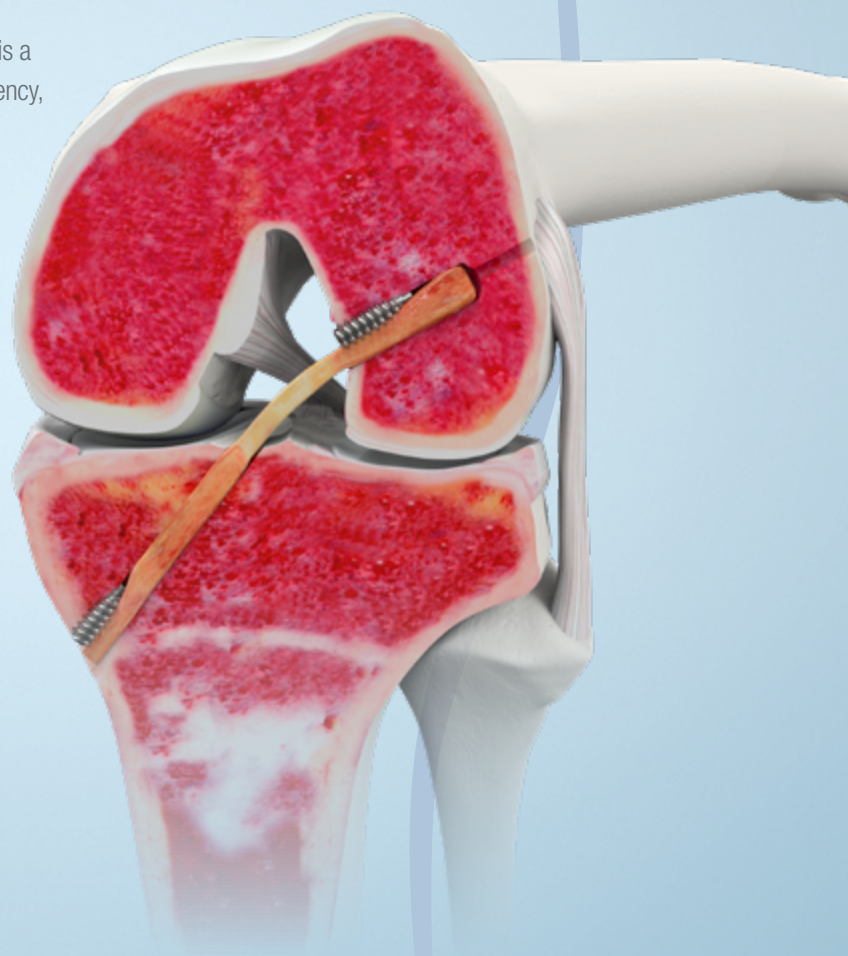




## Anatomic ACL Reconstruction with a Bone-Patellar Tendon-Bone (BPTB) Graft Using the Infinity™ Knee System

Revolutionizing reconstructions, CONMED's modular knee system is a complete platform designed to provide versatility, procedural efficiency, and an easier day in the OR.



### Technique featured by

Tim Spalding, FRCS Orth  
University Hospitals Coventry Warwickshire NHS Trust,  
UK Honorary Associate Professor, Warwick Medical School,  
University of Warwick

In Partnership with:  
**mtf**biologics

**CONMED  
SURGICAL  
TECHNIQUE**



# Anatomic ACL Reconstruction with a Bone-Patellar Tendon-Bone (BPTB) Graft

## Using the Infinity™ Knee System



Introduction by Tim Spalding, FRCS Orth

*ACL Reconstruction using a bone-patellar tendon-bone (BPTB) graft has become increasingly popular especially among the younger, active patient population.*

BPTB grafts are often harvested from the patient's central third of the patella tendon, or a surgeon may prefer a BPTB allograft from a donor. Benefits of BPTB grafts include faster healing rates from bone to bone integration, and aperture fixation of the graft against the bone tunnels.<sup>1,2</sup>

CONMED partnered with a team of the world's most renowned knee surgeons to create the CONMED Knee Surgeon Design Team and develop products that overcome the challenges surgeons face in the OR every day.

The result is the Infinity™ Knee System, a complete system designed to provide versatility, procedural efficiency, and an easier day in the OR. ■



CONMED Provides High-Quality Tissue in Partnership with MTF Biologics

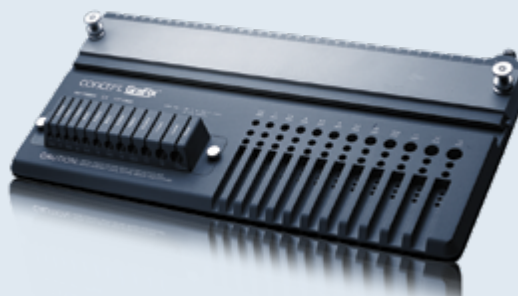
*MTF Biologics has some of the most stringent donor selection criteria of any tissue bank in the world, helping ensure tissue of the highest quality.*

**CONMED  
SURGICAL  
TECHNIQUE**

<sup>1</sup> CD Papageorgiou, et al. A Multidisciplinary Study of the Healing of an Intraarticular Anterior Cruciate Ligament Graft in a Goat Model. *AJSM*. 2001;29(5):620-6. doi: 10.1177/03635465010290051501. <sup>2</sup> Xiaobo Xie, et al. A Meta-Analysis of Bone-Patellar Tendon-Bone Autograft Versus Four-Strand Hamstring Tendon Autograft for Anterior Cruciate Ligament Reconstruction. *Knee*. 2015;22(2):100-110.

