# Volume 18. Number 1

A Technical Pearls Newsletter for Arthroscopists

#### Flexible Reamers for ACL Reconstruction

The Arthrex® Flexible Reamer system facilitates reproducible femoral socket creation from the medial portal without hyperflexion of the knee. An innovative, flexible link design allows unmatched flexibility with increased strength over standard "puzzle-piece" designs.1

#### A Better Guide

The curved pin guide passes easily through a standard medial portal while avoiding the femoral condyle and PCL. The spiked tip is easily stabilized on the femur without hyperflexion and allows ideal trajectory through the femur.



#### Flexible Driver and Tap

Flexible shafts facilitate placement of either BioComposite™ or PEEK Interference Screws into femoral sockets reamed with flexible reamers, ensuring similar trajectory and alignment of the socket, graft and screw.



Unique Flexible Guide Pins allow bending in the curved guide, but retain enough stiffness to drill straight through bone without divergence. Depth markings assist with tunnel measurement.

Flexible Reamer with Guide Pin Sets AR-1400F-70 - 110



ACL reconstruction. JBJS Case Connect. 2014;4(4):e94. doi:10.2106/JBJS.

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#### FiberTak™ DR and SwiveLock® C Anchors for Knotless Rotator Cuff Repair

The FiberTak DR (double row) suture anchor is specifically designed for surgeons who prefer an "all-suture" anchor for the medial row of a double row, bridging rotator cuff repair. They are combined with knotless SwiveLock C anchors for the lateral row. The unique FiberTak DR anchor has a LabralTape™ suture that is fixed to the sheath so that it cannot slide, making it easy to tension the lateral row of a totally knotless construct. It also includes a sliding #2 FiberWire® TigerTail® suture that can either be incorporated into the repair or discarded, providing ultimate flexibility.



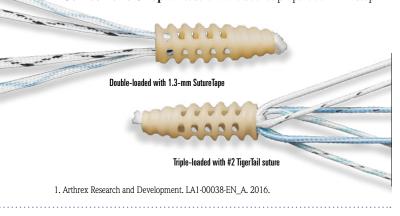
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# Upper Extremity

#### PEEK Corkscrew® FT Anchor

Introducing the maximally vented 4.75-mm Corkscrew FT anchor with double-loaded SutureTape and triple-loaded #2 TigerTail® suture options. These anchors were designed specifically for surgeons who want "more vents" and/or prefer small, triple-loaded anchors. *Biocomposite material versions coming soon.* 

- **Maximally vented** with vents on 4 sides which may allow blood and bone marrow flow and bony ingrowth
- **Double-loaded option** with 1.3-mm SutureTape with #2 tails that is optimized for knot-tying, passing with a Scorpion™ suture passer and loading into knot pushers. SutureTape is a flat-braided #2 suture that is similar in strength to #2 FiberWire suture, but is 21% more resistant to tissue pull-through. It offers improved handling and knot security and smaller comparable knot stacks (compared to suture¹).
- **Triple-loaded option** with #2 TigerTail suture, an exclusive Arthrex® option that distinguishes all 6 suture limbs independently for ease of suture management and is excellent for teaching
- **Proprietary suture eyelet** technology for smooth suture sliding and unrestricted anchor orientation
- Combo Punch/Tap for ease of bone socket preparation in 1 step



#### **Slotted Lobster Claw Forceps**

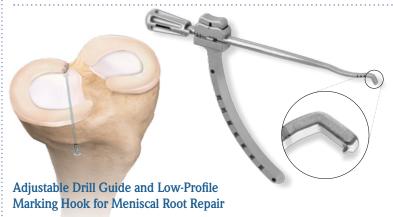
The slotted lobster claw forceps allow surgeons to maintain fracture reduction and place a plate through the jaws without having to switch out forceps. Traditional lobster claw forceps often require surgeons to switch out forceps or place K-wires to maintain reduction prior to plating the fracture. These unique clamps are designed to work with the clavicle and ankle fracture plating systems as well as many other Arthrex plating systems, including the wrist plating system and the comprehensive foot system.

