



## Curved Anatomic Soft Tissue ACL Reconstruction

Using GraftMax™ Curved Reaming,  
GraftMax™ Button and GENESYS™ Matryx®

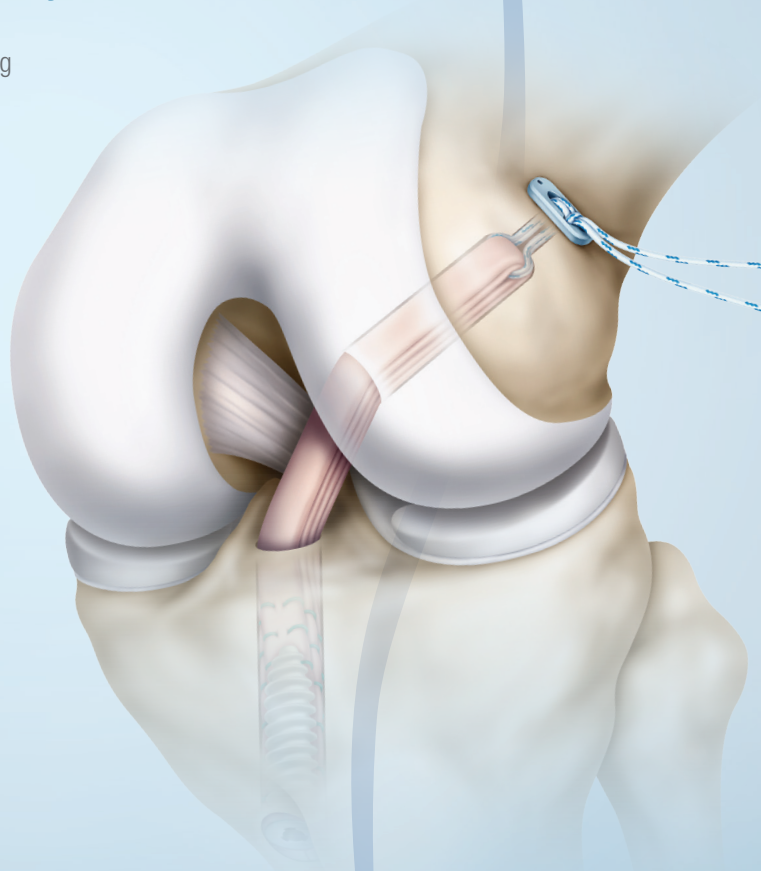
A complete guide to ACL Repair utilizing GraftMax™ Curved Reaming System and GraftMax™ Button ALB. As the newest addition to CONMED's Knee Preservation System, the GraftMax™ System facilitates secure, precise anatomic ACL reconstruction with maximum graft fill.



### Technique featured by

Brian R. Wolf, MD, MS  
University of Iowa, Sports Medicine – USA

In partnership with



CONMED  
SURGICAL  
TECHNIQUE

## Curved Anatomic Soft Tissue ACL Reconstruction

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Introduction by Brian R. Wolf, MD, MS

*The ultimate goal of ACL reconstruction is to replicate the form and function of the native ACL. Anatomic ACL reconstruction is facilitated by tibia-independent femoral tunnel drilling.*

Curved instrumentation facilitates anatomic tunnel placement by reducing the need to hyperflex the knee when using a medial portal femoral drilling technique.

Curved instrumentation and flexible reaming are also less technically demanding and can enhance tunnel accuracy in replicating the native ACL anatomy. Flexible reaming instruments also help avoid potential damage to the medial femoral condyle articular cartilage facilitating a safer procedure.

The GraftMax™ Button fixation system partners well with the goal of anatomic ACL reconstruction. Anatomic femoral tunnel positioning can result in shorter femoral tunnels. The adjustable length loop of the GraftMax™ Button allows maximal utilization of femoral tunnel depth with excellent biomechanical fixation. ■

### BRIAN R. WOLF, MD, MS

Vice-Chairman of Orthopaedic Surgery, Director of Sports Medicine,  
Director of Orthopaedic Sports Medicine Fellowship,  
University of Iowa – USA



**Brian R. Wolf, MD, MS** is the Ralph and Marcia Congdon Endowed Professor and Vice-Chairman in the University Of Iowa Department Of Orthopaedic Surgery. Dr. Wolf also serves as the Director of Sports Medicine and Director of the Orthopaedic Sports Medicine fellowship at the University of Iowa.

Clinically, Dr. Wolf's interests include sports medicine and disorders of the knee, shoulder, and elbow. His areas of surgical interest include rotator cuff repair, shoulder instability surgery, ACL and knee ligament injuries, cartilage restoration, elbow arthroscopy and ligament repair among others.

He is very active in providing care for athletes and is the Head Team Physician for the University of Iowa football, basketball, baseball, tennis and swimming teams. Dr. Wolf has a passion for evidence-based research and his interests center on clinical outcome studies. He has been an NIH K30 and K12 scholar in patient oriented research.

