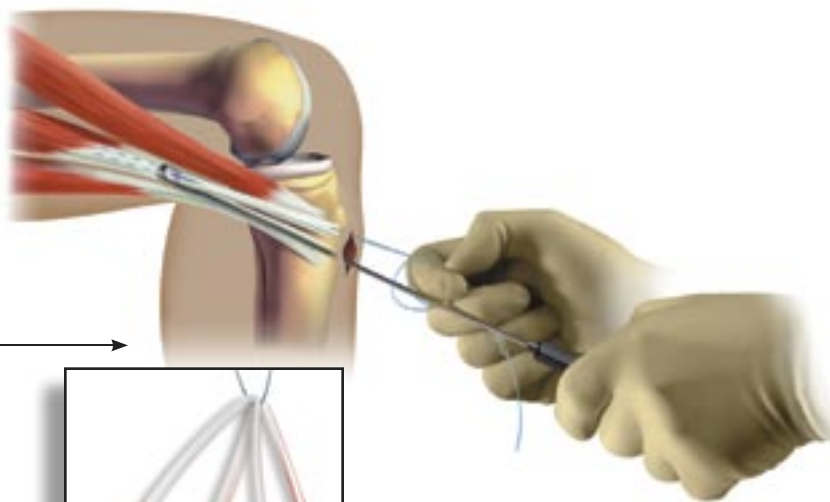
# GRAFT HARVESTING & PREPARATION

FOR GRACILIS TENDON & SEMITENDINOSUS TENDON

## STEP 1 — GRAFT PREPARATION

The semitendinosus and gracilis tendons are harvested. Each end of the individual graft bundles is whip stitched approximately 35mm to 40mm from the end. In virtually all patients, the length of the harvested semitendinosus and gracilis tendons should be 200mm.

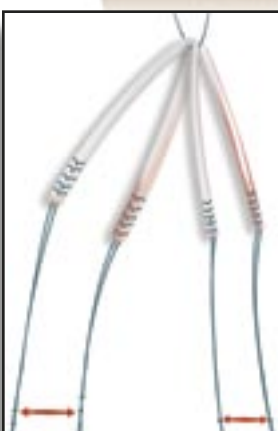
**Note:** Be sure to attach a sufficient length of suture to each graft bundle for tensioning the graft.



1

**1a.** Once whipstitching is complete, apply 2 knots to the semitendinosus suture strand and 1 knot to the gracilis suture strand to identify the individual tendons.

1a

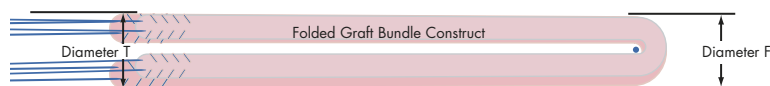


## STEP 2 — GRAFT SIZING

Using the ConMed Linvatec Graft Sizing Block (PS8832), measure the entire graft bundle diameter. Measurements of the femoral end and tibial end should be taken.

Based on the diameter of the femoral end of the graft bundle, select the appropriate size Graft Harness (8mm or 9mm). Leave the lead suture attached to the Graft Harness; the suture will be used to pass the graft. Place the Harness Holder Accessory (PS8889) onto the Grafix® Prep Table.

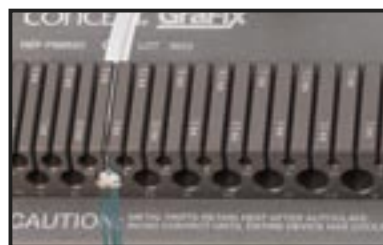
To load the graft strands into the Graft Harness, place the Graft Harness onto the Harness Holder Accessory (PS8889) and pass the graft strands individually through the continuous suture loop on the Graft Harness in the direction from the Graft Harness to the Harness Holder Accessory.



2



Femoral Bundle



Tibial Bundle

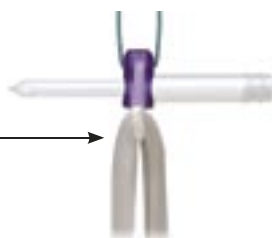
### Required Measurements

F	<input type="text"/>
T	<input type="text"/>

### Graft Diameters

**2a.** Center the graft bundle in the continuous loop of the Graft Harness for graft passage.

2a



# FEMORAL & TIBIAL TUNNEL CREATION

## STEP 3 — CREATE TUNNELS

The tibial and femoral tunnels are created using standard instruments from the Grafix® Cruciate Reconstruction System.

