

Arthrex Beaming System

Surgical Technique



Arthrex Beaming System

Introduction

Device Description

The Arthrex Beaming System is an advanced internal fixation platform designed to provide robust structural support in complex foot and ankle reconstructions. This system uses long, cannulated headless compression beams to span multiple bones to create a rigid internal scaffold, promoting stability and fusion across compromised osseous segments for a plantigrade foot.

Intended Use

The Arthrex Beaming System is intended to be used in the stabilization, reconstruction, and fixation of bone fractures, fusions, osteotomies, and nonunions in the foot and ankle.

Contraindications

1. Insufficient quantity or quality of bone.
2. Blood supply limitations and previous infections, which may retard healing.
3. Foreign body sensitivity. Where material sensitivity is suspected, appropriate tests should be made, and sensitivity ruled out prior to implantation.
4. Any active infection or blood supply limitations.
5. Conditions that tend to limit the patient's ability or willingness to restrict activities or follow directions during the healing period.
6. The use of this device may not be suitable for patients with insufficient or immature bone. The physician should carefully assess bone quality before performing orthopedic surgery on patients who are skeletally immature. The use of this medical device and the placement of hardware or implants must not bridge, disturb, or disrupt the growth plate.
7. Do not use for surgeries other than those indicated.

Fully Threaded

beams increase the surface area for bone interface and reduce the risk of screw cut-out and back-out.¹⁻⁵

Stainless Steel Core

resists elastic deformation 2 times more than titanium alloy. This allows the beam to deform less under a given load, providing a stable environment for bone healing.¹⁻⁵

Headless Taper Design

allows beams to be inserted flush or below the bone surface to minimize soft-tissue irritation or impingement and generate additional compression by acting as a wedge against bone.

Continuous Variable-Pitch

beams apply gradual, constant compression along the entire length of the implant, creating a large compression window. This allows joint compression to occur in multiple segments independently of one another.⁶

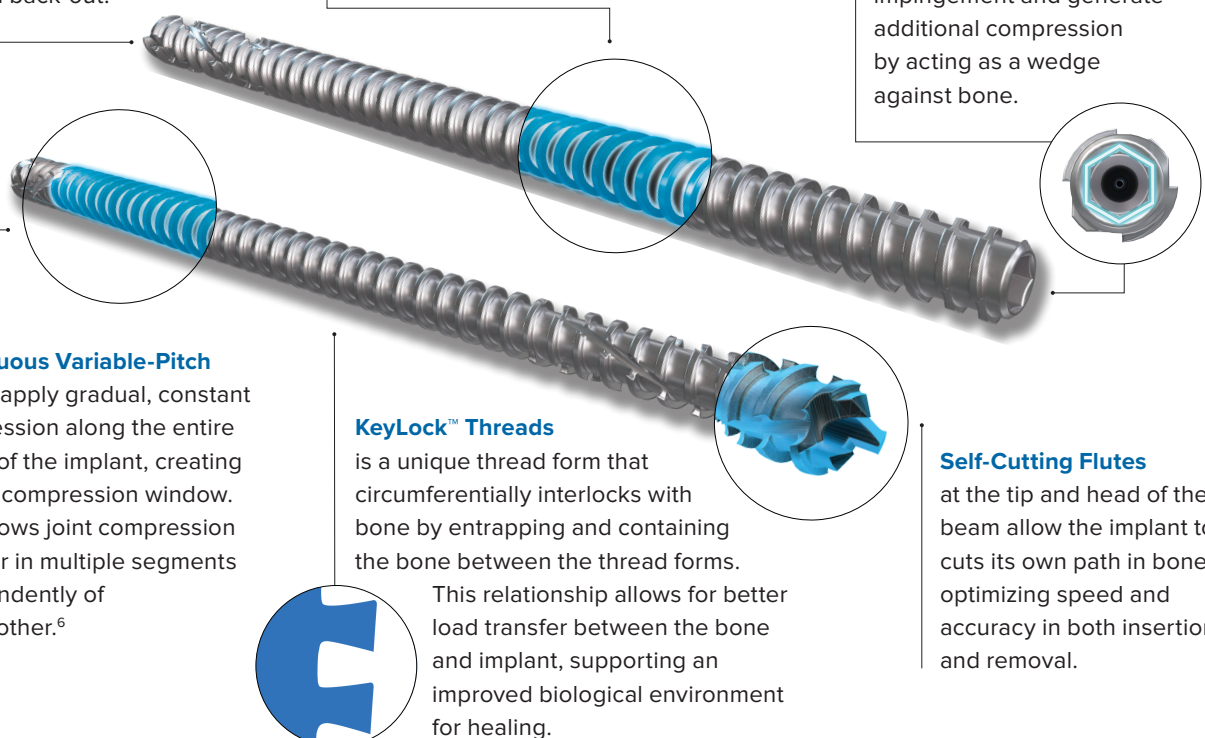
KeyLock™ Threads

is a unique thread form that circumferentially interlocks with bone by entrapping and containing the bone between the thread forms.