Much of Dr. Wolf's current research comes from multi-center prospective collaborative research. He is a long time member of the NIH funded Multi-center Orthopaedic Outcomes Network (MOON) research group which has established prospective multi-center cohort studies to analyze outcomes following ACL reconstruction, shoulder stabilization and rotator cuff tear.

**Dr. Wolf has over 100 peer-reviewed publications, many of which focus on ACL anatomy, reconstruction tunnel placement and predictors of outcomes.**

Academically, Dr. Wolf is a Fellow of the AAOS and a member of AOSSM and AANA. His honors include being elected into the AOA, the Herodicus Society, the American Shoulder and Elbow Society and the Association of Bone and Joint Surgeons. Dr. Wolf has twice been awarded the Neer Award for shoulder research, and he has been a part of research that earned the AOSSM O'Donohue Award and the Herodicus Award. He was a traveling fellow for the AOSSM exchange with Europe in 2010. He was selected for the esteemed AOA American British Canadian Traveling Fellowship in 2013.

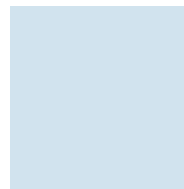
**Dr. Wolf has been listed in U.S. News "Best Doctors in America" since 2007.**

# Curved Anatomic Soft Tissue ACL Reconstruction

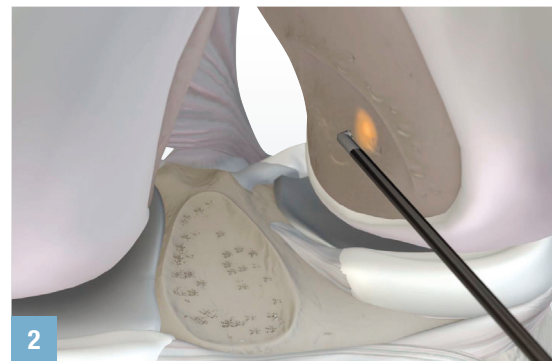
Using GraftMax™ Curved Reaming, GraftMax™ Button and GENESYS™ Matryx®

Authored by Brian R. Wolf, MD, MS

## FEMORAL TUNNEL POSITIONING AND DRILLING

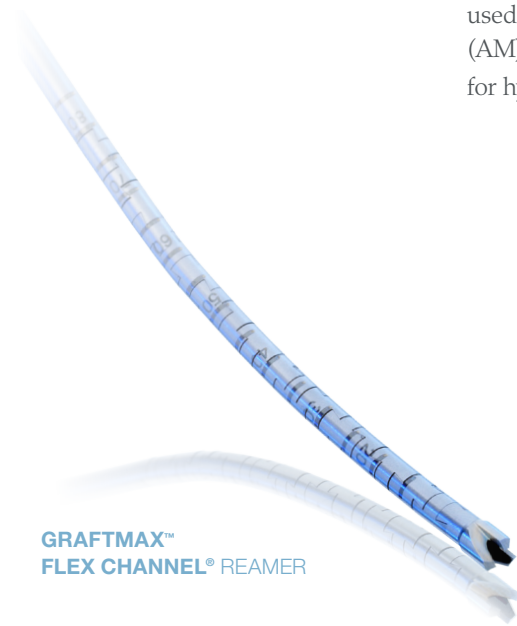


The GraftMax™ Curved Guide and Reamers are designed to be used through the anteromedial (AM) portal without the need for hyperflexing the knee.



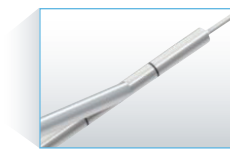
Debride unwanted remnant ACL tissue. Identify the femoral ACL footprint and select the desired location of the femoral tunnel.

The center of the desired tunnel location can be marked using an awl, a radiofrequency wand or a shaver placed through the AM portal.