## BONE-PATELLAR TENDON-BONE (BPTB) GRAFT PREPARATION

- 1** **Expose the patella tendon** allowing for harvest of the bone block from the patella and the tibial tubercle. Longitudinal or transverse incisions can be used.
- 2** **Using the Hall® MicroFree® Sagittal Saw**, excise the middle third of the patella bone harvesting a bone block approximately 20mm in length and 10mm in width.  
**TIP:** Creating cuts at 45° toward the midline of the patella bone reduces the amount of bone removal and simplifies harvesting.  
**Avoid extension of the sawblade across the patella to reduce the risk of patella fracture.**
- 3** **Repeat steps** for bone harvesting on the tibial tubercle.
- 4** **Trim the femoral bone block** to a length no greater than 20mm to allow for easier graft passage. Trim the diameter of the bone block and graft to the appropriate tunnel diameter, typically 10mm.
- 5** **Use the GraFix® Graft Preparation Table** with bone block sizing templates. Drill two holes in both the femoral and tibial bone block to load passing sutures.
- 6** **Remove and preserve the cancellous bone** from tibial tubercle using a small osteotome and curette, and the bone trimmed from the bone blocks, for later use to fill the patella bone defect.

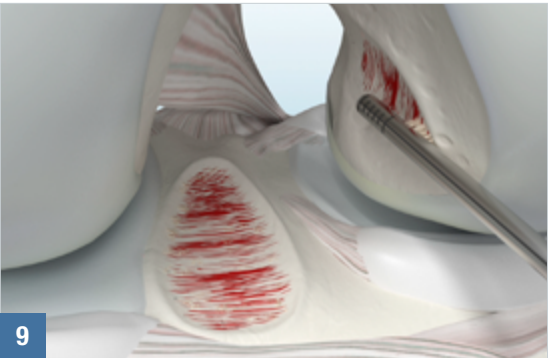


**GRAFIX®** GRAFT  
PREPARATION TABLE

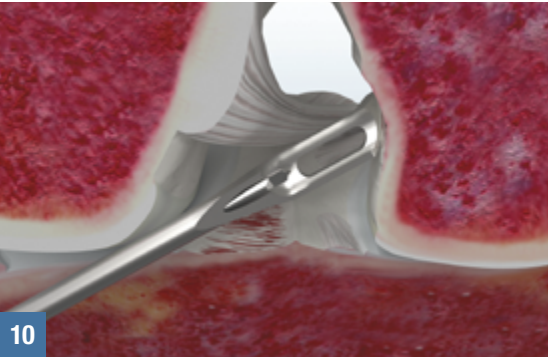
## PORTAL PLACEMENT

- 7** **Lateral Portal:** Create a standard lateral working portal.
- 8** **Medial Portal:** If using the Infinity™ Anteromedial Guide, a lower medial portal is required. This can be used for all medial access or can be created as an accessory portal using a higher medial portal next to the patella tendon for knee preparation and viewing of the femoral ACL anatomy.  
**NOTE:** Care should be taken when preparing the medial portal to allow enough room for a 10-11mm drill to be inserted without damage to the medial femoral condyle's articular surface while the leg is positioned in deep flexion. ■

FEMORAL TUNNEL PREPARATION AND DRILLING



Debride remnant tissue and prepare the femoral ACL's femoral footprint.



Front load the Infinity™ Spade Tip Guide Pin (3.5mm) onto the appropriately oriented and sized Infinity™ Anteromedial Guide. Pass the Guide through the anteromedial portal, appropriately widened to accommodate the guide and later drill.

**NOTE:** Standard 2.4mm Graft Passing Pin can be used if preferred.

**NOTE:** The Infinity™ Anteromedial Guide's offset preserves the backwall while the semi-bullseye tip allows for visualization of the tunnel footprint. DO NOT use the device's offset to leverage or pry against bone.

**TIP:** The outer diameter of the semi-bullseye represents the diameter of the larger of the two sizes associated with the guide.

Infinity™ Anteromedial Guides Offset Reference Chart			
Desired Tunnel Diameter	Recommended Guide	Offset from Backwall	Semi-Bullseye Diameter Reference
11mm	Infinity™ Anteromedial Guide (9/10, 7mm Offset)	1.5mm	Outer Diameter: 10.0mm
10mm	Infinity™ Anteromedial Guide (9/10, 7mm Offset)	2.0mm	Outer Diameter: 10.0mm
9mm	Infinity™ Anteromedial Guide (9/10, 7mm Offset)	2.5mm	Outer Diameter: 10.0mm

**NOTE:** If not using the Infinity™ Anteromedial Guide, the preferred tunnel position can be marked with the Edge® Radiofrequency System or awl and used to guide the Infinity™ Spade Tip Guide Pin into place.



