

Foot and Ankle Nano Arthroscopy

Surgical Technique



Introduction

Size matters in foot and ankle arthroscopy. Harnessing 20 years of excellence in designing arthroscopic hand instrumentation, Arthrex has engineered the next generation of nano-sized instruments for diagnostic, therapeutic, and surgical procedures. Introducing the retractable NanoProbe and a full line of 2.0 mm instruments including the NanoBiter, NanoScissor, and NanoGrasper at lengths of both 70 mm and 130 mm. When used in conjunction with the NanoCannulas and the NanoScope™ system, these instruments give foot and ankle surgeons the ability to diagnose and treat a number of pathologies.

The small 1.9 mm diameter of the NanoScope™ camera allows foot and ankle surgeons to easily access a multitude of areas for anterior and posterior ankle arthroscopy, subtalar joint arthroscopy, posterior tibialis and peroneal tendoscopy, 1st MTP joint arthroscopy, and even arthroscopy of the midfoot joints. These previously unreachable locations are now within reach with the NanoScope platform.



Foot and Ankle Nano Equipment and Supplies

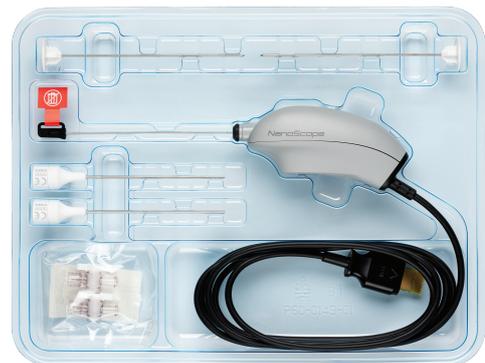
NanoScope™ Tablet Control Unit

- 13" HD monitor
- Handpiece connector
- Microphone
- Ethernet, USB, and HDMI ports
- Wireless network capabilities



Disposable Camera Kit

- Disposable camera
- 2 Inflow cannulas
- 1 Sharp trocar
- 1 Blunt trocar
- 2 Fluid stopcocks



Nano Arthroscopy Prep Kit

- (2) 10 cc Syringes
- 1 IV Bag adapter
- 15 Blade mini scalpel
- Disposable floor drape
- 2 Sterile towels
- 1 Elastic bandage