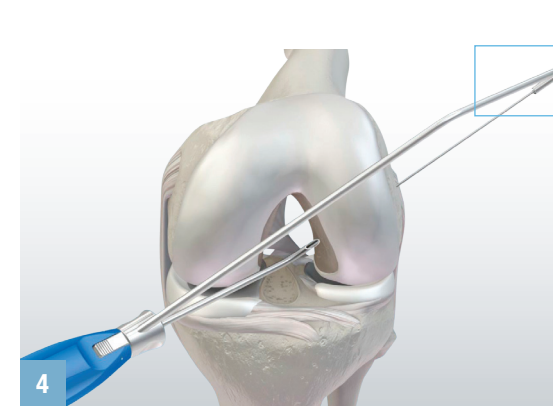
GRAFTMAX™  
FLEX CHANNEL® REAMER

## FEMORAL TUNNEL POSITIONING AND DRILLING

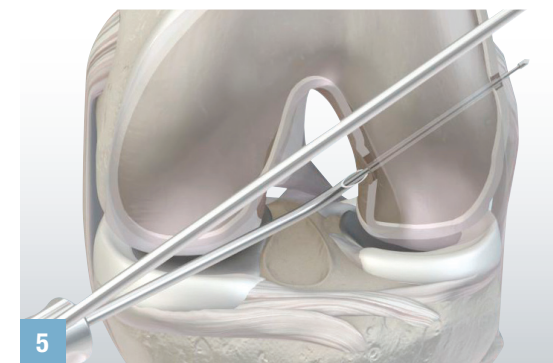


GRAFTMAX™  
CURVED GUIDE

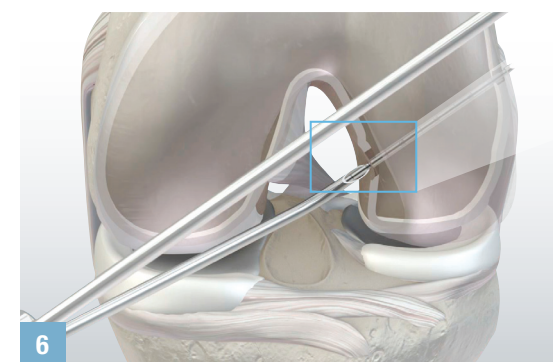
Insert the GraftMax™ Curved Guide into the AM portal with the knee flexed at 90° degrees. Attach the GraftMax™ Indicator onto the Curved Guide.



Insert the GraftMax™ Indicator Pin into the Indicator and down through the skin to bone. Assess the projected GraftMax™ Flex XACTPIN™ Guide Pin exit and femoral aperture to cortex (AC) length.



Once the correct position and angulation are achieved, advance the Flex XACTPIN™ through the Curved Guide so that the pin enters the bone at the desired location of the femoral tunnel. Then advance the pin through the femoral cortex.

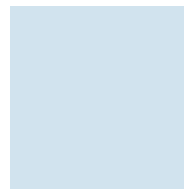


The Flex XACTPIN™ can be pulled back to confirm AC length by hooking the head and reading the markings at the femoral aperture. Flex XACTPIN™ can then be advanced out through the skin laterally using the pin driver. ■

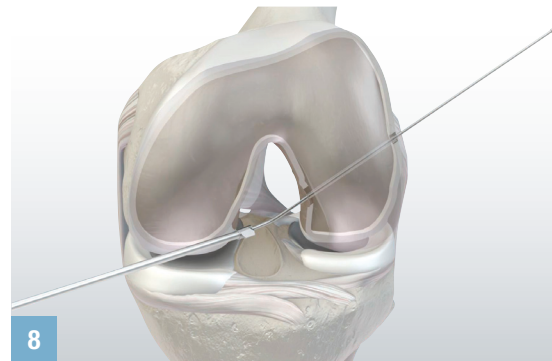
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## FEMORAL TUNNEL POSITIONING AND DRILLING

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Remove the indicator and curved guide leaving the Flex XACTPIN™ in place.



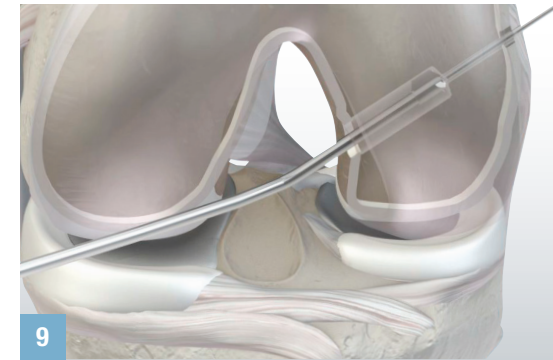
Insert the GraftMax™ Flex Sentinel® Reamer over the Flex XACTPIN™ through the AM portal with the cutting flute facing away from the femoral condyle and advance the reamer to the femoral ACL footprint.

Do not run the power during insertion through the soft tissues as damage to the medial femoral condyle may occur.

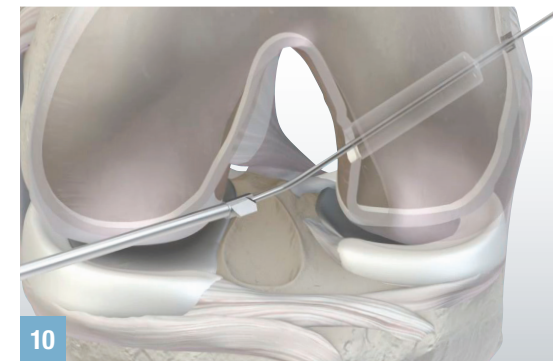


GRAFTMAX™  
FLEX SENTINEL® REAMER

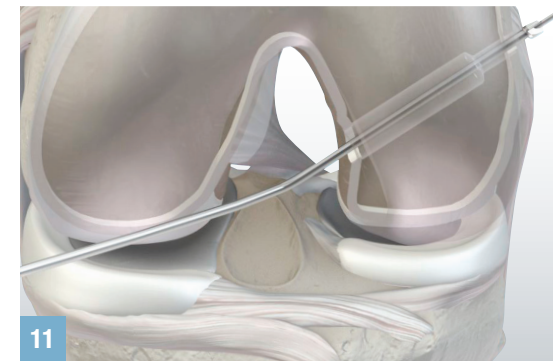
## FEMORAL TUNNEL POSITIONING AND DRILLING



Advance the Flex Sentinel® under power to drill the femoral socket to the desired depth leaving a minimum 5mm bone bridge.