This relationship allows for better load transfer between the bone and implant, supporting an improved biological environment for healing.

Self-Cutting Flutes

at the tip and head of the beam allow the implant to cut its own path in bone, optimizing speed and accuracy in both insertion and removal.



Minimally Invasive Joint Preparation

Introduction

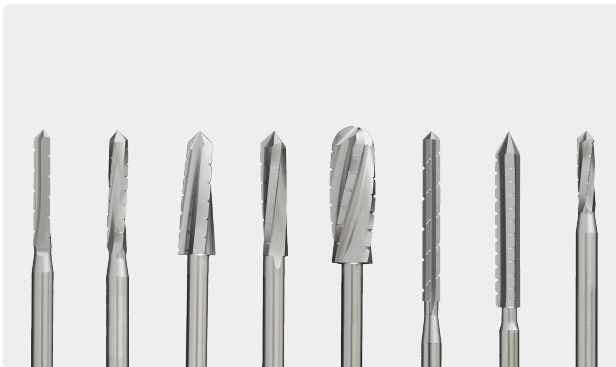
Reconstruction of complex foot and ankle deformities has traditionally relied on open techniques with large incisions for joint preparation and reduction. While open surgery provides excellent visualization, it carries significant risks—wound complications, infection, and delayed healing—especially in patients with diabetes or poor soft tissue.

Minimally invasive techniques offer a compelling alternative. By using small, targeted incisions and percutaneous instrumentation, minimally invasive surgery (MIS) preserves soft tissue, reduces wound breakdown, and lowers infection risk. Additional benefits may include shorter operative times, less blood loss, and potentially faster recovery and earlier weight-bearing. MIS also minimizes disruption to vascular supply, which is critical in neuropathic patients, and may reduce hospital stay and overall cost.



Arthrex MIS Console

This allows for joint preparation and percutaneous osteotomies of the foot and ankle using low-speed, high-torque burrs with continuous irrigation. The system is specifically designed for foot and ankle procedures and allows users to adjust motor parameters like speed, torque, flow rate, and transmission ratio.



Arthrex Percutaneous Burrs

Specialized for specific foot and ankle procedures, these burrs are available in different shapes, diameters, lengths, and flutes to allow surgeons to perform osteotomies, remove cartilage, fenestrate, conduct fine bone work, and sculpt bone.



MIS Elevators

These slim, contoured, and low-profile instruments are designed to work through small incisions to create a safe working portal for burring and cutting. They help maintain periosteal integrity, protect neurovascular structures, reduce the need for aggressive manual retraction, and lower wound complications.

Beaming Surgical Technique



1

Place the patient in the supine position with the operative leg positioned beyond the end of the table, allowing sufficient space for image intensifier, axial alignment views, and subtalar screws.

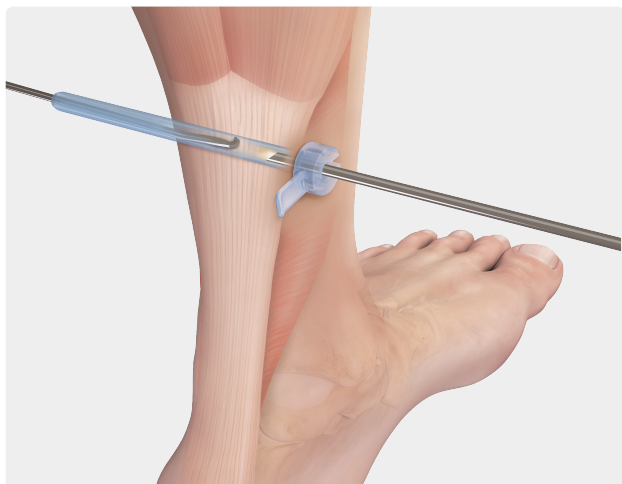
Place a small bump under the hip of the operative extremity for neutral foot alignment, and apply a nonsterile tourniquet at the level of the thigh.