# Knee and Hip

#### Anterolateral Ligament (ALL) Reconstruction

ALL reconstruction is aimed at augmenting rotational stability in the anterior cruciate ligament (ACL)-reconstructed knee. Because combined injuries to both the ACL and ALL or deep iliotibial (IT) band act as a prerequisite for the occurrence of an International Knee Documentation Committee (IKDC) grade III pivot-shift, ACL-injured patients with a high-grade pivot shift might benefit from an additional anterolateral reconstruction in order to avoid persistent rotational laxity.

Hyperlax females with excessive recurvatum and physiologic joint laxity are potentially appropriate candidates for combined ACL reconstruction and extra-articular stabilization. Furthermore, in ACL-injured pivoting athletes who require absolute stability, anterolateral reconstruction should be contemplated if only an IKDC grade II pivot shift is present. Finally, revision anterolateral ligament reconstruction (ALR) cases commonly exhibit significant rotational laxity due to a tendency for increased joint laxity from previous meniscus removal or resultant laxity of secondary ligamentous restraints. Especially in the absence of frank retrauma or obvious technical errors explaining graft failure, concomitant ALL reconstruction should always be considered as a means of improving stability in these complex cases.

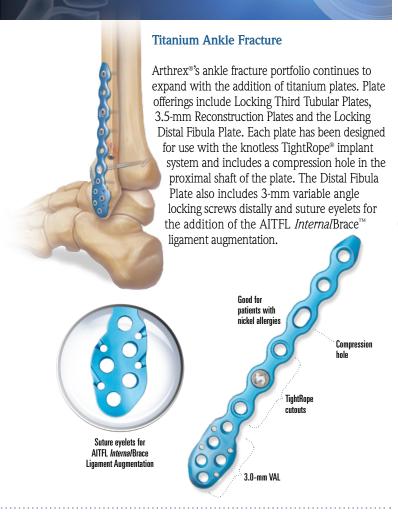


Historically, meniscal root tears have gone largely untreated. However, recent literature has shown the loss of meniscus hoop stress due to a meniscus root disruption can have long-term negative effects for the patient. If left untreated, the condition could lead to progressive degenerative changes and early degenerative joint disease.

Arthrex®'s Adjustable Drill Guide and Low-Profile Marking Hook are specially designed to position over the back of the tibia for reproducible meniscal root repair. The adjustable guide can be set to a 5-mm, 7.5-mm or 10-mm offset from the posterior tibia for socket creation using a 6-mm or 7-mm FlipCutter® reamer to create a 5 mm to 10 mm deep socket. The drill guide can swivel to the optimal position on the anterior tibia to avoid concomitant tunnels and fixation devices.

 LaPrade RF, Matheny LM, Moulton SG, James EW, Dean CS. Posterior meniscal root repairs: outcome of an anatomical transtibial pull-out technique. Am J Sports Med. 2016;45(4):884-891. doi:10.1177/0363546516673996.

## Distal Extremities

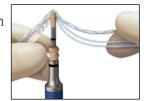


### Hand & Wrist *Internal* Brace Ligament Augmentation with the DX SwiveLock® SL Anchor

The 3.5 mm x 8.5 mm DX SwiveLock SL anchor creates new opportunities to add an *Internal*Brace construct to soft-tissue repairs in the hand. The screw-in, knotless SwiveLock anchor offers multiple advantages, such as a low-profile construct, quick graft insertion through a forked-tip eyelet and the ability to incorporate graft and suture for an *Internal*Brace ligament augmentation.

Thumb UCL and RCL repairs with *Internal* Brace ligament augmentation are one of the most exciting indications, with biomechanical research showing that at time zero, a thumb UCL repair with

*Internal*Brace ligament augmentation is 4x stronger than a standard repair with an anchor alone. Other indications include scapholunate reconstructions and CMC suspensionplasty.