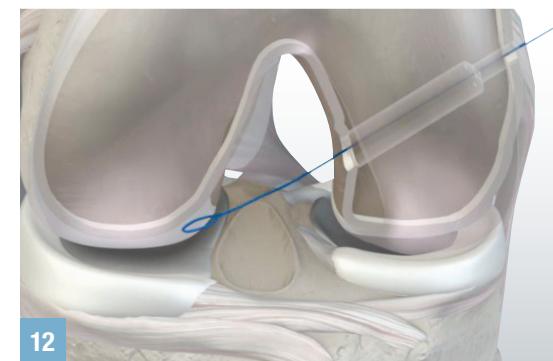
Manually remove the Flex Sentinel® from the joint making sure to keep the blade oriented away from the condylar surface.



Use the GraftMax™ Flex Channel Reamer to ream the femoral channel. Advance the reamer through the lateral cortex.

**TIP:**

The Flex Channel Reamer can be pulled back to confirm AC length by hooking the head and reading the markings at the femoral aperture.



Remove the Flex Channel Reamer leaving the Flex XACTPIN™ in place.

Place the two free ends of a #2 passing suture through the eyelet of the Flex XACTPIN™. Pull the guide pin through the femur laterally, positioning the suture to be used for graft passage after tibial tunnel creation. ■

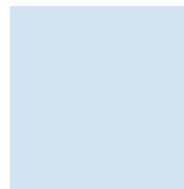
GRAFTMAX™ FLEX  
XACTPIN® GUIDE PIN



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## TIBIAL TUNNEL POSITIONING AND DRILLING

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Set the angle of the Bullseye® Tibial Footprint Guide.

Place the tip of the guide into the center of the tibial ACL footprint and advance the pin sleeve flush to the anterior tibial cortex.



Use the M-Power® 2 handpiece and pin driver attachment to advance the tibial guide pin until it meets the point of the guide arm.

Depress the guide lever to remove the pin sleeve. Remove the Bullseye® Tibial Footprint Guide from the joint.



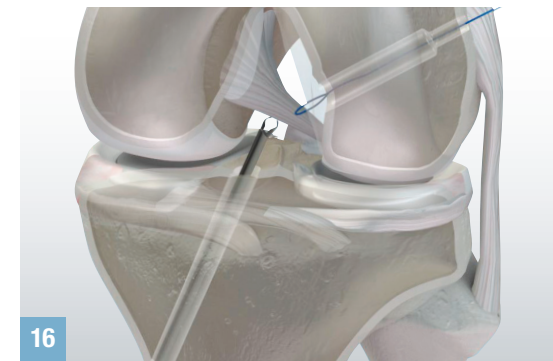
Place a curette over the point of the guide pin to protect against inadvertent advancement when drilling.

Use the appropriate size reamer for the tibial tunnel.



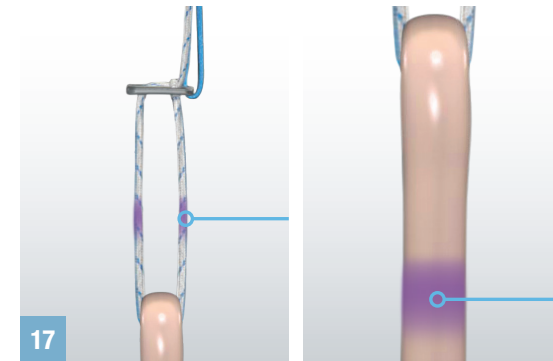
**BULLSEYE® TIBIAL FOOTPRINT GUIDE**

## GRAFT POSITIONING AND FIXATION



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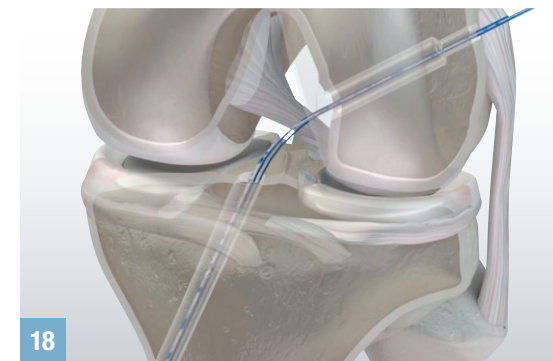
Retrieve the looped end of the passing suture through the tibial tunnel.



17

**Mark the button's striped loop** at the AC length.

**Mark the graft** at the femoral tunnel depth

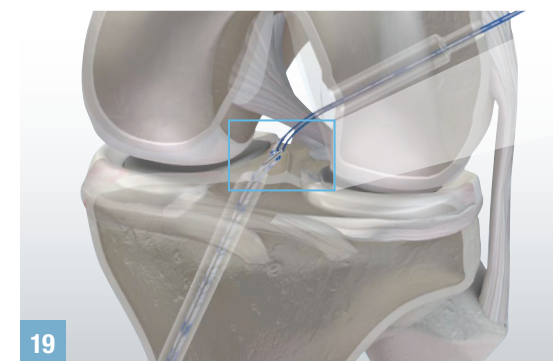


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Load the free ends of the blue and striped sutures of the GraftMax™ Button into the passing suture loop.