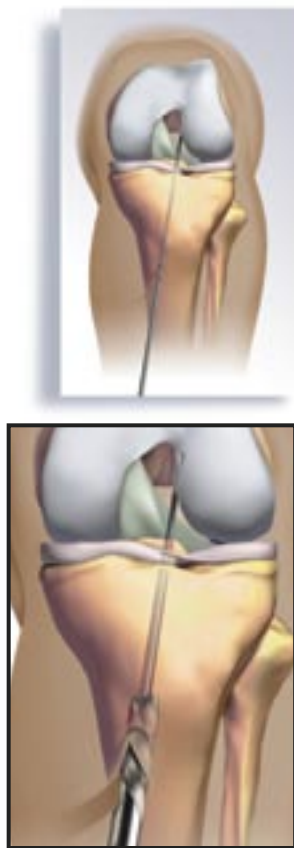
**3a.** Using the Pinn-ACL® Cruciate Guide, a guide pin is placed in the tibia.

3a



**3b.** An AccuDrill™ reamer of the appropriate size is used to create the tibial tunnel.

3b



**3c.** Select the correct Bullseye® Guide to leave 1–2mm of cortical back wall in the tunnel.

Insert the graft passing guide pin through the handle of the Bullseye® Guide and drill until it exits the lateral portion of the femur and skin.

3c



**3d.** A C-Reamer™ or Badger® Drill of the appropriate size (8mm or 9mm) is used to create the femoral socket. The tunnel should be sized to accommodate either the 8mm or 9mm Positioning Rod of the Pinn-ACL CrossPin System. The tunnel length of the femoral socket should be no less than 30mm (35mm is recommended). The graft passing guide pin will remain in place.

3d



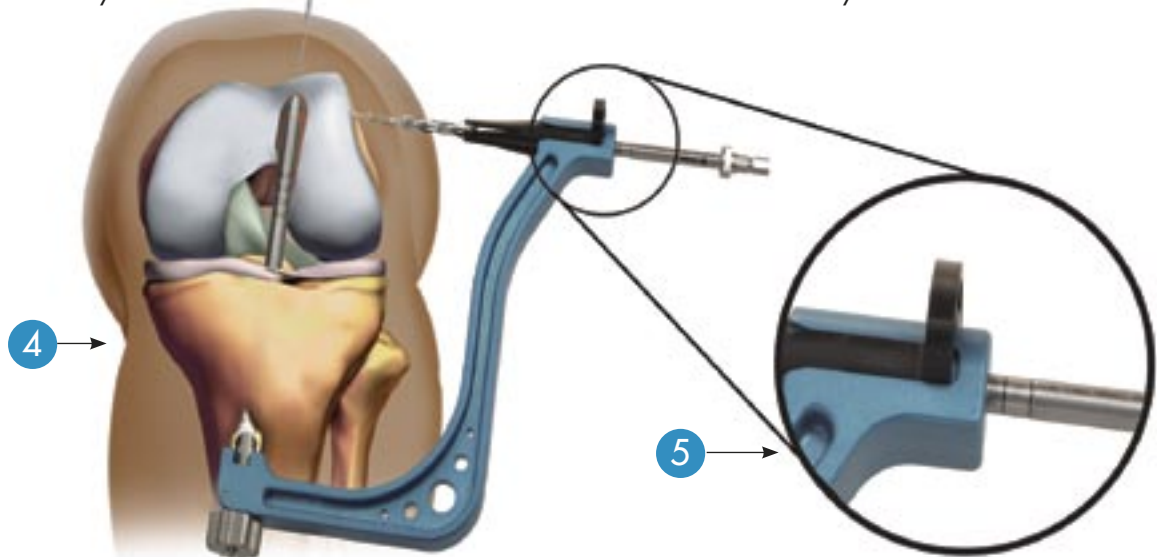
# U-GUIDE POSITION & CORTICAL LENGTH MEASUREMENT

## STEP 4 — U-GUIDE ASSEMBLY AND POSITION

Based on the diameter of the femoral tunnel, select the appropriate size Positioning Rod (8mm or 9mm) and assemble it onto the U-Guide. Slide the disposable Transverse Cannula onto the U-Guide body. (Note: The Transverse Cannula is packaged with the Graft Harness.)