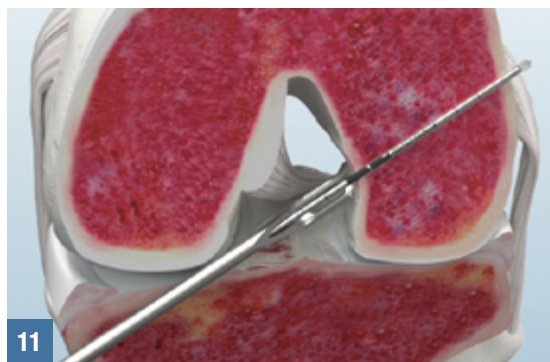
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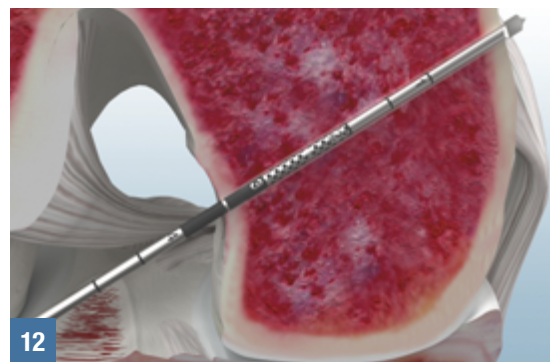
## FEMORAL TUNNEL PREPARATION AND DRILLING



Anatomic **ACL Reconstruction** with a Bone-Patellar Tendon-Bone (BPTB) Graft Using the Infinity™ Knee System



Using the Hall® MicroFree® Mini-Driver with the Pin Driver attachment, place the leg in hyperflexion and advance the Infinity™ Spade Tip Guide Pin to the outside of the lateral femoral condyle.

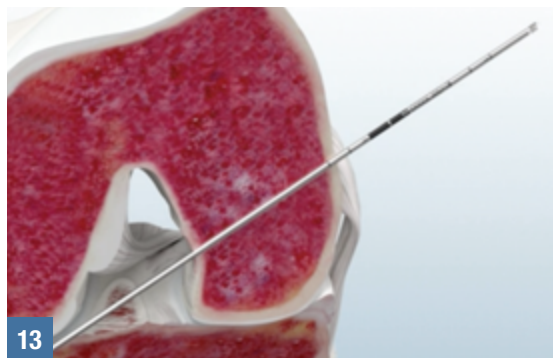


After the Infinity™ Spade Tip Guide Pin has advanced through the condyle, but before advancing the pin through skin, pull back on the Guide Pin to read the femoral aperture-to-cortex length.



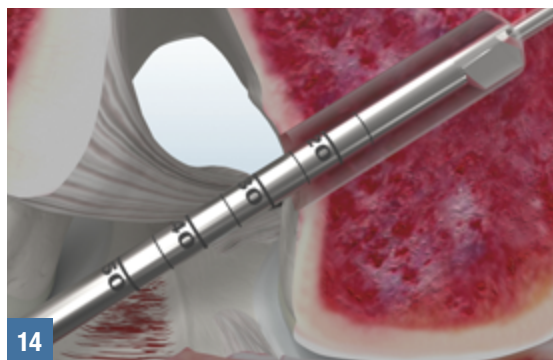
HALL® MICROFREE®  
MINI-DRIVER

## FEMORAL TUNNEL PREPARATION AND DRILLING



After confirming the femoral aperture-to-cortex length, advance the Infinity™ Spade Tip Guide Pin to the skin.

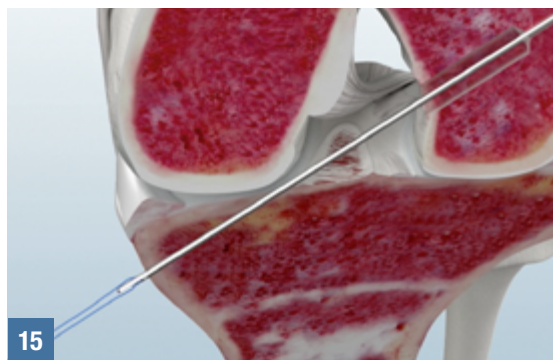
Make a small stab incision to allow atraumatic passage of the Guide Pin through the skin.



**Ream the femoral graft tunnel** to match the length of the femoral bone plug of the BPTB graft (usually 20mm), using a low-profile Sentinel® Reamer.

### NOTE:

Minimal tunnel and bone block length is recommended to be 15mm.

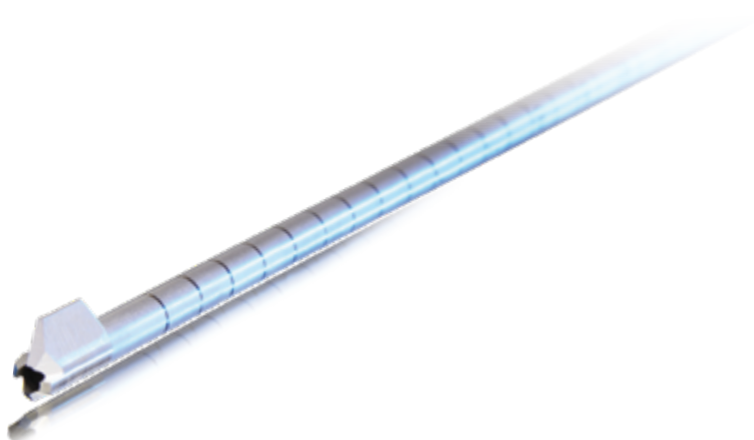


**Load the tails of a passing suture** through the distal eyelet of the Guide Pin.

Retrieve the tails to the outside of the lateral femoral condyle, maintaining the loop outside of the anteromedial portal.