Pull the suture loop up through the knee so that all four suture ends from GraftMax™ Button exit skin superolateral to knee.

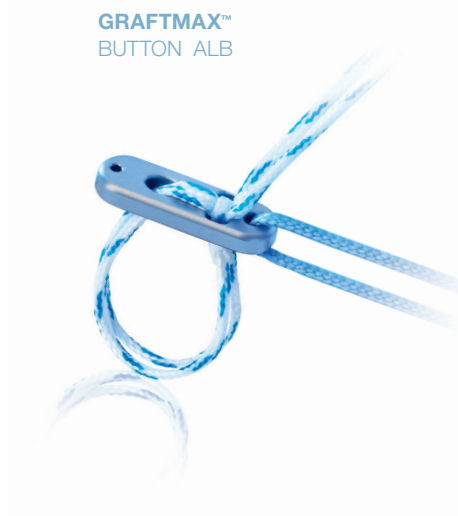
It is recommended to keep graft construct outside the tibial tunnel.



19

Keeping the graft outside the tibial tunnel, apply tension to the blue lead suture to advance the button into the knee joint.

Carefully take slack out of the striped loop sutures taking care to not shorten the loop. ■

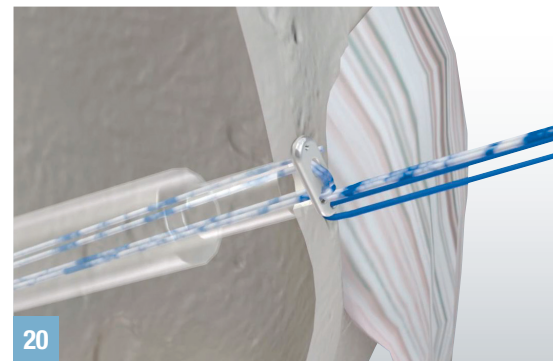


**GRAFTMAX™ BUTTON ALB**

**CONMED SURGICAL TECHNIQUE**

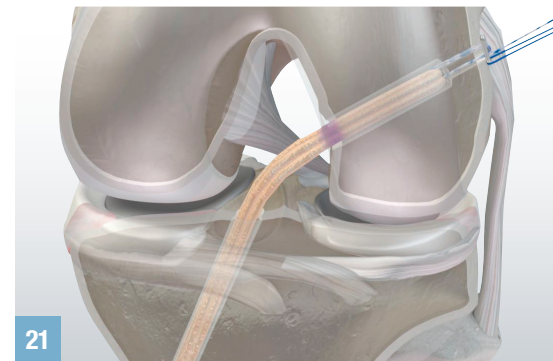
## GRAFT POSITIONING AND FIXATION

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20

The button should now be external to the cortex and deployment can be confirmed by pulling back on the graft.



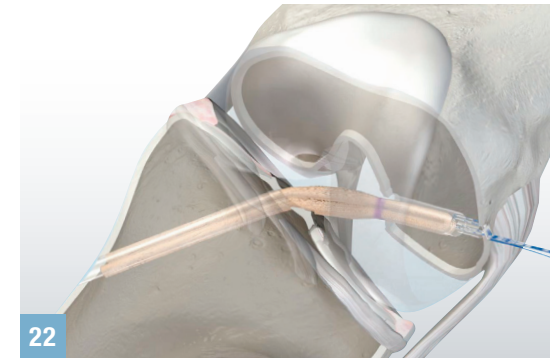
21

Pull the soft tissue graft into the joint by pulling the striped adjustable loop reducing the loop length until the tissue is in the desired position.



GENESYS™ MATRYX®  
INTERFERENCE SCREW

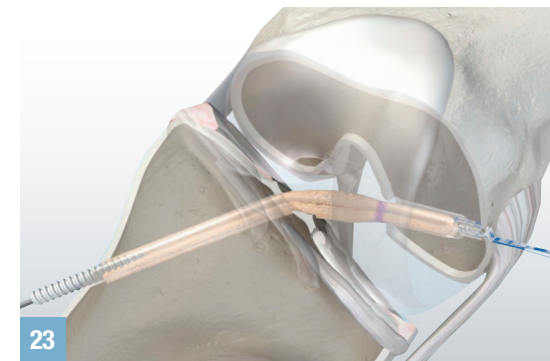
## GRAFT POSITIONING AND FIXATION



22

Cycle the knee with tension on the graft and set knee at desired knee flexion angle, usually 0-15°.

If desired, the button can be retensioned by pulling the sutures from the anterolateral thigh.