1. Arthrex Research and Development. LA1-00046-EN\_A. 2016.

# Imaging & Resection

#### New Retractable Hood Burrs

Retractable Hood Burrs are a series of round and oval burrs adapted to our PowerPick "micro-drilling" instruments for the purpose of retracting the hood during application where increased burr-head exposure is preferred. These versatile devices are available in 2 working lengths: hip length (18 cm) and standard length (13 cm). In addition, a larger  $\emptyset$ 5.5-mm burr head is available in the hip length line.

By using the Retractable Hood Burrs, you can quickly adapt to the working environment with a one-handed flick of a lever, providing the ability to change its head exposure without opening a second device or even removing it from the joint space, if desired.

This variable exposure is designed with optimum surgical efficiency in mind.

#### New DrillSaw Sports 400<sup>™</sup> System

The DrillSaw Sports 400 system is a small/medium bone orthopedic battery-powered system for the resecting of bone, drilling, reaming and driving pins/wires to correct orthopedic deformities, treat injuries and general orthopedic procedures. The new charge indicator feature allows surgeons and OR staff to view battery life at any time during a case.

The new universal battery charger charges up to 4 Arthrex® batteries at once, including those for the DrillSaw Max  $600^{\text{TM}}$  and the DrillSaw Mini  $300^{\text{TM}}$  Power Systems. The LED touch screen on the charger will not only indicate the charging status on the battery, but will communicate with the new DrillSaw Sports 400 smart battery to indicate the number of times the batteries have been used.



#### Synergy<sup>RF™</sup> Bipolar Ablation System with Apollo<sup>RF®</sup> Probes



Watch the video to see the features and benefits of the Synergy Bipolar System with the Apollo<sup>RF</sup> probes.

http://cptr.it/STOSynergy

# Orthobiologics

#### ArthroCell™ Cellular Bone Graft



ArthroCell is a moldable, viable cellular allogenic bone graft derived from human bone marrow that is intended for use in bone defects, fusions and non-union orthopedic applications. Arthro-Cell bone graft is processed in full compliance with FDA guidelines regarding human cells, tissues and cellular tissue-based products as a

safe, non-immunogenic alternative to autograft. ArthroCell bone graft provides the essential elements for optimal bone repair including a 3-dimensional osteoconductive scaffold that provides increased surface area for optimal cell attachment, osteoinductive potential from signaling molecules such as bone morphogenic proteins that aid in cell differentiation down osteoblastic pathways and viable mesenchymal stem cells to support osteogenic healing processes.





#### **Angel® System Powered BMC Kit**

The Angel system utilizes proprietary sensor technology and 1-button automation to deliver customized bone marrow concentrate (BMC). Bone marrow is a rich source of platelets, and nucleated and progenitor cells. The Angel system provides the clinician with the ability to effectively, safely and rapidly obtain high-quality bone marrow aspirate. Precise control, rapid access and improved efficiency will produce larger specimens in less time with less pain. 1-4

- Berenson JR, Yellin O, Blumenstein B, et al. Using a powered bone marrow biopsy system results in shorter procedures, causes less residual pain to adult patients, and yields larger specimens. *Diagn Pathol.* 2011;6:23. doi:10.1186/1746-1596-6-23.
- Garcia G, Miller LJ, Philbeck T, Bolleter S, Montez DF. Tactile feedback allows accurate insertion
  of a powered bone access device for vertebroplasty and bone marrow sampling procedures. J Vasc
  and Interv Radiol. 2011;22(3):S86. doi:10.1016/j.jvir.2011.01.220.
- Miller LJ, Philbeck TE, Montez DF, et al. Powered bone marrow biopsy procedures produce larger core specimens, with less pain, in less time than with standard manual devices. *Hematol Rep.* 2011; 3(1):e8. doi:10.4081/hr.2011.e8.
- Lee RK, Ng AW, Griffith JF. CT-guided bone biopsy with a battery-powered drill system: preliminary results. AJR Am J Roentgenol. 2013;201(5):1093-1095. doi:10.2214/AJR.12.10521.