2

A large C-arm is recommended for these procedures, with the image intensifier positioned at the edge of the bed.

Introduce the C-arm from the side opposite the operative extremity to optimize imaging and access.



3

Assess the Achilles tendon for contracture. A percutaneous Achilles tendon lengthening or gastrocnemius recession should be considered.

Note: Ensure that the patella is exposed for assessment of rotational alignment.



4

Perform osteotomies as needed to correct the deformity and realign the bones as needed. A biplanar osteotomy consisting of a medial-based closing wedge osteotomy and a plantar flexion osteotomy is often required to achieve a plantigrade foot.

Corrective osteotomies may be performed using an open or MIS approach.

Use 1.6 mm K-wires (AR-8941K) to provisionally hold the foot in proper neutral plantigrade position. Consider the planned placement of the final fixation when positioning the temporary wires.



5

Create separate 5 mm stab incisions at the level of each joint using a knife or beaver blade. When joint fusion is intended, resect and prepare the joint whenever possible.

Perform soft-tissue dissection down to bone using a small hemostat and periosteal elevator, taking care to identify and protect the anterior tibial tendon.



6

Introduce MIS burrs through the incision to denude the cartilage and prepare the joint for arthrodesis.

Confirm adequate joint preparation using multiple fluoroscopic views.

Flush cartilage and bone debris from the joint with normal saline using an angiocatheter or an 18-gauge needle and syringe.

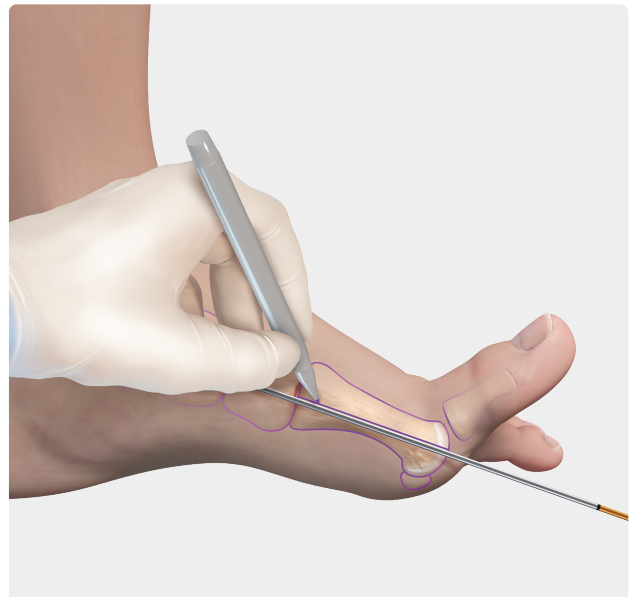
Fenestration of the subchondral plate can be performed to increase osseous perfusion for further consolidation.



7

Injectable bone allograft can be delivered through the stab incisions to assist with bony healing and fusion.

Radiopaque bone grafts are particularly useful in MIS fusion procedures to ensure proper placement and delivery via fluoroscopy.



8

Under fluoroscopic guidance, mark out the talonavicular, naviculocuneiform, and tarsometatarsal joints on the skin.

Use a K-wire to mark the longitudinal axis of the medial column in both the lateral and AP views.



9

With the hallux in slight dorsiflexion, create a 5 mm stab incision over the plantar aspect of the hallux metatarsophalangeal (MTP) joint—between the sesamoids.

Alternatively, expose the MTP joint by making a dorsal incision. Continuously perform soft-tissue releases until the hallux can be plantar flexed by 90°.