Bring the knee back to 90° and remove debris from the joint, inspecting the tunnel position. ■

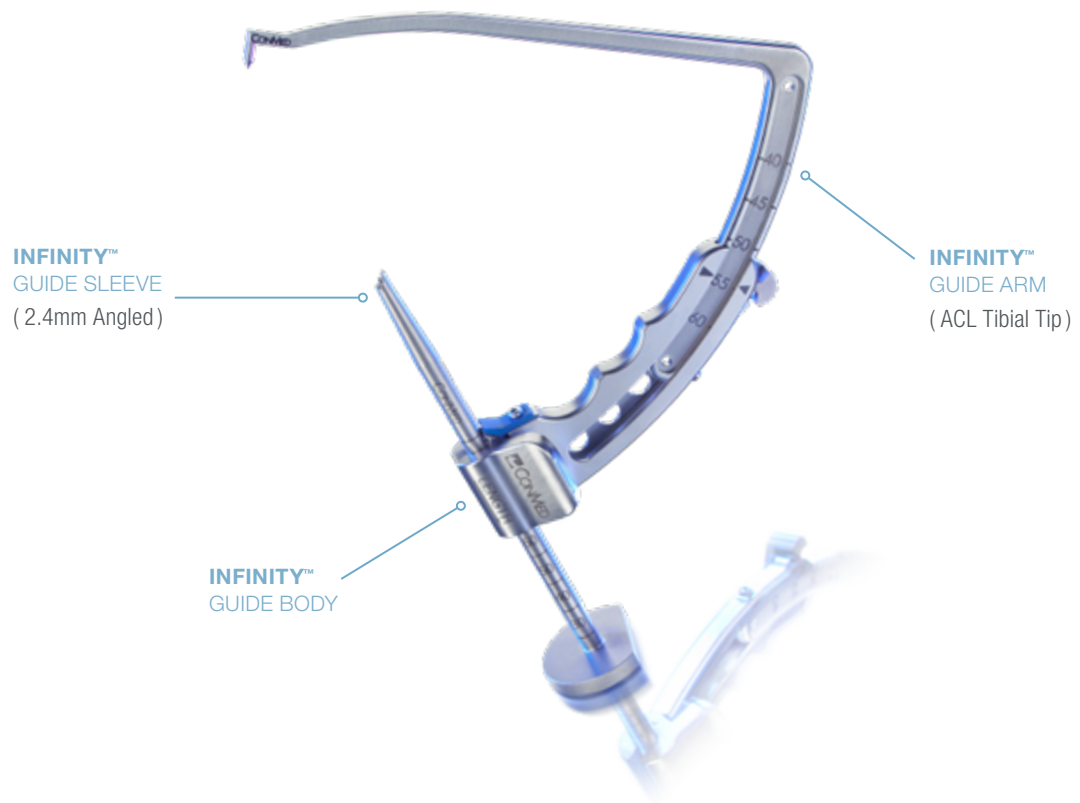
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## TIBIAL TUNNEL PREPARATION AND DRILLING

Anatomic **ACL Reconstruction** with a Bone-Patellar Tendon-Bone (BPTB) Graft  
Using the Infinity™ Knee System



- 16 Assemble the Infinity™ Modular Guide System** using the Infinity™ ACL Tibial Elbow or Tip Guide Arm and the 2.4mm Angled or Straight Guide Sleeve.

**NOTE:**

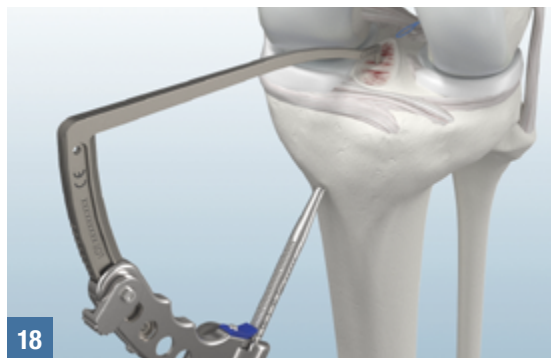
Set the angle of the Guide System to the appropriate angle according to surgeon preference. To determine this angle, the  $N+7\text{mm}$  rule can be used, where N is the graft tendon length between the bone blocks.