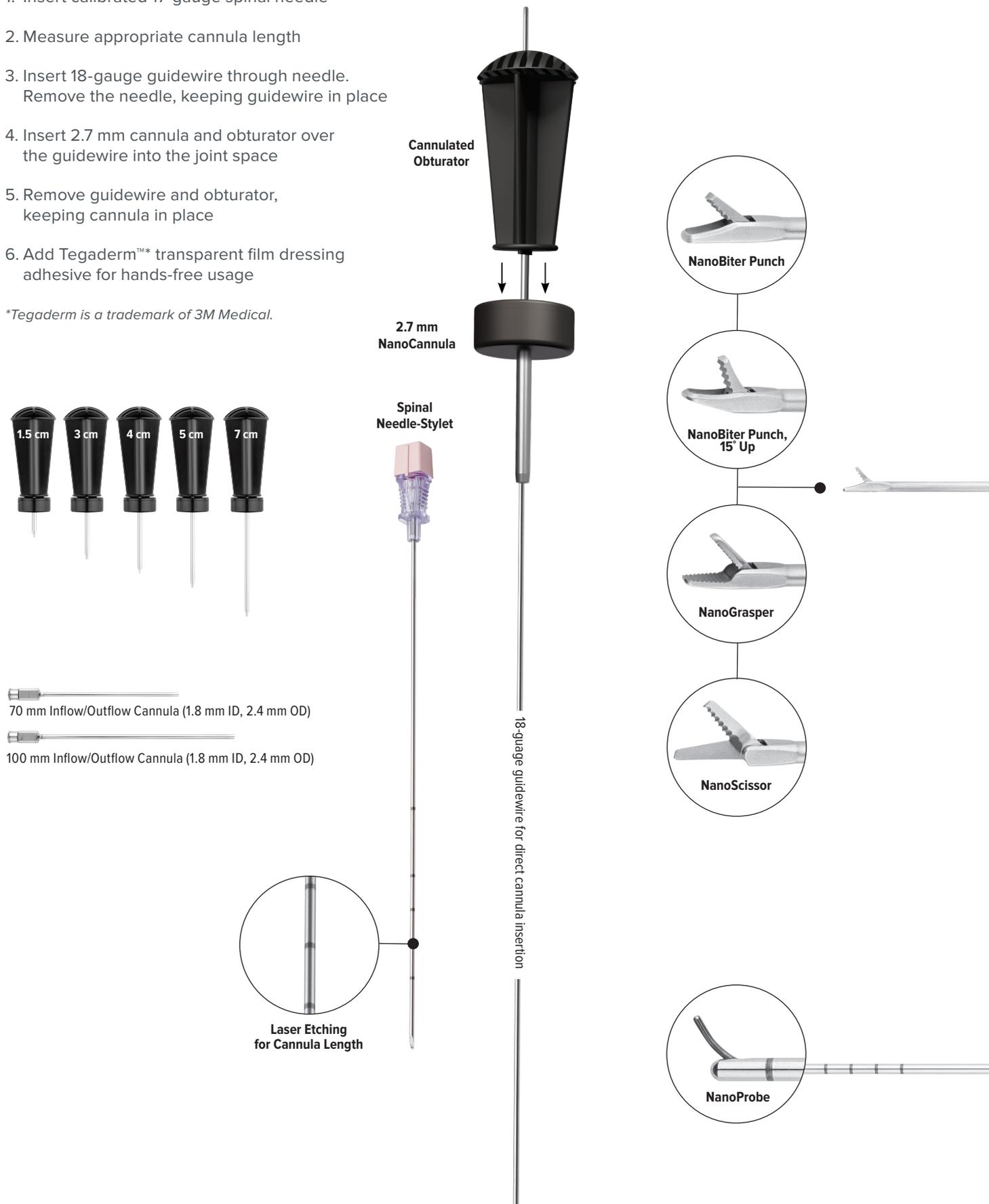


2.7 mm NanoCannula and Insertion Kit

NanoCannula Insertion Recommendation

1. Insert calibrated 17-gauge spinal needle
2. Measure appropriate cannula length
3. Insert 18-gauge guidewire through needle. Remove the needle, keeping guidewire in place
4. Insert 2.7 mm cannula and obturator over the guidewire into the joint space
5. Remove guidewire and obturator, keeping cannula in place
6. Add Tegaderm™* transparent film dressing adhesive for hands-free usage

*Tegaderm is a trademark of 3M Medical.



2 mm Ankle, Single-Use Sterile Resection Instruments (70 mm and 130 mm lengths)

- NanoBiter punch
- NanoBiter punch, 15° up
- NanoGrasper
- NanoScissor
- NanoProbe



Small Joint NanoBiter Punch - 70 mm
(actual size)



Standard Length, Single-Use Nano Arthroscopy Instrument - 130 mm
(actual size)

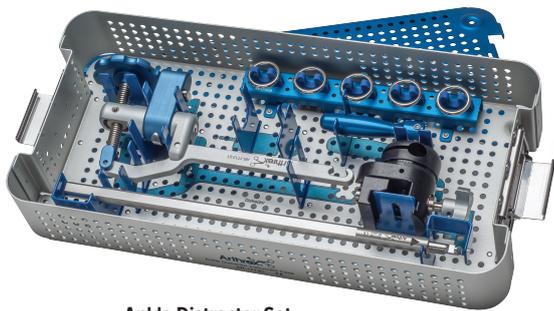


Retractable NanoProbe (actual size)

Arthrex Ankle Distractor and Straps

The noninvasive ankle distractor is designed to provide ankle distraction in a simple and effective manner. With the large tensioning wheel, the surgeon can easily increase or decrease the desired tension during diagnostic or surgical arthroscopy procedures. The quick, snap-on Clark rail adapter makes attachment and rough tensioning of the device simple and hassle-free. A complete arthroscopy setup is achieved when used in conjunction with the small joint limb holder and ankle strap.