## TOP 10 VIDEOS OF 2017 What's New

#### Top 10 Videos of the Year

As a leader in medical education, we're bringing you exclusive access to our premier surgical technique videos and related science for our emerging technology and techniques through the weekly What's New email and daily What's New features on <a href="https://example.com/Arthrex.com">Arthrex.com</a>. Stay connected by signing up to receive What's New emails: <a href="https://example.com/creative-com/creat

See the *Top 10 What's New* videos of the year here: <a href="mailto:cptr.it/STOtop10">cptr.it/STOtop10</a>. Click on the thumbnails below to watch each individual video.



BreakThrough™ Session with Chris Adams, MD: Anterolateral Ligament Augmentation with ACL Reconstruction



BreakThrough with Chris Adams, MD: Virtual Implant Positioning™ (VIP™) System



Superior Capsular Reconstruction (SCR)



Quad Tendon Harvest with Patella Bone Block



Adjustable Meniscal Root Marking Hook with Knee Scorpion™ Suture Passer



Superior Capsular Reconstruction (SCR) using Knotless SutureTak® Anchor



**Endoscopic Gastrocnemius Recession** 



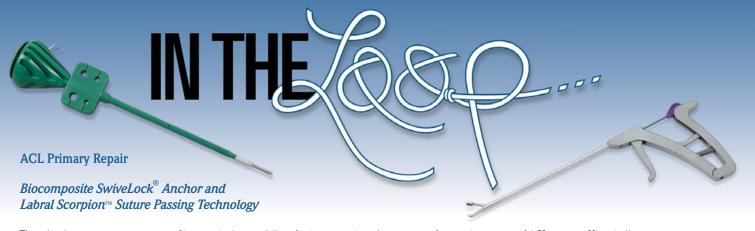
Achilles Midsubstance Surgical Repair using the Achilles Midsubstance SpeedBridge™ System



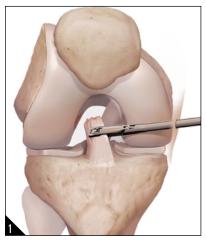
Synergy MSK™ Ultrasound Imaging Platform



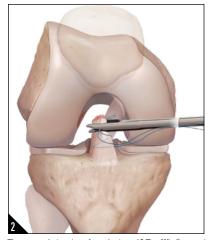
Short FlipCutter® II Reamer and Side-Release RetroConstruction™ Guide System



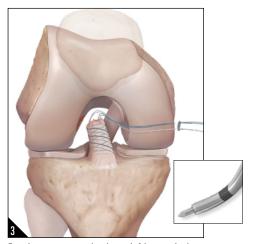
There has been a recent resurgence of interest in the possibility of primary repair as the treatment for certain patterns of ACL rupture. Historically, the technique of primary ACL repair was largely abandoned by the mid-1990's due to marginal clinical outcomes. However, careful analysis of the older data reveals that certain subgroups, especially proximal tears with good tissue quality, had better clinical outcomes than the group as a whole.



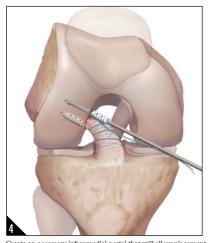
Suture passage through the ACL tissue begins at the intact portion of the ligament and progresses towards the avulsed end. Begin by passing a #2 FiberWire® suture using the Labral Scorpion suture passer. After the first pass, alternate passes with opposite ends, thus creating a Bunnell-type stitch pattern. In a normal length ACL, a total of 2-3 passes can be performed with each limb of the FiberWire suture. The final bite should exit the avulsed end of the ligament to ensure that the tissue sits down flush to the repair site.