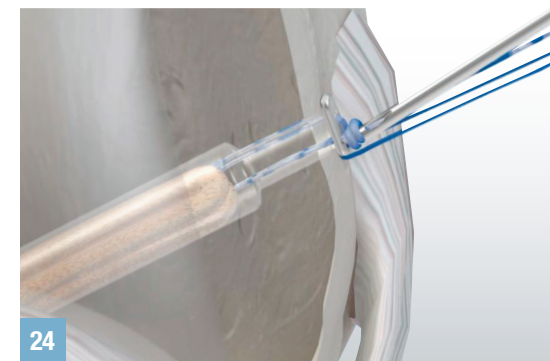


23

With the knee in the desired position, keep tension on the graft and apply posterior drawer force to the knee.

Insert the BioScrew® Hyperflex® Guidewire in the center of the four graft bundles.

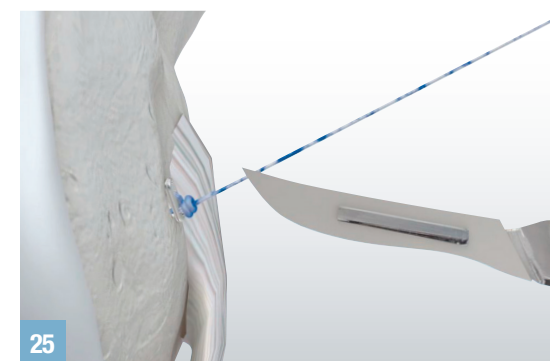
Load the GENESYS™ Matryx® Interference Screw and driver onto the guidewire and advance it into the tibial tunnel until it is flush.



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### OPTIONAL STEP:

An arthroscopic knot pusher can be used to tie a knot in the striped sutures over the top of the button. This can be done percutaneously from the anterolateral thigh.



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Remove the blue passing suture by pulling one suture limb unthreading it from the button. Trim the two strands of the striped adjustable loop tails flush to the skin with a sharp blade.

Follow the normal procedures to close the incisions. ■

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**MTF** Musculoskeletal  
Transplant  
Foundation