With the U-Guide assembled, insert the Positioning Rod over the graft passing guide pin, through the tibial tunnel and into the femoral socket. When the U-Guide assembly is fully inserted, the laser etch marks on the Positioning Rod indicate the length of the femoral tunnel. (Note: Take caution to fully insert the Positioning Rod into the femoral socket until it contacts the top of the femoral socket before continuing. Alignment of the transverse tunnel is based on the positioning rod being firmly stopped against the ceiling of the femoral socket.) Remove the graft passing guide pin from the femoral tunnel.

After the U-Guide is fully inserted into the tunnels, rotate the U-Guide body until the Transverse Cannula mounted on the U-Guide body is directed toward the lateral condyle. The transverse tunnel will be drilled from the lateral to the medial condyle.

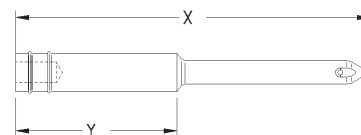


## STEP 5 — CROSSPIN IMPLANT SELECTION

With the U-Guide body in the correct orientation, insert the CrossPin Drill Bit into the drill guide aperture and identify the entrance point of the transverse tunnel. With the tip of the CrossPin Drill Bit touching the skin, use a scalpel to create a small 3–5mm incision this will assist the passage of the drill bit through the soft tissue to make contact with the lateral femoral cortex.

To identify the appropriate length CrossPin to be used, utilize the U-Guide and CrossPin Drill Bit as a caliper to first determine the length of the cortical side of the transverse tunnel, i.e., the distance from the lateral cortex of the femur to the lateral wall of the femoral tunnel. To measure this distance, firmly press the CrossPin Drill Bit against the cortical surface without drilling and read the laser etch depth markings where the drill bit enters the drill guide aperture. This measurement is important in selecting the appropriate size CrossPin implant for cortical side fixation. Each CrossPin has a cortical length designed to occupy the cortical side of the transverse tunnel, the available cortical lengths being 15mm, 20mm and 25mm. The proper length CrossPin is the one whose cortical length is less than, or equal to, the measured cortical tunnel length. Select the proper size CrossPin from the table below.

### CROSSPIN IMPLANT SIZES



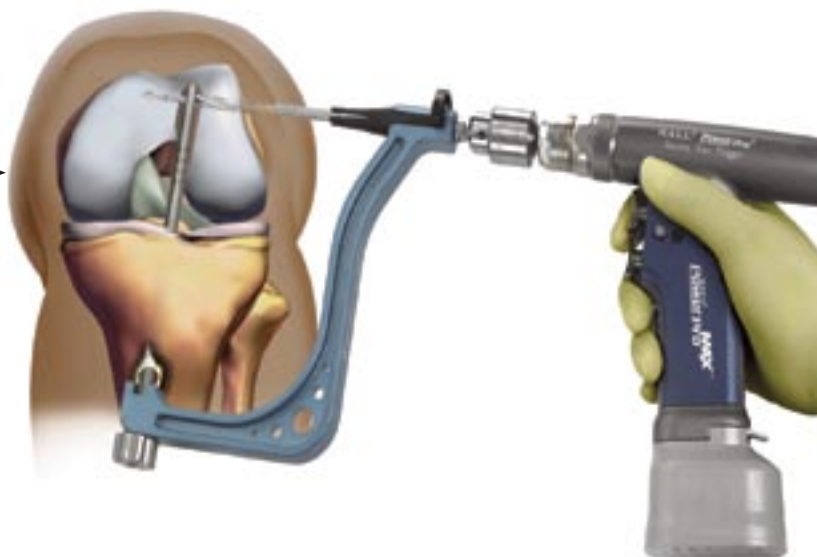
Cat. No.	Overall Length (X)	Distance from Lateral Femoral Cortex to Lateral Wall of Femoral Tunnel (Y)
CPP-4015	40mm	15mm Cortical Length
CPP-4520	45mm	20mm Cortical Length
CPP-5025	50mm	25mm Cortical Length

# CREATE TRANSVERSE TUNNEL

## STEP 6 — CROSSPIN IMPLANT SELECTION

After the measurement is taken, ensure the graft passing guide pin is removed and drill the the transverse tunnel until the drill bit stops against the U-Guide body.