**Special precautions are required when the total length of the BPTB construct is greater than 100mm.**

- 17 Introduce the Guide Arm** through the anteromedial portal and locate the tibial ACL footprint. ■



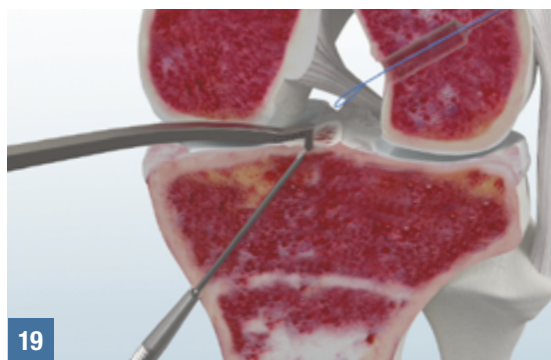
## TIBIAL TUNNEL PREPARATION AND DRILLING



Once positioned, advance the Guide Sleeve to skin with the ratchet mode disengaged. Make an incision and continue to advance the Guide Sleeve's tip against bone. Rotate the Guide Sleeve so the ratchet function is engaged and advance against bone using 2-3 ratchet clicks.

**NOTE:**

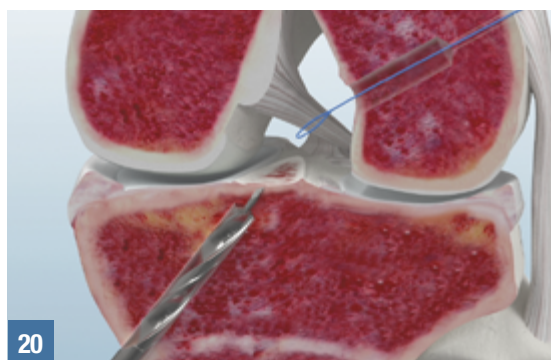
Do not over tension/ratchet the Guide Sleeve against bone as this could impact tunnel trajectory.



Under direct visualization, advance a 2.4mm guide pin, through the tibia until the pin tip is exposed within the joint. Remove the Guide System from the field.

**NOTE:**

Avoidance of roof or sidewall impingement can be checked according to surgeon preference by bringing the knee into extension with the guide pin in place, or visualizing the notch through the tunnel with the arthroscope, with the knee in hyperextension.



Under direct visualization, advance a Constant Diameter Reamer until the reamer tip is exposed within the joint.

**NOTE:**

When preparing the bony ends of the BPTB graft, the ends should be chamfered, and the diameter of the bone block confirmed to be 0.5mm less than the tunnel to ensure easy passage of the graft.

Remove any bony and/or soft tissue remnants around the aperture of the tunnel that may impede graft passage. ■



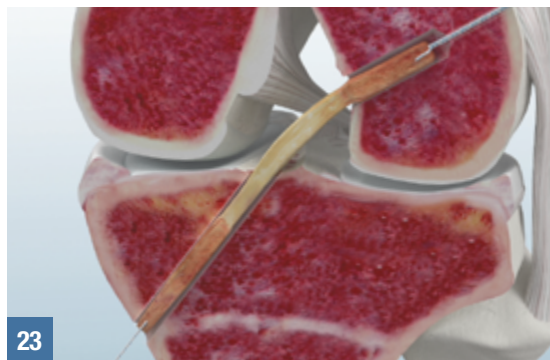
CONSTANT DIAMETER  
REAMERS

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## GRAFT POSITIONING AND FIXATION

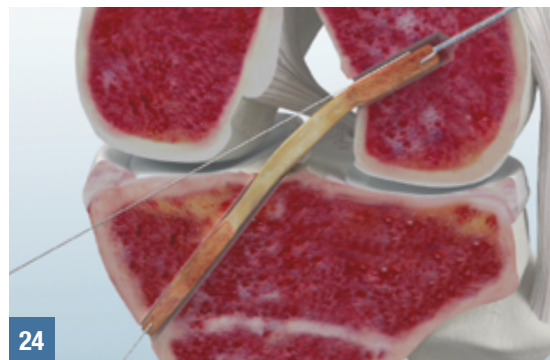
### Anatomic **ACL Reconstruction** with a Bone-Patellar Tendon-Bone (BPTB) Graft Using the Infinity™ Knee System

- 21** Retrieve the **femoral passing suture** through tibial tunnel and load the superior passing sutures of the BPTB graft onto the passing suture.
- 22** Pull the **passing sutures through the knee** and retrieve outside of the lateral femoral cortex.



**Advance the graft up the tibial tunnel** and into the femoral tunnel with the assistance of an arthroscopic probe until the bone block is flush with the femoral aperture.

The bone block should be rotated such that the bone part is facing toward the arthroscope.



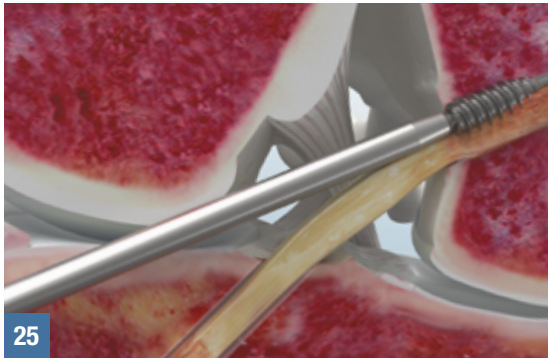
**Insert a HyperFlex Guidewire** through the anteromedial portal and position between the bone block and the wall of the femoral tunnel. Place the knee in full flexion.