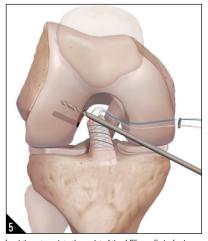
The same technique is performed using a #2 TigerWire® suture. As more passes are performed, the risk of transecting already placed sutures increases. Once the Scorpion suture passer is placed for a suture pass, the surgeon should get tactile feedback of increased resistance attempting to pass the suture if he or she is intersecting a previously placed stitch. If this occurs, the Scorpion suture passer should be redirected and suture passage reattempted. Again, the final bite should exit the avulsed end of the ligament to ensure that the tissue sits down flush to the repair site.



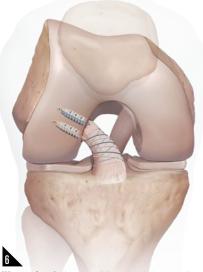
Once the sutures are passed, and control of the stump has been achieved, the sutures are parked out an accessory stab incision to retract the ligament away from the reattachment site. This allows both the ligament tissue and the sutures to stay out of harm's way while the reattachment site can be prepared with a shaver, a burr or a PowerPick\* resector (inset).



Create an accessory inferomedial portal that will allow placement of the suture anchors directly into the femoral footprint. Through this portal, with the knee in flexion,  $4.5~{\rm mm} \times 20~{\rm mm}$  drill holes can be made to place the anchors. The anchor pattern should be optimized depending on the pattern of tear, much like a rotator cuff repair. This will be an intraoperative decision. Note: Some surgeons prefer to visualize the ACL femoral footprint via the medial portal to optimize visualization and placement of the drill holes and anchors.



Load the sutures into the eyelet of the 4.75-mm SwiveLock anchor. Introduce the SwiveLock anchor through the medial portal, insert into the ACL footprint and tension the SwiveLock sutures. Advance the driver into the bone socket until the anchor body contacts bone. Advance the screw by holding the thumb pad as the inserter handle is turned clockwise.



When the SwiveLock anchor is fully implanted, the eyelet of the anchor is fully seated in the socket by the body of the screw portion of the anchor and the sutures are fixated by the pressure of the screw. Unwind the tip retention suture from the cleat at the back of the driver handle. Remove the driver. Pull one limb of the retention suture to fully remove it from the implant. Cut the free suture ends with an open ended Suture Cutter so that they are flush with the edge of the bone socket.

## What's in My Bag?



**Featuring Orr Limpisvasti, MD** Anaheim Ducks Hockey Team

#### Benefits of Synergy MSK™ Ultrasound Imaging

Orr Limpisvasti, MD, is a sports medicine surgeon and the medical director for the Anaheim Ducks hockey team. He also serves as an orthopedic consultant to many other professional athletes and sports teams. Here, Dr. Limpisvasti talks with us about ultrasound and specifically, the benefits of the wireless Synergy MSK ultrasound, a handheld, wireless ultrasound that transmits real-time images to an iOS or Android mobile device.



#### O. How has ultrasound helped you treat your patients?

A. Ultrasound provides a non-radioactive modality for visualizing superficial structures in real-time. Ultrasound has allowed me to expand my treatment options and improve my injection technique; I have increased accuracy as I am able to visualize the medication as it is being delivered into the desired location. My diagnostic capabilities have improved significantly as well with immediate visualization of soft-tissue pathologies that drive treatment decisions without waiting for 'scheduled' imaging. I am able to effectively monitor soft-tissue healing intermittently to refine and often speed up the rehabilitation process post-surgery or injury. My patients immediately see value in the technology and are engaged in the treatment plans.

#### O. What advantages do you see with Synergy MSK ultrasound?

A. The Synergy MSK ultrasound with its increased portability and quick setup improves workflow compared to larger ultrasound units as it doesn't require staff time to set up and move a bulky machine. With the iPad as the interface, it's easy to use and minimizes the button fatigue of more complex ultrasound systems on the market today. Patients are impressed by being able to visualize their pathology on an iPad and see real-time what is going on. With the current price point, my colleagues and I can better access an ultrasound unit and avoid scheduling issues.