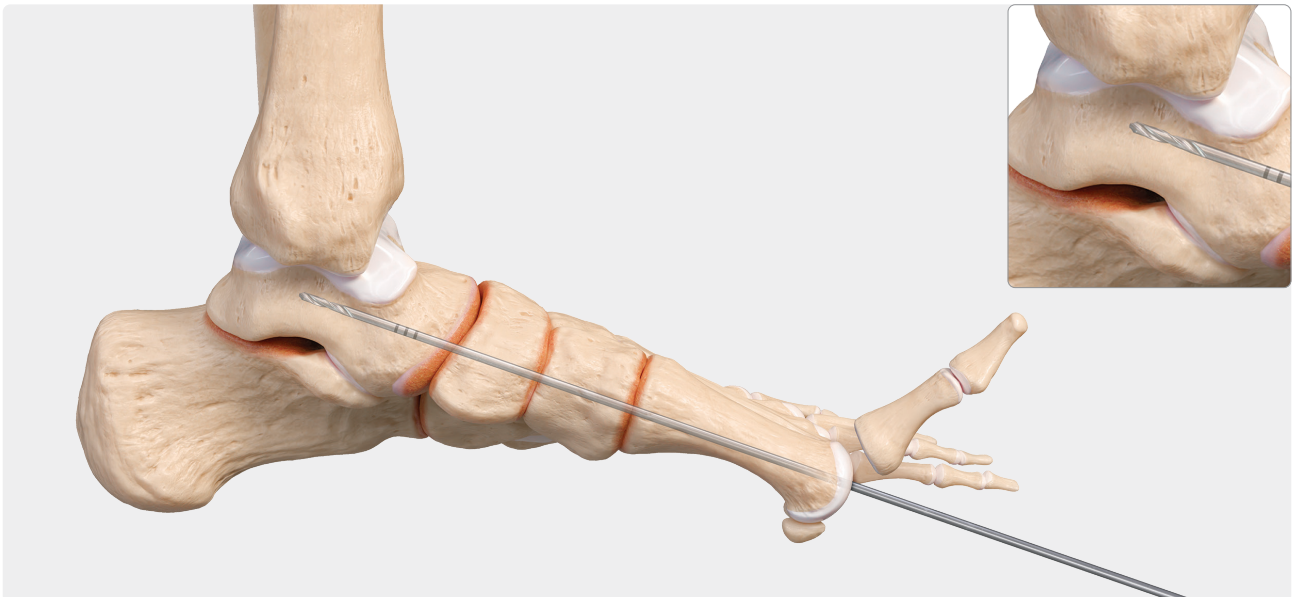


10

Select the appropriate-size K-wire for the final beam fixation size and insert it through the articular surface of the 1st metatarsal. A K-wire guide may be used if desired.

Alternatively, use a soft-tissue retractor (eg, Senn) for better visibility and access to the surgical site.

Beam Size	K-Wire Size	K-Wire Part Number
5	1.8 mm	AR-9001B-1
6	2.2 mm	AR-9001B-2
7/8	2.4 mm	AR-9001B-3

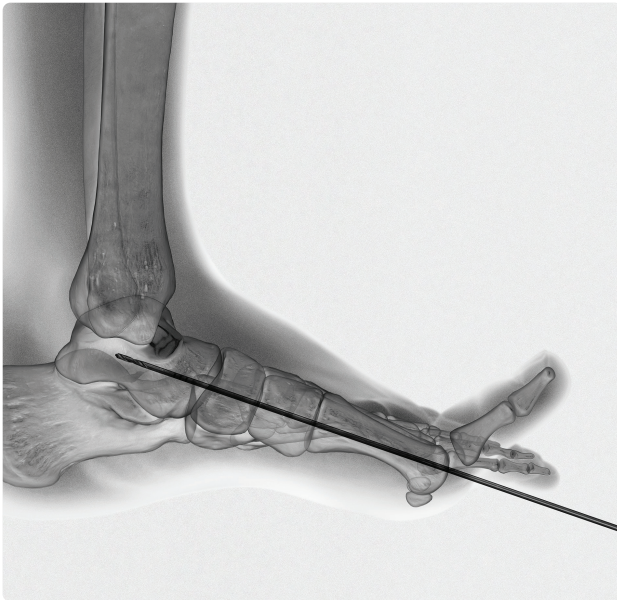


11

Advance the K-wire through the intramedullary canal, following the trajectory through the cuneiform, navicular, and into the talus.

Keep in mind that minor changes in the angulation of the wire distally can substantially affect the proximal position in the talus.

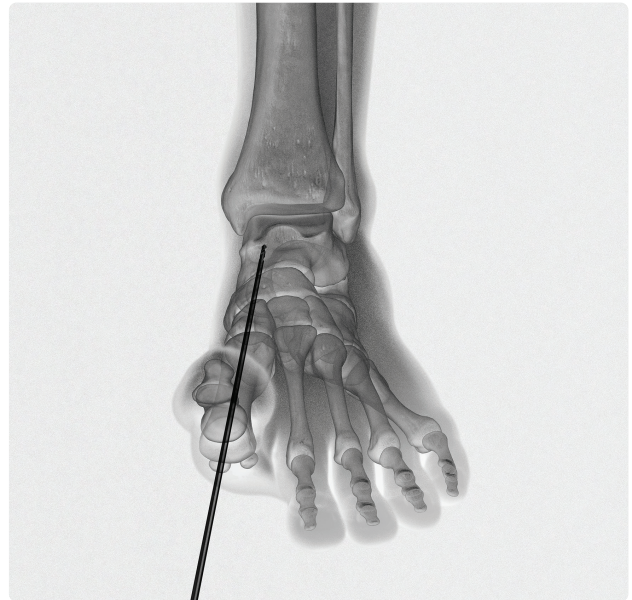
Use fluoroscopic guidance to advance the K-wire until the tip reaches the desired implant position in the talus.