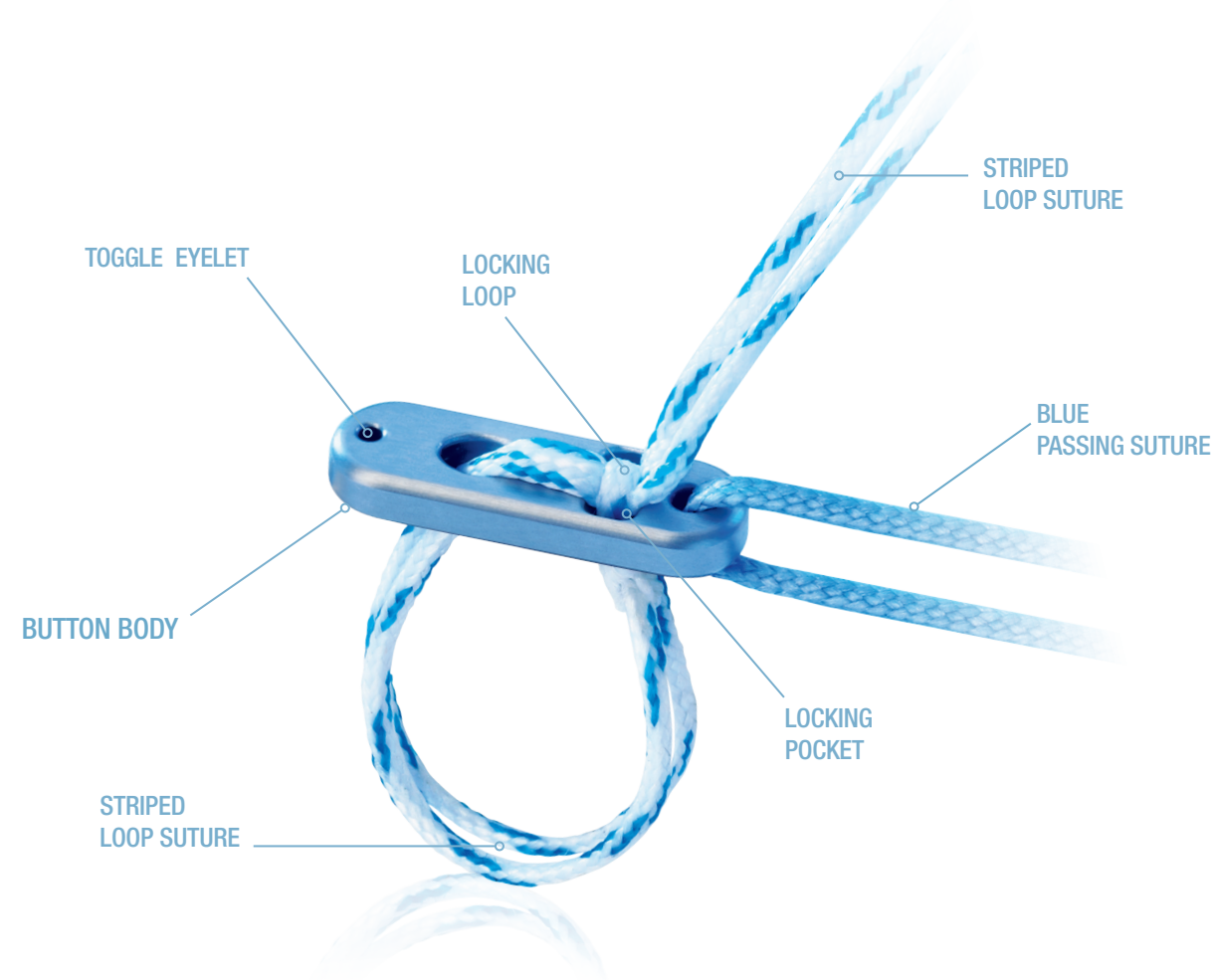


**ANTERIOR  
TIBIALIS TENDON**  
SOFT TISSUE  
ALLOGRAFT

**CONMED  
SURGICAL  
TECHNIQUE**

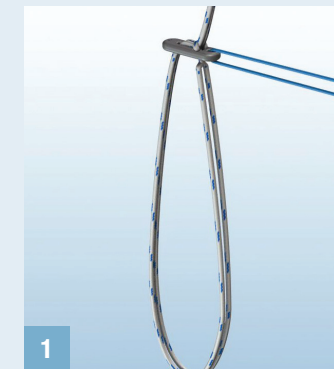
## ANATOMY OF THE GRAFTMAX™ BUTTON ALB

### QUICK REFERENCE



## LOADING AND ADJUSTING GRAFTMAX™ BUTTON ALB

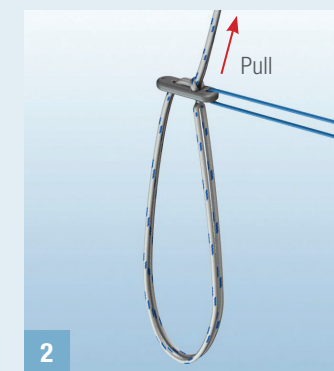
### Adjusting the GraftMax™ Button ALB Loop



It is suggested that the loop length be kept at a length that will allow for the button body to be positioned on the lateral femoral cortex while keeping the graft outside of the knee.

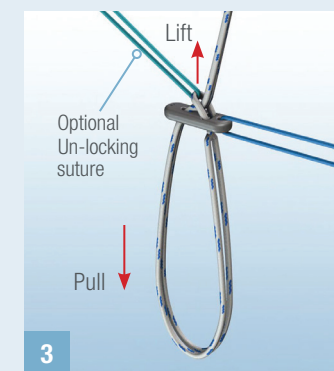
#### NOTE:

This will make the button easier to pass and allow for visual and tactile confirmation of deployment of the button on the lateral femoral cortex.



Pulling the striped loop suture tails will make the loop smaller.

Care should be taken not to pull the striped suture loop tails unless intending to re-size the loop.

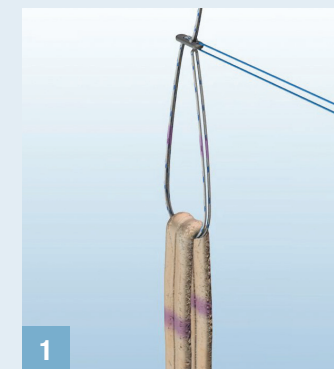


In order to make the loop larger, lift up the locking loop on top of the button body and pull the striped loop suture limb below the button body.

#### OPTIONAL STEP:

An additional suture may be positioned under the locking loop on top of the button to provide a means for unlocking and enlarging the loop in-situ if desired. ■

### Prepping the GraftMax™ Button ALB with Graft



Remove the GraftMax™ Button ALB from packaging. Load the tails of the whip-stitched soft tissue graft into the loop and position it so that the graft is folded in half over the adjustable loop.

Size the button-graft assembly to determine necessary tunnel diameter. ■

## ORDERING INFORMATION

To order any of our GraftMax™ Button products including instrumentation and accessories, GENESYS™ Matryx® Interference Screws and instrumentation, PINN-ACL® Cruciate Guide System and other accessories please call CONMED Customer Service at: (US) **800-237-0619** or, (Global) **727-392-6464**.

### GRAFTMAX™ BUTTONS

GraftMax™ Button ALB	KS-ALB
GraftMax™ Button Cradle	KS-BCA

### GRAFTMAX™ BUTTON ACCESSORIES

GraftMax™ Flex Channel Reamer	KC8550
GraftMax Flex XACTPIN™ Guide Pin	KS-FGP24
XO Button Holder	PS8834

### GRAFTMAX™ CURVED DRILLING SYSTEM

GraftMax™ Curved Guide	KS-CDG
GraftMax™ Indicator	KS-IND
GraftMax™ Indicator Pin	KS-ACP