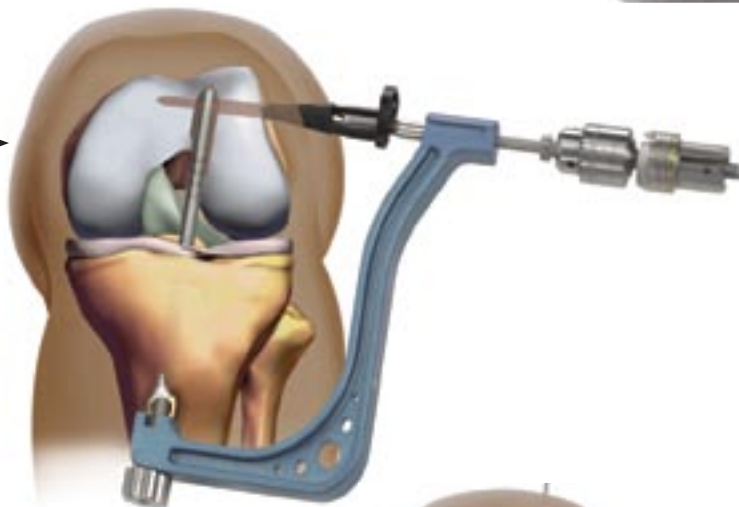
6



**6a.** Do not pull the drill from the tunnel using power. As the drill is pulled from the tunnel by hand, push the Transverse Cannula into the transverse tunnel.

**Note:** Transverse Cannula is designed to maintain the entrance location of the transverse tunnel, preventing fascia from covering the opening.

6a



**6b.** Return the graft passing guide pin to position, passing it drill tip first through the U-Guide assembly until it exits the lateral femur and skin. Remove the U-Guide from the knee by sliding it over the guide pin as it exits the femoral tunnel and tibial tunnel.

6b



# GRAFT PASSING

## STEP 7 — PASS THE GRAFT

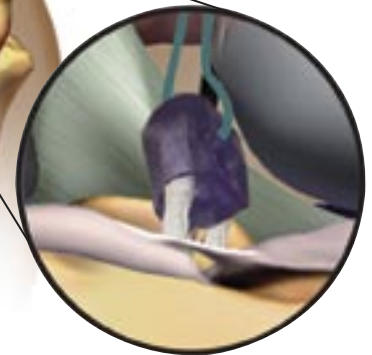
The hamstring graft construct (i.e., Graft Harness and graft bundle assembly) is drawn into the knee using the graft passing guide pin. Pass the lead suture on the Graft Harness through the eyelet of the graft passing guide pin and, while maintaining lateral to medial alignment of the axis of the eyelet in the Graft Harness, pass the graft construct into the tibial tunnel



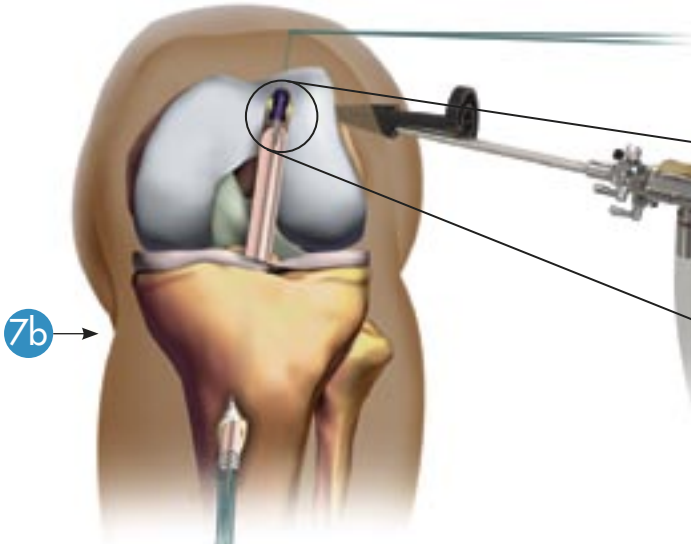
**7a.** As the Graft Harness enters the joint space in the intra-condylar notch, use an arthroscopic probe, if necessary, to maintain the eyelet orientation lateral to medial as it passes into the femoral tunnel. Pull firmly on the graft construct until it is fully seated in the femoral socket.



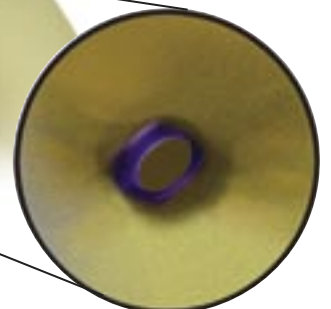
Camera view of Graft Harness orientation in the intra-condylar notch



**7b.** A sheathed scope can be placed into the Transverse Cannula to view the alignment of the axis of the Graft Harness eyelet with the axis of the transverse tunnel.