12

On the lateral view, start the K-wire slightly superior to the center of the metatarsal head and angle it toward the center of the talar body.

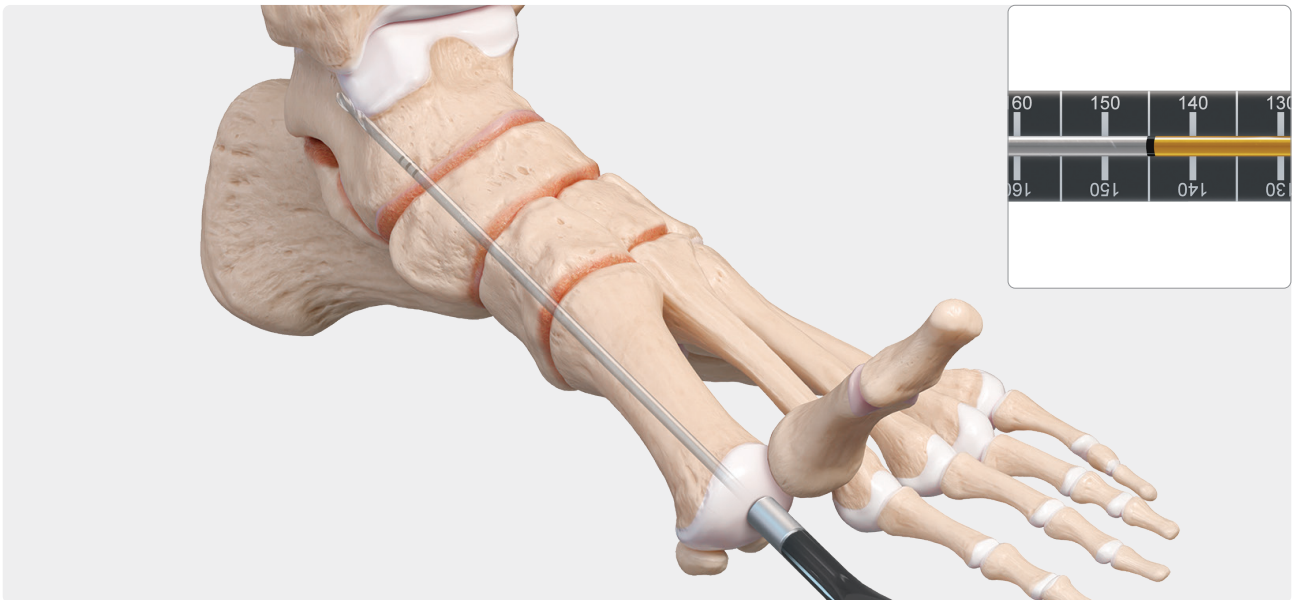
Avoid penetrating the posterior cortex with the K-wire.



13

On the ankle AP view, advance the K-wire so it bisects the sesamoids and ends in the medial third of the talus.

This trajectory preserves sufficient real estate for placement of the subtalar screw, if desired.



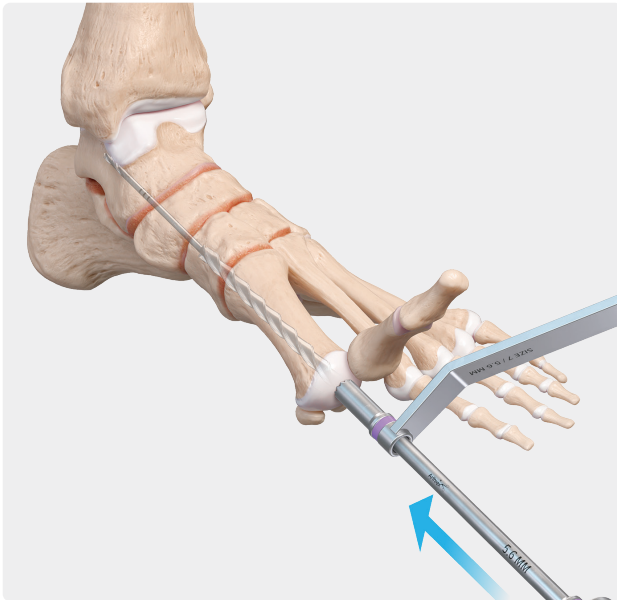
14

Place the depth gauge (AR-9001B-25) over the K-wire and slide it down to the surface of the metatarsal.