The ankle arthroscopy distraction strap is used in conjunction with the noninvasive ankle distractor. It is made of strong nylon strapping material with soft nonslip foam pads for patient comfort and secure hold. This easy-to-use, one-size-fits-all device offers effective traction and grip, which gives the surgeon a distinct advantage over current distraction methods.



Ankle Distractor Set



Ankle Distractor Strap

Small Joint Shaver and Various Blades/Burrs, PowerPick™ Devices, and PowerRasp™ Devices

Made with the same attention to detail as their larger counterparts, the disposable small joint shaver blades and burrs provide outstanding performance in bone and tissue resection applications. The disposable small joint shaver blades and burrs can be used in all Arthrex shaver handpieces and can be inserted with the cutting window in the up or down orientation.



Synergy^{Resection™} Shaver Console



**Small Joint Foot Control
Shaver Handpiece**

Procedural Preparation and Patient Positioning

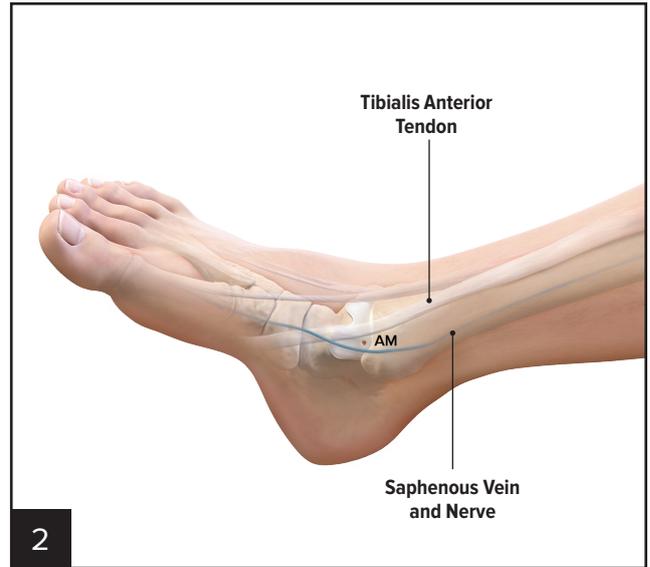
Regardless of the level of patient sedation and anesthesia, the surgical field should be prepped and draped in the surgeon's usual sterile fashion. This sterile surgical field should be maintained throughout the procedure.

Arthrex-specific equipment to have available:

- NanoScope™ disposable camera pack
- DualWave™ outflow tubing with ReDeuce™ tubing (AR-6411 and AR-6435)
- All 70 mm Nano arthroscopy linear instrumentation available
- All NanoCannulas and percutaneous insertion kits available
- Small hub 2.0 mm and 3.0 mm Sabre
- Small mobile cart with Nano console, Arthrex DualWave pump, and Synergy shaver console
- Peel-pack small joint shaver handpiece