Camera view through transverse tunnel showing Graft Harness eyelet centered on transverse tunnel

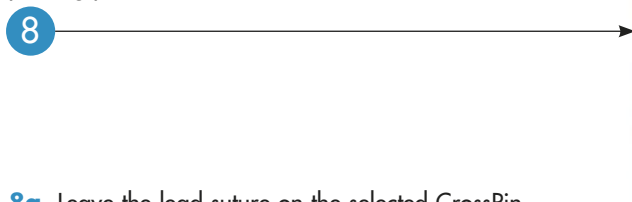


# FIXATION OF GRAFT

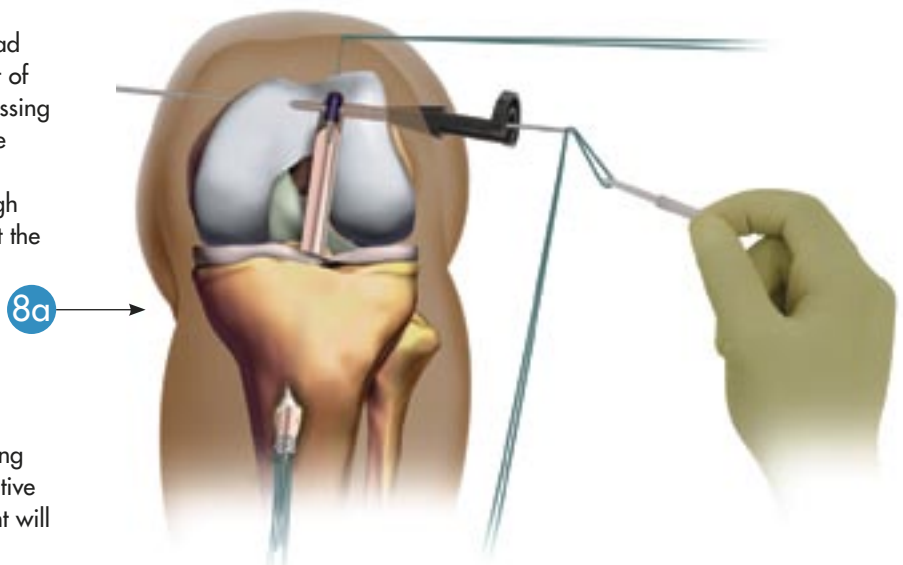
## STEP 8 — FIXATION OF GRAFT

Pass the graft passing guide pin through the Transverse Cannula and the eyelet of the Graft Harness into the medial portion of the transverse tunnel by hand. When the graft passing guide pin will advance no farther, drill the graft passing guide pin until it exits the medial femur and skin.

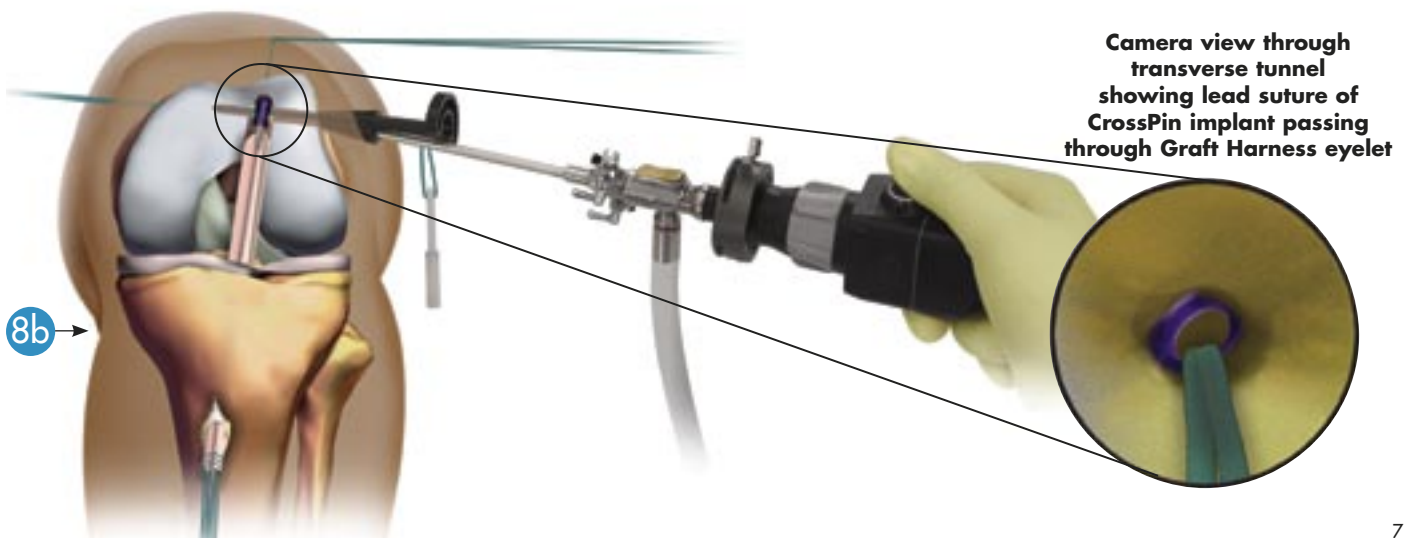
To confirm proper placement of the graft passing pin, pull tension on the graft construct to ensure the graft passing pin intersects the Graft Harness construct.