Read the appropriate length from the depth gauge graduations.

Note: Implant length is determined by reading off the laser marking line at the transition from silver to gold and not at the end of the K-wire.

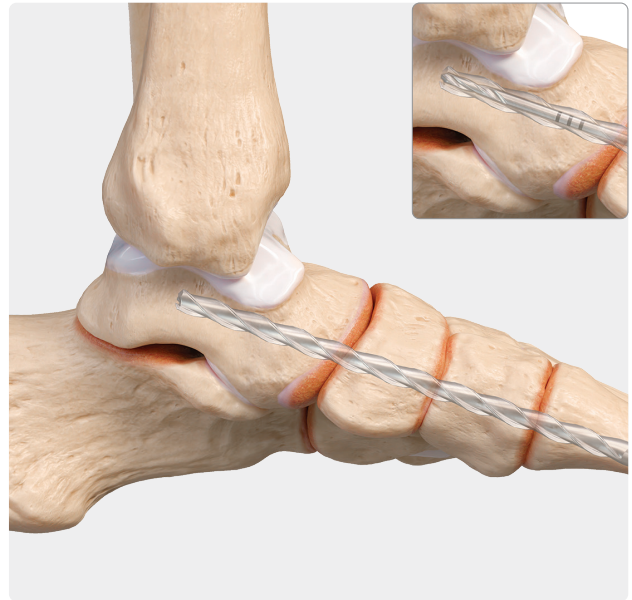
Note: If countersinking the implant into the metatarsal canal, subtract the countersink depth from the reading of the depth gauge.



15

Predrill over the K-wire using the appropriate drill. A tissue protector may be used if desired.

Beam Size	Drill Size	Drill Part Number
5	3.6 mm	AR-9001B-4
6	4.5 mm	AR-9001B-5
7	5.6 mm	AR-9001B-6
8	6.5 mm	AR-9001B-7

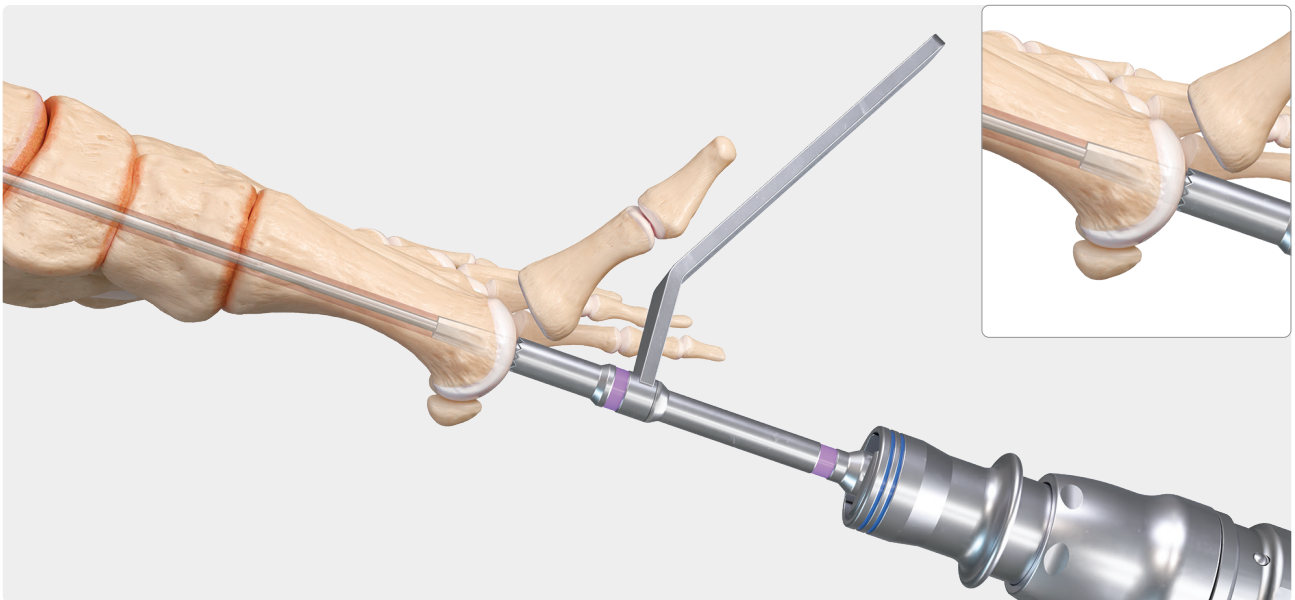


16

Use fluoroscopy to ensure that the drill is not advanced further than the K-wire.