#### ALLOGRAFT TENDONS WITH BONE BLOCK



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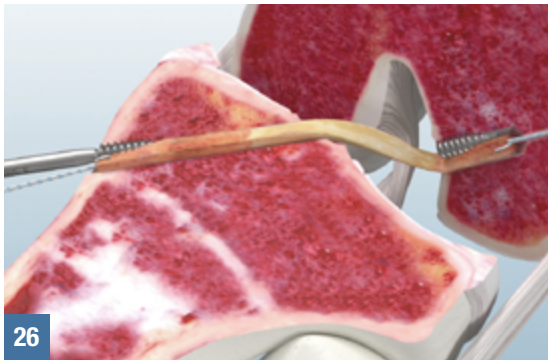
## GRAFT POSITIONING AND FIXATION



Load the EZStart™ Interference Screw onto a 3.5mm Hex Driver and insert over the guidewire. Using the EZStart's conical tip to self-notch and tap, advance the screw into place until the threads are slightly recessed into the tunnel.

### NOTE:

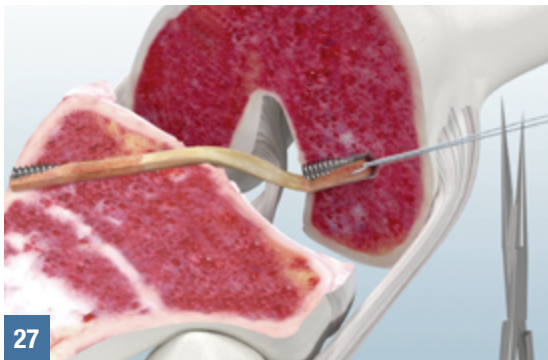
No tapping is required with this screw as the threads engage in the bone with rapid advancement. For stable bone, it is recommended to downsize the screw size compared to the tunnel diameter by 2mm (i.e. an 8mm screw in a 10mm tunnel). For soft bone it is recommended to downsize by 1mm (i.e. a 9mm screw in a 10mm tunnel).



After cycling the knee and inspecting graft movement to ensure no impingement, fix the tibial end of the graft. Apply tension to the tibial bone block sutures with the knee in full extension and fixate with a second EZStart™ Interference Screw.

### NOTE:

To avoid any tendency to advance the bone plug inadvertently, place a hemostat on the sutures next to the bone plug so it is easy to visualize any movement of the bone block.

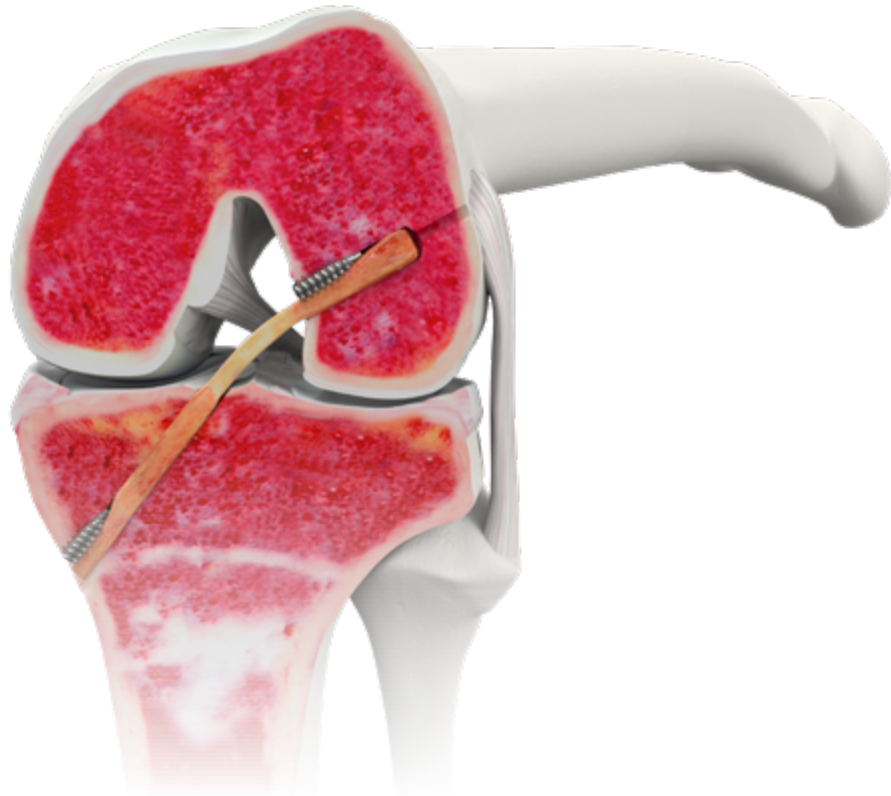


Finally, remove the passing sutures to close and complete the ACL reconstruction. ■

**EZSTART™**  
INTERFERENCE SCREW



**CONMED  
SURGICAL  
TECHNIQUE**



*Imagine What We Could Do Together*

## TIM SPALDING, FRCS ORTH\*

*University Hospitals Coventry Warwickshire NHS Trust,  
UK Honorary Associate Professor, Warwick Medical School,  
University of Warwick.*

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**Tim Spalding, FRCS** is a Consultant Orthopedic Surgeon based at the University Hospitals Coventry Warwickshire NHS Trust.