**8a.** Leave the lead suture on the selected CrossPin implant in place for use in the alignment of the implant during final femoral fixation. Pass the lead suture on the CrossPin implant through the eyelet of the graft passing guide pin. Remove the graft passing pin from the transverse tunnel by pulling from the medial side until it fully exits the knee. The lead suture of the CrossPin implant should pass through the transverse tunnel, the Graft Harness, and exit the medial side of the knee.



**8b.** A sheathed scope can be placed into the Transverse Cannula to view the lead suture passing through the eyelet of the Graft Harness as a positive confirmation that the path of the CrossPin implant will interface with the Graft Harness.

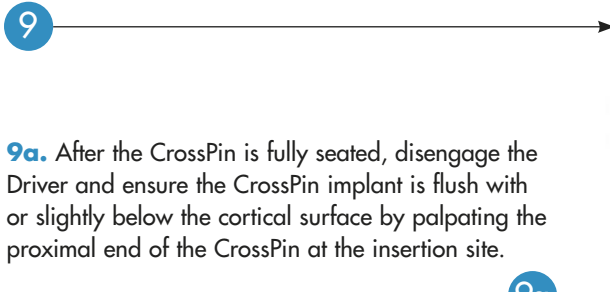




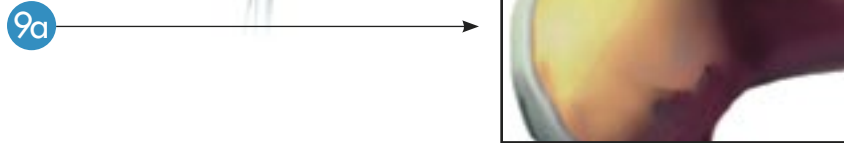
# FIXATION OF GRAFT

## STEP 9 — CROSSPIN FIXATION

Insert the CrossPin Driver into the proximal end of the implant and tap the driver with a mallet to move the implant through the Transverse Cannula and into the transverse tunnels. The lead suture of the CrossPin implant is pulled to remove any slack from the lead suture. As the CrossPin implant enters into the lateral transverse tunnel, continue to advance the implant with the Driver and a mallet while pulling out the Transverse Cannula. Continue advancing the CrossPin until it stops.



**9a.** After the CrossPin is fully seated, disengage the Driver and ensure the CrossPin implant is flush with or slightly below the cortical surface by palpating the proximal end of the CrossPin at the insertion site.



## STEP 10 — CYCLE THE KNEE

Apply tension to the graft construct at the point where it exits the tibial tunnel to check femoral fixation.

Pull on one end of the lead suture attached to the CrossPin to remove the suture from the CrossPin. Additionally, pull on one end of the lead suture attached to the Graft Harness to remove the suture from the Graft Harness.

Tensioning of graft can be conducted utilizing the ConMed Linvatec SE™ Graft Tensioner System

The recommended tibial fixation is the ConMed Linvatec BioScrew® Xtralok® interference screw.