Anterior Ankle Arthroscopy – Establishing Initial Viewing Portal

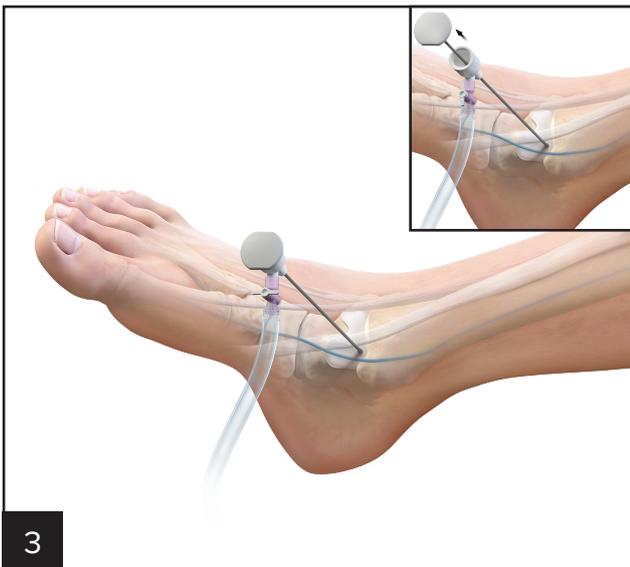


Before establishing portals, it is prudent to mark out relevant anatomy as illustrated.

The AM portal is typically the first portal established. This is located just medial to the tibialis anterior tendon and lateral to the lateral border of the medial malleolus at the level of the ankle joint. It may be helpful to dorsiflex and plantar flex the ankle. This may reveal a soft spot at the joint line to confirm the ideal location of the portal.

Mark out a vertical portal stab incision. To insufflate the joint, angle the needle at 45° in the axial plane, with the ankle dorsiflexed to inject the fluid into the anterior joint and avoid iatrogenic damage to the articular surface. Establish the portal using the sharp trocar and sheath. If a skin incision is desired, a knife blade is provided in the Nano arthroscopy prep kit.

Structures at risk when placing the anteromedial portal are the tibialis anterior tendon laterally and the saphenous vein and nerve medially.



Insert the NanoCannula and sharp trocar, angled 45° to the sagittal plane to enter the anterior ankle joint. If sufficient traction has been applied it will be possible to aim this trocar for the medial gutter to safely insert the instrument into the joint.

Insert the NanoScope™ camera to perform a diagnostic arthroscopy.

Establishing a Working Portal – Anterolateral Portal

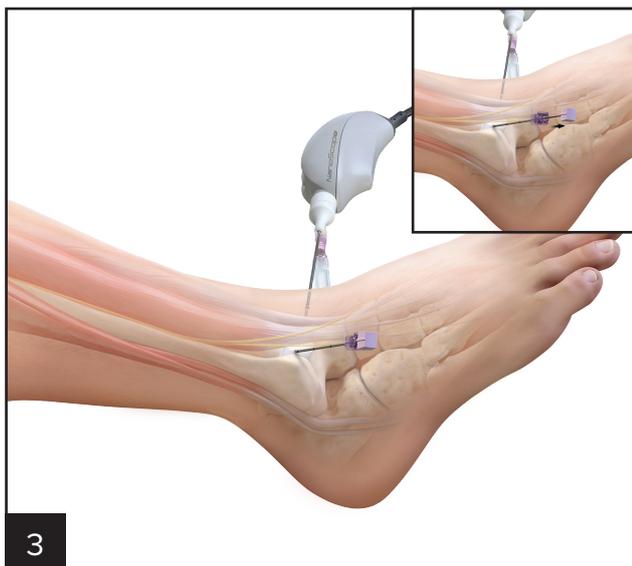


The anterolateral portal should be made at the level of the joint, lateral to the peroneus tertius and the superficial peroneal nerve (SPN).



The SPN can often be identified by plantar flexing and inverting the ankle then passively plantarflexing the 4th toe. The SPN should be marked if visible and avoided. Its position is variable so exercise caution.

Transillumination of the skin using the NanoScope™ camera inserted through the anteromedial portal may be helpful in establishing the anterolateral portal. Alternatively, palpation of the insufflated capsule may reveal a soft spot overlying the appropriate location.



Use a spinal needle from the percutaneous insertion kit to access the joint and confirm the length of the portal using the spinal needle calibrations. Intra-articular visualization of this needle will allow for optimization of portal angle and location.