He completed a fellowship in knee and sports surgery in Toronto, Canada in 1995 and has been specializing in knee surgery since that time.

Mr. Spalding's interests cover the range of knee surgery including arthroscopic anterior and posterior cruciate ligament reconstruction, osteotomy, articular cartilage repair, and meniscal surgery including repair and meniscal allograft transplantation.

He is actively involved with research and teaching both nationally, and internationally.

Most recently he is one of the lead developers of the UK National Ligament Registry dedicated to analyzing and improving the outcome of Anterior Cruciate ligament reconstruction.



- **Mr. Spalding is President of the ACL Study Group and co-chair of the European Allograft Initiative studying and promoting the place of allografts in joint reconstruction.**

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\* Mr. Tim Spalding is a paid CONMED consultant.



## ORDERING INFORMATION

### EZSTART™ INTERFERENCE SCREW (TITANIUM)

7.0mm x 15mm .....	EZ0715T
7.0mm x 20mm .....	EZ0720T
7.0mm x 25mm .....	EZ0725T
7.0mm x 30mm .....	EZ0730T
8.0mm x 15mm .....	EZ0815T
8.0mm x 20mm .....	EZ0820T
8.0mm x 25mm .....	EZ0825T
8.0mm x 30mm .....	EZ0830T
9.0mm x 15mm .....	EZ0915T
9.0mm x 20mm .....	EZ0920T
9.0mm x 25mm .....	EZ0925T
9.0mm x 30mm .....	EZ0930T
10.0mm x 15mm .....	EZ1015T
10.0mm x 20mm .....	EZ1020T
10.0mm x 25mm .....	EZ1025T
10.0mm x 30mm .....	EZ1030T

*Additional EZStart™ Interference Screw sizes are available.*

### BIOCOMPOSITE GENESYS™ MATRYX® INTERFERENCE SCREWS

7.0mm x 20mm .....	237020M5
7.0mm x 25mm .....	237025M5
7.0mm x 30mm .....	237030M5
8.0mm x 20mm .....	238020M5
8.0mm x 25mm .....	238025M5
8.0mm x 30mm .....	238030M5
8.0mm x 35mm .....	238035M5
9.0mm x 20mm .....	239020M5
9.0mm x 25mm .....	239025M5
9.0mm x 30mm .....	239030M5
9.0mm x 35mm .....	239035M5
10.0mm x 20mm .....	231020M5
10.0mm x 25mm .....	231025M5
10.0mm x 30mm .....	231030M5
10.0mm x 35mm .....	231035M5

*Additional Biocomposite GENESYS™ Matryx® Interference Screw sizes are available.*

### EZSTART™ INTERFERENCE SCREW INSTRUMENTATION

Modular Driver Attachment, Straight, 3.5mm Hex .....	D8652
Racheting Handle .....	D8653
Hyperflex Guide Wire, 14" x 0.062" dia. ....	D8651
Optional Graft Protector, 7.0mm .....	DFS70
Optional Graft Protector, 8.0/9.0mm .....	DMS70

*Additional EZStart™ Interference Screw instrumentation is available.*

To order any of the Infinity™ Knee System products, Interference Screws, Instrumentation, and Accessories, please call CONMED Customer Service at: (US) **1-866-4CONMED** or (Global) **727-214-3000**.

For additional information on the Infinity™ Knee System and other CONMED products, please visit: **[www.CONMED.com/Infinity](http://www.CONMED.com/Infinity)**

### GENESYS™ MATRYX® INTERFERENCE SCREW INSTRUMENTATION

Tri-Lobe Driver, 7.0-11.0mm, Fixed .....	DFS70
Tri-Lobe Driver, 7.0-11.0mm, Short Modular .....	DMS70
Tri-Lobe Driver, 7.0-11.0mm, Extended Length Modular .....	C8716
Twist Drill w/Stop, 2mm .....	8733
Tap, 7.0-8.0mm, Fixed .....	TFS70
Tap, 7.0-8.0mm, Short Modular .....	TMS70
Tap, 7.0-8.0mm, Extended Length Modular .....	D8607
Tap, 9.0-10.0mm, Fixed .....	TFS90
Tap, 9.0-10.0mm, Short Modular .....	TMS90
Tap, 9.0-10.0mm, Extended Length Modular .....	D8609
Universal Driver, Modular Ratcheting Handle .....	D8640
Hyperflex Guide Wire, 14" x 0.045" dia. ....	C8006
For use with 7mm-11mm screws	

*Additional GENESYS™ Matryx® Interference Screw Instrumentation is available.*

## ORDERING INFORMATION

### CONSTANT DIAMETER REAMERS (FOR TIBIAL REAMING)

5.0mm Reamer .....	CD050
5.5mm Reamer .....	CD055
6.0mm Reamer .....	CD060
6.5mm Reamer .....	CD065
7.0mm Reamer .....	CD070
7.5mm Reamer .....	CD075
8.0mm Reamer .....	CD080
8.5mm Reamer .....	CD085
9.0mm Reamer .....	CD090
9.5mm Reamer .....	CD095
10.0mm Reamer .....	CD100
11.0mm Reamer .....	CD110
12.0mm Reamer .....	CD120-1
13.0mm Reamer .....	CD130