Remove the drill and leave the K-wire in place.

Note: If desired, the K-wire can be advanced further into the talar bone prior to removing the drill to prevent wire entrapment and extraction with the drill.

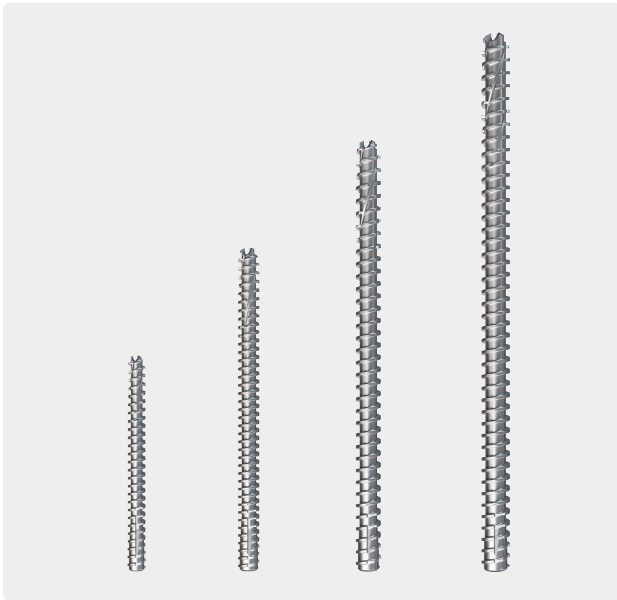


17

If desired, use the appropriately sized profile drill over the K-wire to prepare the bone for the final implant.

If using the tissue protector, bottom out the profile drill onto the back end of the tissue protector. Without the tissue protector, advance the profile drill to the level of the laser marking line.

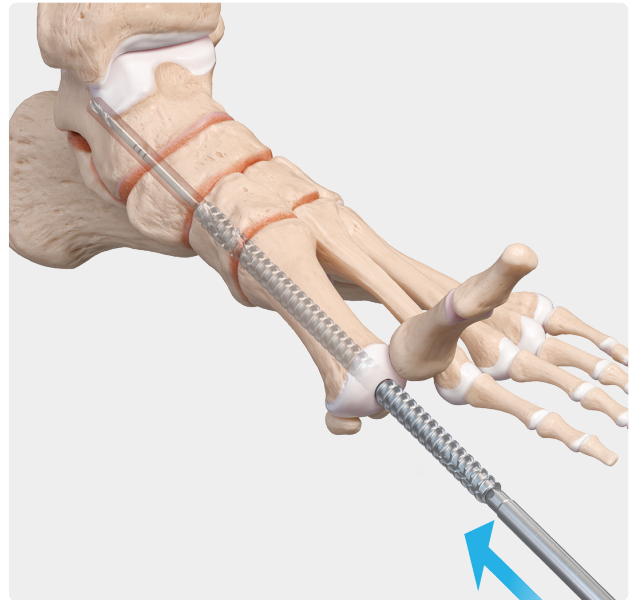
Beam Size	Profile Drill Size	Profile Drill Part Number
5	Size 5	AR-9001B-8
6	Size 6	AR-9001B-9
7	Size 7	AR-9001B-10
8	Size 8	AR-9001B-11



18

Select the appropriate-size diameter and length of the final implant.

Beam Diameter	Beam Length	Beam Part Number
5	50-120	AR-9001A-5XXX
6	50-120	AR-9001A-6XXX
7	50 -170	AR-9001A-7XXX
8	50-170	AR-9001A-8XXX



19

Using the corresponding appropriately sized driver, insert the Arthrex beam over the K-wire, ensuring the head of the beam is seated below the articular surface of metatarsal bone.

The beam may be inserted under power or using the T-handle (AR-9091-32). Final seating of the implant should be completed by hand.