#### Q. How has ultrasound helped with your current care of sports teams and professional athletes?

A. The portability of the Synergy MSK ultrasound makes it ideal for the care of sports teams because it can be taken on road trips and off-site destinations. Now I have the ability to diagnose in the training room whether at home or on the road. Increasing the availability of ultrasound allows for monitoring of healing and performing diagnoses of common contact injuries throughout the course of the season and post-season. Synergy MSK ultrasound allows me to provide improved care for professional athletes and provide teams with more information for making quick decisions.



#### O. What technical pearls can you offer for learning to read ultrasound?

A. To improve my acumen with ultrasound, I often compare MRI scans that I would normally perform with new live-time ultrasound. I always compare any pre-op MRI scans to ultrasound in the OR prior to surgery to gain valuable feedback. Using direct comparison of ultrasound and arthroscopic surgical findings has also provided a means for improving diagnostic accuracy.

## O. What other areas could possibly be impacted by using Synergy MSK ultrasound?

A. With Synergy MSK ultrasound, the increased potential applications are numerous. Some that come to mind are the ability to use the system for procedures that require C-arms to be brought into the OR. The ultrasound would also work well for assisting in regional anesthesia and helping to manage certain complications in recovery such as hematomas, urinary retention and DVT.



## **Pointers & Pearls**



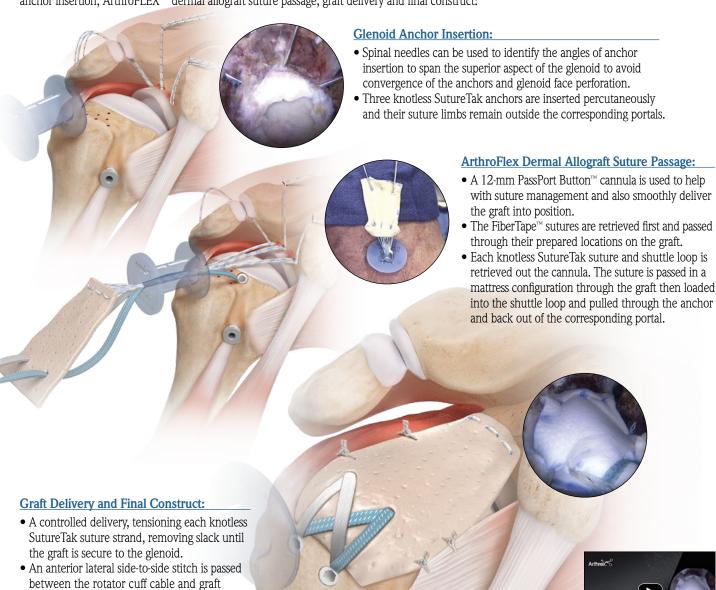
without over constraining the shoulder.

\*ArthroFLEX is a registered trademark of LifeNet Health.

**Featuring Christopher Adams, MD** Vice President of Global Education Arthrex, Inc.

#### Superior Capsular Reconstruction (SCR) Using Knotless SutureTak® Anchors

Chris Adams, MD, provides pointers and pearls for SCR repair with knotless SutureTak anchors for medial graft fixation, featuring tips on glenoid anchor insertion, ArthroFLEX®\* dermal allograft suture passage, graft delivery and final construct:



www.arthrex.com/SCR-KLST

To view the cadaveric video highlights, visit

# SOS<sup>TM</sup> Global Registry

The Surgical Outcomes System™ (SOS) global registry is an orthopedic and sports medicine resource enabling physicians to easily collect and analyze patient outcomes and treatment procedures to quantify results for quality assurance, reimbursement, marketing and research. SOS global registry de-identified data, comprised of more than 72,000 patients, provides an average of postoperative pain expectations for procedures like the graph below of the Double Row RCR: Knotless SpeedBridge™ Repair vs Knotted Repair.

#### Featured Report:

Double Row RCR: Knotless SpeedBridge Repair vs Knotted Repair

#### **Purpose**

To report the early clinical outcomes of pain, function, and quality of life for patients who have undergone double row rotator cuff repair utilizing knotless SpeedBridge technique vs traditional knotted technique.