If a NanoCannula is desired, remove the stylus from the spinal needle and insert the Nitinol wire from the percutaneous insertion kit for use as a switching stick.



Establishing a Working Portal – Anterolateral Portal (Cont.)



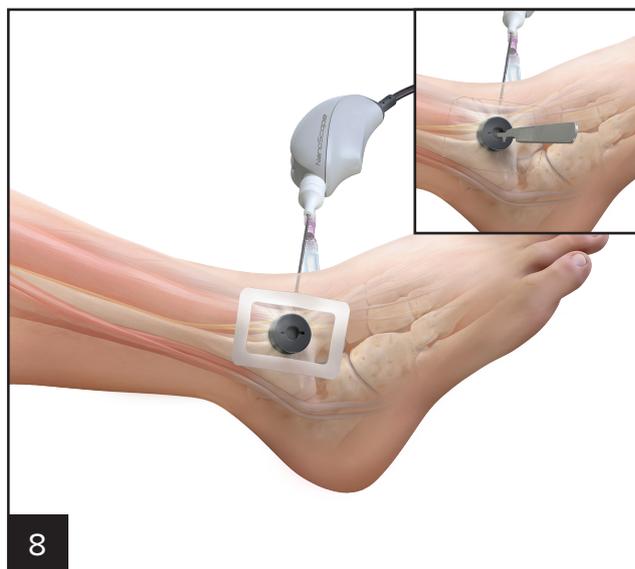
Make a small superficial incision in the skin only. Use blunt dissection to protect the SPN while separating tissues down to the capsule.



Insert the appropriate length NanoCannula over the Nitinol wire.



Remove the cannula obturator and apply the provided Tegaderm™* adhesive to hold the cannula in position. This portal can now be used for instrumentation or as a viewing portal.

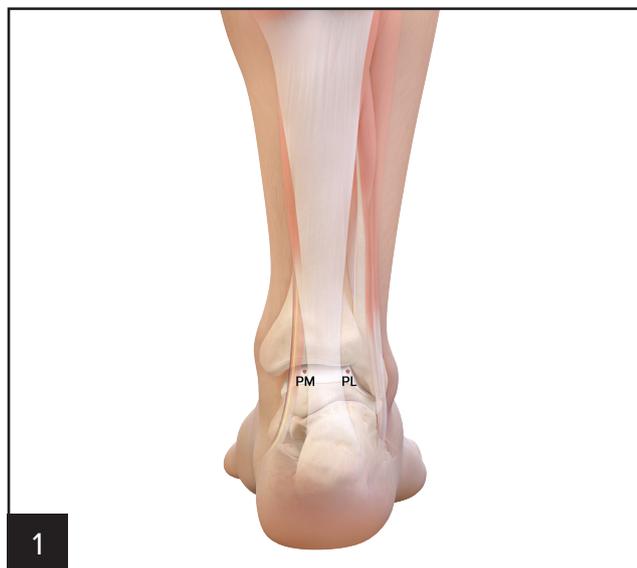


Use a small knife blade to perforate the Tegaderm. This portal is now available to accept all Nano arthroscopy accessory instrumentation.

*Tegaderm is a trademark of 3M Medical.

Posterior Ankle Arthroscopy – Establishing an Initial Viewing Portal and a Working Portal

Posterior ankle arthroscopy is traditionally performed in the prone position. If posterior arthroscopy is to be performed in supine or lateral position, setup and positioning should preserve ample working space behind the ankle to accommodate the NanoScope™ instrumentation.



The posteromedial portal is established just medial to the Achilles tendon, approximately 2 cm above the distal tip of the fibula. If anterior portals have already been established, intra-articular visualization can optimize portal direction and location.



To establish a posterolateral portal, use the percutaneous insertion kit to visualize the appropriate portal trajectory and follow the same procedural steps outlined previously to insert a NanoCannula.