### SENTINEL® DRILL BITS (FOR FEMORAL REAMING)

8.0mm Reamer .....	S8580
8.5mm Reamer .....	S8585
9.0mm Reamer .....	S8590
9.5mm Reamer .....	S8595
10.0mm Reamer .....	S8510
10.5mm Reamer .....	S85105
11.0mm Reamer .....	S8511

*Additional Sentinel® Drill Bit sizes are available.*

### INFINITY™ GUIDE ARMS, GUIDE SLEEVES AND GUIDE BODY

Infinity™ ACL Tibial Tip Guide Arm .....	KTT100
Infinity™ ACL Tibial Elbow Guide Arm .....	KTE100
Infinity™ ACL Tibial Footprint Guide Arm .....	KTA100
Infinity™ Guide Sleeve, Straight .....	KTS124
Infinity™ Guide Sleeve, Angled .....	KTS224
Infinity™ Guide Body .....	KGB100

### INFINITY™ ANTEROMEDIAL GUIDES

Infinity™ Anteromedial Guide, Left, 7.0/8.0mm .....	KBL178
Infinity™ Anteromedial Guide, Left, 9.0/10.0mm .....	KBL191
Infinity™ Anteromedial Guide, Right, 7.0/8.0mm .....	KBR178
Infinity™ Anteromedial Guide, Left, 9.0/10.0mm .....	KBR191

### INFINITY™ ACCESSORIES AND OTHER INSTRUMENTATION

Infinity™ Tunnel Dilator, 3.5mm .....	KFD035
Infinity™ Spade Tip Guide Pin, 3.5mm .....	KGP035
Anatomic ACL Disposable Kit .....	8820
#2 Hi-Fi Suture, 12/Box, Two 40" Strands, Blue and White-Black Co-braid, No Needle .....	H6200
Suture Handle .....	HDL-CLT
EL Depth Probe .....	21.1001EL
Bullseye® Femoral Footpring Ruler .....	RL1000

### GRAFT PREPARATION SYSTEM

Graft Preparation Table .....	PS8820
Slide Lock (2 Recommended) .....	PS8821
Bone Tendon Bone Clamp .....	PS8826
Suture Holder Clamp .....	PS8823
Tension Clamp .....	PS8824
Scraping Board .....	PS8830
Bone Block Drill Guide .....	PS8829
Graft Sizing Block .....	PS8832
2mm Twist Drill with Stop .....	8733

To order Allograft Tissue please call MTF Customer Service at: (US) **800-433-6576** or (Global) **732-661-0202**.

#### ALLOGRAFT TENDON w/Bone Blocks      FREEZE-DRIED      FROZEN

Bone-Tendon-Bone Hemi w/Quadriceps, 10.0-12.0mm Width .....	400005	....	430005
Bone-Tendon-Bone Hemi w/Quadriceps, 10.0-13.0mm Width w/specs .....	-	....	430012
Bone-Tendon-Bone Hemi w/10.0mm Shaped Bone-Block .....	400007	....	430007
Bone-Tendon-Bone Hemi w/Quadriceps, ≥ 13.0mm Width .....	400010	....	430010
Bone-Tendon-Bone Hemi w/Quadriceps, ≥ 13.0mm Width w/specs .....	-	....	430014
Bone-Tendon-Bone Hemi w/o Quadriceps .....	-	....	430015
Bone-Tendon-Bone Whole w/5.0cm Quadriceps ...	-	....	430034
Bone-Tendon-Bone Whole w/5.0cm Quadriceps ... w/specs	-	....	430032
Bone-Tendon-Bone Whole w/8.0cm Quadriceps ...	-	....	430036

#### ALLOGRAFT TENDON w/Bone Blocks      FREEZE-DRIED      FROZEN

Achilles Tendon w/Calcaneus, ≥ 19.5cm Length .....	400203	....	430200
Achilles Tendon w/Calcaneus, w/specs .....	-	....	430201
Achilles Tendon w/10.0mm Shaped Bone-Block, ≥ 19.5cm Length .....	-	....	430207
Achilles Tendon w/10.0mm Shaped Bone-Block, w/specs .....	-	....	430208
Achilles Tendon w/Calcaneus, 16.0-19.5cm Length ...	400278	....	430250
Achilles Tendon w/o Calcaneus, 16.0-19.5cm Length ..	400279	....	430521
Quadriceps Tendon w/Bone Block, ≥ 16.0cm Length ..	-	....	430700
Quadriceps Tendon w/o Bone Block .....	-	....	430705
Quadriceps Tendon w/10.0mm Shaped Bone-Block, ≥ 14.0cm Length .....	-	....	430707



# Anatomic ACL Reconstruction

## with a Bone-Patellar Tendon-Bone (BPTB) Graft

CONMED Corporation  
11311 Concept Blvd.  
Largo, Florida 33773

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International: 727-214-3000

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This material provides information regarding how to use CONMED medical devices and instruments in surgical procedures. It is not medical advice and each surgeon should use their own professional judgment before using to treat a particular patient. Surgeons should be trained in the use of such devices before surgery and should always refer to the product labeling including the Instructions for Use before using any medical device.

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