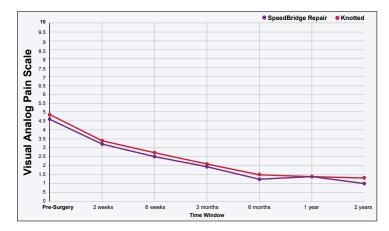
#### Methods

The inclusion criteria for this analysis were patients enrolled in the Surgical Outcomes System registry who underwent a double row RCR that utilized either knotless SpeedBridge or traditional knotted repair (including knotted SpeedBridge and SutureBridge™ repairs) based on site data entry. Standard patient-reported outcomes questionnaires for VAS, ASES Index, ASES Function and SANE were administered at standard time points postoperatively. Results were reported from pre-surgery out to 2 years post-surgery.

#### Trend Conclusion

Based on these results for double row rotator cuff repairs, there appears to be a similar trend in pain, function and quality of life scores for knotless SpeedBridge technique vs traditional knotted technique. For this comparison, approximately ½ of the cases documented operative time. The average operative time was approximately 15 minutes less for cases that utilized knotless technology. However, further statistical analysis would be needed to determine if these findings have statistical significance.

#### Results



## Surgical Outcomes System

#### **STO Featured Product Information**

Adjustable Locking Guide	
Meniscal Root Marking Hook	AR-1610MR
FiberTak <sup>™</sup> DR Anchor w/white LabralTape <sup>™</sup>	
and blue/black #2 TigerTail® Sutures	AR-3651
FiberTak DR Anchor w/white/black LabralTape	
and white/green #2 TigerTail Sutures	AR-3651T
FiberTak DR Anchor w/white/blue LabralTape	
and white/black #2 TigerTail Sutures	AR-3651TT
PEEK Corkscrew® FT Anchor, triple-loaded	
PEEK Corkscrew FT Anchor w/SutureTape	
Lobster Claw Plate Grasper w/Slot	
Anterolateral Ligament Reconstruction Implant System	
Flexible Reamer with Guide Pin Sets	
Titanium Fracture Plate	
PEEK SwiveLock® SL Suture Anchor, 3.5 mm	
Retractable Hood Round Burr, HL, 4 mm x 18 cm	
Retractable Hood Round Burr, HL, 5 mm x 18 cm	
Retractable Hood Round Burr, HL, 5.5 mm x 18 cm	
Retractable FlushCut Oval Burr, 5 mm x 13 cm	
Retractable FlushCut Oval Burr, 5.5 mm x 13 cm	
DrillSaw Max 600 <sup>™</sup> Handpiece	
Pin Driver	
DrillSaw Sports 400™ Handpiece	
Pin Driver	
Synergy <sup>RFTM</sup> Console	
Synergy <sup>RF</sup> Footswitch	
Apollo <sup>RFTM</sup> Hook Probe	
ArthroCell® Bone Graft, 2.5 cc	
ArthroCell Bone Graft, 5.0 cc	
Mixing Syringe	
Angel® System Powered BMC Kit	ABS-10062D
ACL Primary Repair:	
Biocomposite SwiveLock Anchor	
#2 TigerWire® Suture	
#2 FiberWire® Suture	
Labral Scorpion™ Suture Passer	
Drill, 4.5 mm, cannulated	
Synergy MSK™ Linear Scanner	
Synergy MSK Curvilinear Scanner	
ArthroFlex® Dermal Allograft	AFLEX301

For more information or to order, contact your Arthrex representative or call Customer Service at 800-934-4404.



Scope This Out is an informational newsletter designed to educate orthopedic surgeons on state-of-the-art surgical procedures and "pearls" to assist in improving surgical skills. This newsletter is published quarterly by Arthrex, Inc., exclusively for the orthopedic surgeon community.

Arthrex's Corporate Headquarters is located in Naples, Florida. Additional locations include a global division in Munich, Germany as well as several subsidiaries and distribution centers throughout the world.

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