Make a vertical stab incision; use a hemostat to carefully separate the underlying tissue. Use the blunt trocar to perforate the capsule. Insert a cannula with the blunt trocar and leave the cannula in place.

Post Procedure

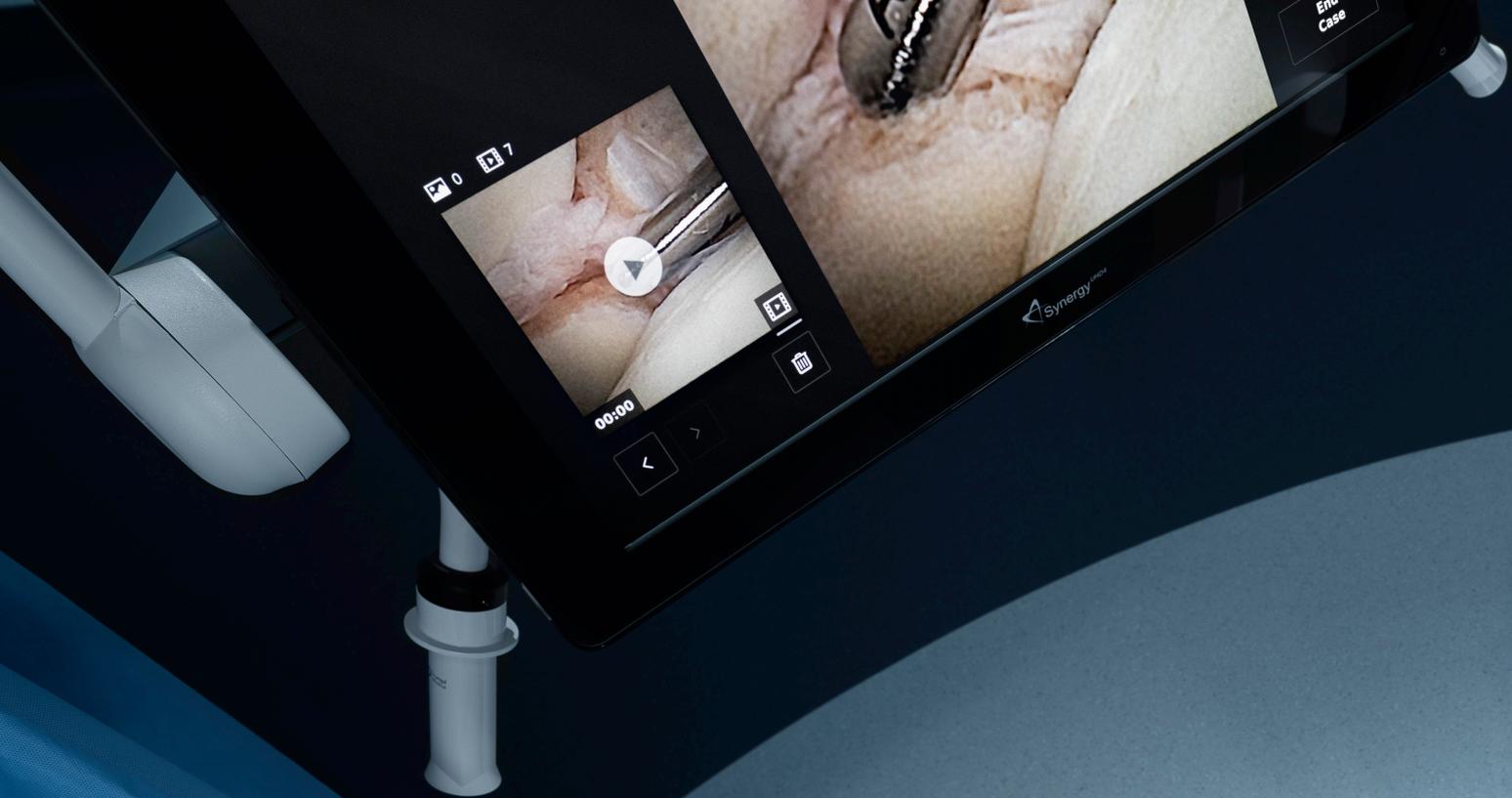
After all of the structures have been thoroughly examined, aspirate the operative saline via the inflow port of the NanoScope sheath. It is important to aspirate as much saline as possible out of the joint prior to procedural completion to limit postoperative pain. The NanoScope camera is then removed from the joint and a sterile compressive dressing is applied.