# PINN-ACL® CROSSPIN SYSTEM

## PRODUCT FEATURES

### THE PINN-ACL CROSSPIN SYSTEM INSTRUMENTS AND IMPLANTS

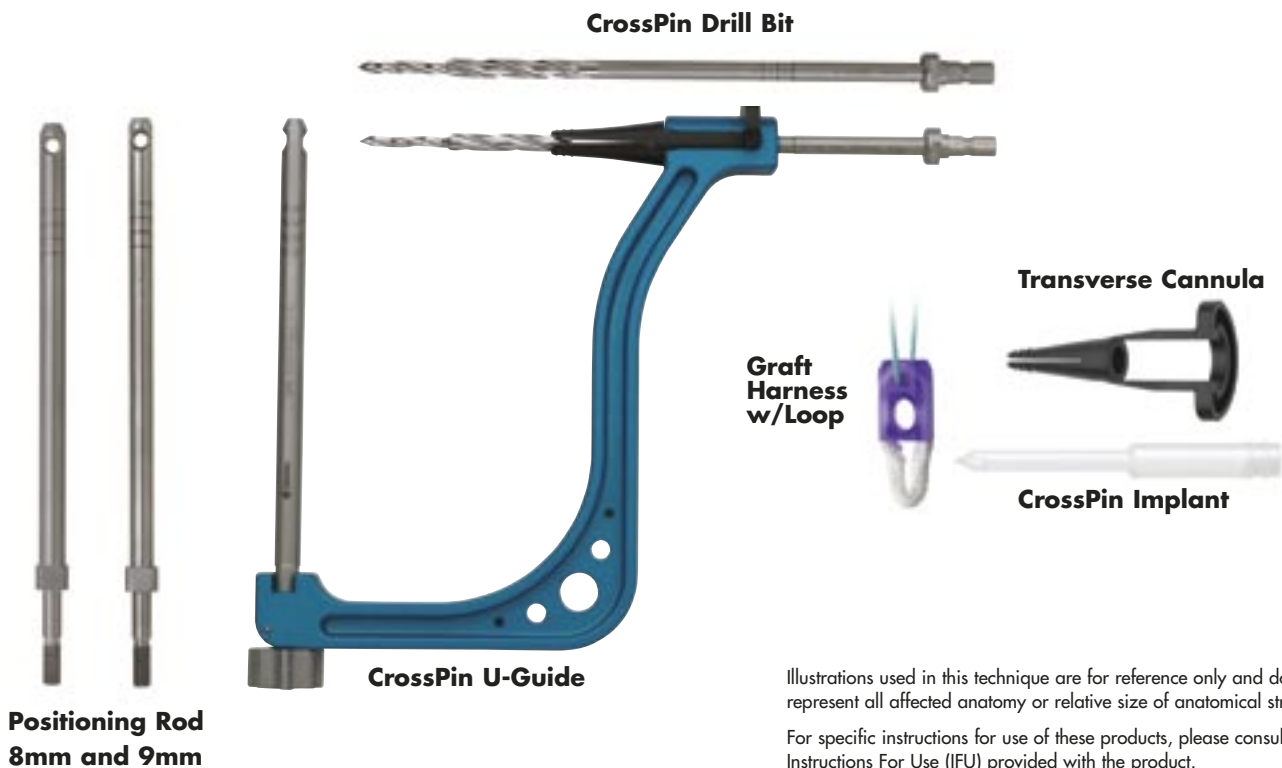
This system is designed for transverse femoral fixation of soft tissue grafts in ACL reconstruction, allowing for increased pull out strength. The ConMed Linvatec Pinn-ACL CrossPin System consists of a bioabsorbable Graft Harness implant and a Self-Reinforced™ CrossPin implant. The Graft Harness is composed of Poly L-Lactic Acid with a high strength polyethylene fiber loop, while the CrossPin implant is composed of Self-Reinforced PLLA. The Graft Harness and Pinn-ACL CrossPin implants are single-use and are supplied sterile.

The Pinn-ACL CrossPin System implants are the latest additions to ConMed Linvatec's line of bioabsorbable fixation products for ACL reconstruction, designed in conjunction with Linvatec Biomaterials Limited with innovation and improved clinical outcomes in mind.

#### Characteristics

- The Pinn-ACL CrossPin unique surgical technique offers the surgeon the ability to visualize the exact point of femoral fixation
- The Pinn-ACL CrossPin implant features the proprietary SELF-REINFORCED™ PLLA polymer providing the strongest bioabsorbable implant available
- CrossPin Lengths (Cortical Lengths CL) – 40mm (15mm CL), 45mm (20mm CL), 50mm (25mm CL)
- Graft Harness implant is composed of molded PLLA and a continuous loop of high strength polyethylene fiber used to secure the soft tissue graft
- Graft Harness Diameters – 8mm and 9mm
- Continuous loop of high strength polyethylene fiber reduces trauma to graft
- CrossPin absorption begins in vivo approximately 15 to 24 weeks, similar to other SR-PLLA implants
- The Pinn-ACL CrossPin System instruments have an innovative design with a built-in 3-point precision reference system
- Positioning rod/femoral tunnel diameters – 8mm and 9mm

**High strength polyethylene fiber in the Graft Harness continuous loop is manufactured with:**

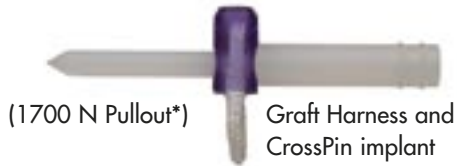


Illustrations used in this technique are for reference only and do not represent all affected anatomy or relative size of anatomical structure.