### GRAFTMAX™ FLEX SENTINEL® REAMERS

5.0mm x 9 in	KS8550	9.0mm x 9 in	KS8590
5.5mm x 9 in	KS8555	9.5mm x 9 in	KS8595
6.0mm x 9 in	KS8560	10mm x 9 in	KS8510
6.5mm x 9 in	KS8565	10.5mm x 9 in	KS85105
7.0mm x 9 in	KS8570	11mm x 9 in	KS8511
7.5mm x 9 in	KS8575	12mm x 9 in	KS8512
8.0mm x 9 in	KS8580	13mm x 9 in	KS8513
8.5mm x 9 in	KS8585		

### TIBIAL GUIDE SYSTEM

PINN-ACL® Cruciate Guide includes ACL Guide Arm and Pin-Sleeve	8731
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### BULLSEYE® TIBIAL FOOTPRINT GUIDE

5.0mm x 9 in	DB5TAM	9.0mm x 9 in	DB7TAM
5.5mm x 9 in	DB6TAM	9.5mm x 9 in	DB8TAM

### ACL ACCESSORIES

Suture Handle	HDL-CLT
Graft Sizing Ring, Large	GFT-LG
Graft Sizing Ring, Small	GFT-SM
EL Depth Probe	21.1001
Bullseye® Femoral Footprint Ruler	RL1000

### GENESYS™ MATRYX® INTERFERENCE SCREWS

5.0mm x 20mm	235020M5	8.0mm x 20mm	238020M5
5.0mm x 25mm	235025M5	8.0mm x 25mm	238025M5
5.0mm x 30mm	235030M5	8.0mm x 30mm	238030M5
5.5mm x 15mm	235515M5	8.0mm x 35mm	238035M5
5.5mm x 20mm	235520M5	9.0mm x 20mm	239020M5
5.5mm x 25mm	235525M5	9.0mm x 25mm	239025M5
5.5mm x 30mm	235530M5	9.0mm x 30mm	239030M5
6.0mm x 15mm	236015M5	9.0mm x 35mm	239035M5
6.0mm x 20mm	236020M5	10.0mm x 20mm	231020M5
6.0mm x 25mm	236025M5	10.0mm x 25mm	231025M5
6.0mm x 30mm	236030M5	10.0mm x 30mm	231030M5
6.5mm x 15mm	236515M5	10.0mm x 35mm	231035M5
6.5mm x 20mm	236520M5	11.0mm x 20mm	231120M5
6.5mm x 25mm	236525M5	11.0mm x 25mm	231125M5
6.5mm x 30mm	236515M5	11.0mm x 30mm	231130M5
7.0mm x 20mm	237020M5	11.0mm x 35mm	231135M5
7.0mm x 25mm	237025M5		
7.0mm x 30mm	237030M5		

### GENESYS™ MATRYX® INSTRUMENTATION

Universal Driver, Modular Ratcheting Handle	D8640
Short Fixed Tri-Lobe Driver for 5.0mm Interference Screws	D8652
Short Modular Tri-Lobe Driver for 5.0mm Interference Screws	D8650
Extended Length Modular Tri-Lobe Driver for 5.0mm Interference Screws	D8660
Short Fixed Tri-Lobe Driver for 5.5 – 6.5mm Interference Screws	D8653
Short Modular Tri-Lobe Driver for 5.5 – 6.5mm Interference Screws	D8651
Extended Length Modular Tri-Lobe Driver for 5.5 – 6.5mm Interference Screws	D8661
Short Fixed Tri-Lobe Driver for 7.0 – 11.0mm Interference Screws	DFS70
Short Modular Tri-Lobe Driver for 7.0 – 11.0mm Interference Screws	DMS70
Extended Length Modular Tri-Lobe Driver for 7.0 – 11.0mm Interference Screws	C8716

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

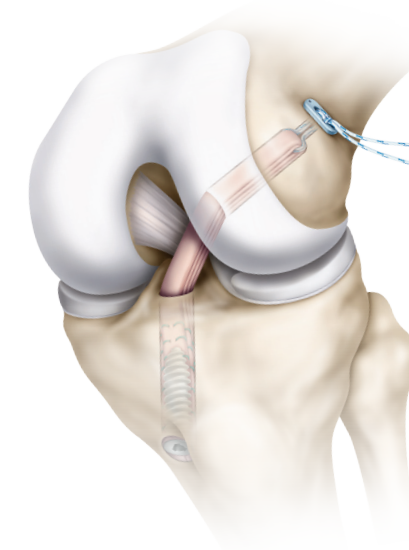
In partnership with



\*Available with folded diameter measurement

### ALLOGRAFT TENDON

	FREEZE-DRIED	FROZEN
Anterior Tibialis Tendon* ≥ 20cm Length	400335	430335
Posterior Tibialis Tendon* ≥ 22cm Length	400340	430340
Peroneus Longus Tendon* ≥ 22cm Length	400356	430345
Semitendinosus Tendon* ≥ 26cm Length	400260	430350
Semitendinosus Tendon* < 26cm Length	400355	430355
Gracilis Tendon* ≥ 20cm Length	400301	430300



*Advancing the Future of Minimally Invasive  
and Orthopaedic Surgery.  
Together.*

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# Knee Preservation System™

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Utica, New York 13502

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