Ordering Information

Imaging System		
NanoScope™ Tablet Control Unit	13" HD Medical-Grade Imaging Console	AR-3200-0030
NanoScope Camera Head and Cable Kit, single-use	1 Camera, sterile packaged	AR-3210-0040
Mobile Carts		
Synergy MSK™ Ultrasound Cart	Mobile Cart	AR-3502-CRT
NanoScope Console Mount	MSK Cart NanoScope Conversion Kit	ATX-2601
Nano Arthroscopy 2 mm Instrumentation (130 mm Shaft Length)		
NanoBiter, straight	Disposable, sterile packaged, single pack	AR-10911D-1
NanoBiter, 15° Up	Disposable, sterile packaged, single pack	AR-10922D-1
NanoGrasper, straight	Disposable, sterile packaged, single pack	AR-10913D-1
NanoScissor, straight	Disposable, sterile packaged, single pack	AR-10915D-1
Small Joint Probe/NanoProbe	Reusable, single pack	AR-10100N
Nano Arthroscopy 2 mm Instrumentation (70 mm Shaft Length)		
NanoBiter, straight	Disposable, sterile packaged, single pack	AR-10911D-1
NanoBiter, 15° Up	Disposable, sterile packaged, single pack	AR-10902D-1
NanoGrasper, straight	Disposable, sterile packaged, single pack	AR-10903D-1
NanoScissor, straight	Disposable, sterile packaged, single pack	AR-10905D-1
Small Joint Probe/NanoProbe	Reusable, single pack	AR-30000
Patient Prep Kit		
NanoScope Arthroscopy Prep Kit	Disposable, sterile packaged	74312-01M
Tissue and Fluid Outflow Cannula		
Outflow Cannula, Nano arthroscopy	Disposable, sterile packaged	AR-1090S-10
Outflow Cannula, Nano arthroscopy	Disposable, sterile packaged	AR-1090S-70
Fluid Management Pump and Tube Set Options		
DualWave™	Disposable, sterile package	AR-6480
ReDeuce™ Two-Piece Pump Tubing	Disposable, sterile packaged	AR-6411
DualWave Outflow Tubing Set w/ ReDeuce Tubing System	Disposable, sterile packaged	AR-6435
Waste Collection Bag, 10 liters	Disposable, sterile packaged	AR-6431
Gravity Tube Set, 2 spikes, 14.2 ft length	Disposable, sterile packaged	AR-6412
Extension Tube Set	Disposable, sterile packaged	AR-6220
Nano Arthroscopy 2.7 mm Diameter NanoCannula and Insertion Kits		
2.7 mm Cannula and Cannulated Obturator, 1.5 cm length	Disposable, sterile packaged, single pack	AR-1090C-15-1
2.7 mm Cannula and Cannulated Obturator, 3 cm length	Disposable, sterile packaged, single pack	AR-1090C-30-1
2.7 mm Cannula and Cannulated Obturator, 4 cm length	Disposable, sterile packaged, single pack	AR-1090C-40-1
2.7 mm Cannula and Cannulated Obturator, 5 cm length	Disposable, sterile packaged, single pack	AR-1090C-50-1
2.7 mm Cannula and Cannulated Obturator, 7 cm length	Disposable, sterile packaged, single pack	AR-1090C-70-1
Nano Arthroscopy Percutaneous Insertion Kit	Disposable, sterile packaged, single pack	AR-1090PK-1