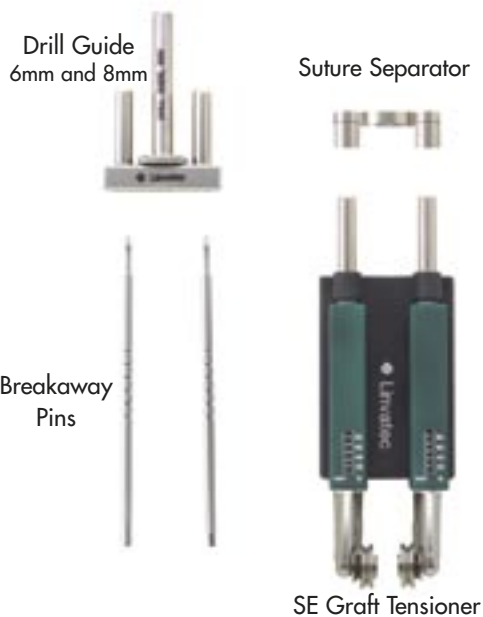
For specific instructions for use of these products, please consult the Instructions For Use (IFU) provided with the product.

# PINN-ACL® CROSSPIN SYSTEM

## Pinn-ACL CrossPin System



## SE™ Graft Tensioning System



## BioScrew® Xtralok®



## ORDERING INFORMATION

Description	Cat. No.
40mm (15mm) Self-Reinforced™ CrossPin, Sterile.....	CPP-4015
45mm (20mm) Self-Reinforced CrossPin, Sterile .....	CPP-4520
50mm (25mm) Self-Reinforced CrossPin, Sterile .....	CPP-5025
8mm Graft Harness and Transverse Cannula, Sterile .....	CPH-8000
9mm Graft Harness and Transverse Cannula, Sterile .....	CPH-9000
Pinn-ACL Sterilization Case.....	CPS-8901
CrossPin U-Guide.....	CPS-8902
CrossPin Drill Bit .....	CPS-8903
CrossPin Driver .....	CPS-8904
8mm Positioning Rod.....	CPS-8908
9mm Positioning Rod.....	CPS-8909
Harness Holder Accessory .....	PS8889
Graft Sizing Block .....	PS8832
SE Graft Tensioner .....	C9050
SE Graft Tensioner Drill Guide, 6mm .....	C9051
SE Graft Tensioner Drill Guide, 8mm .....	C9052
SE Graft Tensioner Suture Separator.....	C9053
SE Graft Tensioner Breakaway Pins with Graft Tension Calculator... (Box contains 5 sets. Set contains 2 pins and 1 calculator)	C9054
SE Graft Tensioner System Sterilization Tray .....	C9055
BioScrew Xtralok 8 mm x 35 mm .....	C8044
BioScrew Xtralok 9 mm x 35 mm .....	C8027
BioScrew Xtralok 10 mm x 35 mm .....	C8028
BioScrew Xtralok 11 mm x 35 mm .....	C8029
BioScrew Xtralok 8 mm x 40 mm .....	C8043
BioScrew Xtralok 9 mm x 40 mm .....	C8040
BioScrew Xtralok 10 mm x 40 mm .....	C8041
BioScrew Xtralok 11 mm x 40 mm .....	C8042
BioScrew Universal Driver, Modular .....	C8716
Ratcheting Handle.....	D8640
ACL Disposable Kit.....	8800

\*Data on file. Caborn, David N.M. MD, "Biomechanical Comparison of the Bioabsorbable RetroScrew System, BioScrew Xtralok With Stress Equalization Tensioner, and 35mm Delta Screws for Tibialis Anterior Graft-tibial Tunnel Fixation in Porcine Tibiae." *American Journal of Sports Medicine*, Vol. 33, Number 7 (July 2005): 1057 - 1063.

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11311 Concept Boulevard  
Largo, FL 33773-4908  
(727) 392-6464  
Customer Service: 1-800-237-0169  
FAX: (727) 399-5256  
International FAX: +1 (727) 397-4540  
email: customer\_service@linvatec.com  
www.linvatec.com