Ordering Information

Noninvasive Ankle Distractor Set	
NonInvasive Ankle Distractor Set	AR-1713S
Ankle Distraction Strap, nylon (to be used with AR-1713S)	AR-1712
Small Joint Limb Holder	AR-1506
Foam Insert for Small Joint Limb Holder, qty. 5	AR-1507
Small Hub Bladers, Burrs, PowerPick[®] Devices, and PowerRasp[®] Devices	
Sabre, SJ, small hub, 2 mm × 7 cm	AR-9200SR
Sabre, SJ, small hub, 3 mm × 7 cm	AR-9300SR
Sabre, SJ, small hub, 3.5 mm × 7 cm	AR-9350SR
Dissector, SJ, small hub, 3 mm × 7 cm	AR-9300DS
Dissector, SJ, small hub, 3.5 mm × 7 cm	AR-9350DS
Torpedo, SJ, 3.5 mm × 7 cm	AR-9350TD
Burr, oval, 10 flute, SJ, small joint hub, 3 mm × 7 cm	AR-9300OBT
Burr, oval, 10 flute, SJ, small joint hub, 3.5 mm × 7 cm	AR-9350OBT
Burr, round, 10 flute, SJ, small hub, 3 mm × 7 cm	AR-9300RBT
Burr, round, 10 flute, SJ, small hub, 3.5 mm × 7 cm	AR-9350RBT
PowerPick Device, 0°, SJ, small hub, 4 mm drill depth	AR-9100PP-00
PowerPick Device, 45°, SJ, small hub, 4 mm drill depth	AR-9100PP-45
PowerRasp Device, SJ, small hub, 3.5 mm × 7 cm	AR-9350PR
Small Hub Shaver Handpiece	
Shaver Handpiece, small joint, small hub	AR-8330SJ
Small Hub Shaver Handpiece Accessories	
Removable Valve Assembly, reusable (includes O-ring)	AR-8330JV
O-ring, removable valve, reusable, qty. 10/pkg	AR-8330SJO
Large Hub Blades and Burrs	
Sabre, SJ, 2 mm × 7 cm	AR-7200SR
Sabre, SJ, 3 mm × 7 cm	AR-7300SR
Dissector, SJ, 3 mm × 7 cm	AR-7300DS
Torpedo, SJ, 3.5 mm × 7 cm	AR-7350TD
Torpedo, SJ, 4 mm × 7 cm	AR-7400TD
Burr, oval, SJ, 10 flute, 3 mm × 7 cm	AR-7300OBT
Burr, oval, SJ, 10 flute, 4 mm × 7 cm	AR-7400OBT
Burr, round, SJ, 8 flute, 3 mm × 7 cm	AR-7300RBE
Large Hub Shaver Handpiece	
Shaver Handpiece, foot control	AR-8330F
Shaver Handpiece, hand control	AR-8330H
Shaver Handpiece, hand control, backhand	AR-8330RH
Large Hub Shaver Handpiece Accessories	
Removable Valve Assembly, reusable (includes O-ring)	AR-8330V
O-Ring, removable valve, reusable, qty. 10/pkg	AR-8330SJO
Synergy^{Resection™} Shaver System	
Synergy ^{Resection} Shaver Console	AR-8305
APS II Footswitch	AR-8310
Synergy ^{Resection} Wireless Footswitch	AR-8315W







This description of technique is provided as an educational tool and clinical aid to assist properly licensed medical professionals in the usage of specific Arthrex products. As part of this professional usage, the medical professional must use their professional judgment in making any final determinations in product usage and technique. In doing so, the medical professional should rely on their own training and experience and should conduct a thorough review of pertinent medical literature and the product's directions for use. Postoperative management is patient specific and dependent on the treating professional's assessment. Individual results will vary and not all patients will experience the same postoperative activity level or outcomes.

View U.S. patent information at www.arthrex.com/corporate/virtual-patent-marking

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