Beam Size	Driver Size	Driver Part Number
5	3.0 Hex	AR-9001B-12
6	3.5 Hex	AR-9001B-13
7	4.0 Hex	AR-9001B-14
8	4.5 Hex	AR-9001B-30



20

The final implant position demonstrates appropriate depth and trajectory, with the beam seated securely across the medial column to provide rigid fixation without cortical breach. Radiographic evaluation confirms accurate placement, maintaining anatomic alignment and supporting midfoot stability.



21



22

Repeat the surgical steps for each subsequent beam placement to address the subtalar joint, calcaneocuboid joint, and lesser metatarsals.

Position each screw to reinforce the structural integrity of the construct and support biomechanical function across the midfoot and hindfoot.



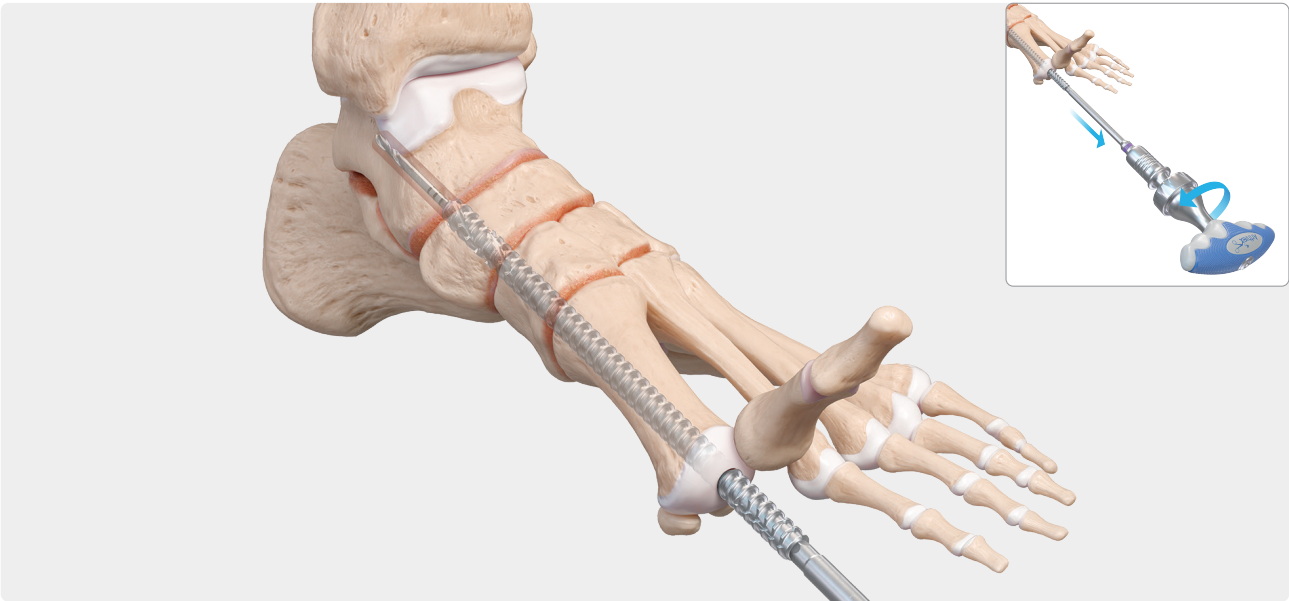
23

After completing fixation, irrigate the site thoroughly to remove all debris. Close the soft-tissue layers in an anatomical fashion while ensuring hemostasis. Finally, apply a sterile dressing and immobilize the limb as needed to protect the surgical site.



24

Explant Information



1

For beam removal, first review imaging to confirm screw location, orientation, and surrounding anatomy. Next, make a precise incision directly over the beam head. Dissect through the soft-tissue layers to expose the beam head, taking care to remove any fibrous tissue or bone overgrowth. Engage the beam with the appropriately sized solid driver. Then apply steady, controlled torque to back the beam out.

Beam Size	Driver Size	Driver Part Number
5	3.0 Hex	AR-9001B-15
6	3.5 Hex	AR-9001B-16
7	4.0 Hex	AR-9001B-17
8	4.5 Hex	AR-9001B-31

Biologic Augmentation Options



JumpStart® Antibacterial Wound Dressing

This microcurrent-generating wound dressing is designed to support the body's natural healing process and provide protection against a broad spectrum of bacteria. It is indicated for surgical incision sites, but can also be used for partial and full thickness wounds—pressure ulcers, diabetic ulcers, and donor graft sites. The dressings are available in a number of sizes, can be directly placed over sutures, and work with secondary dressings.



Arthrex Calcium Sulfate BioBeads

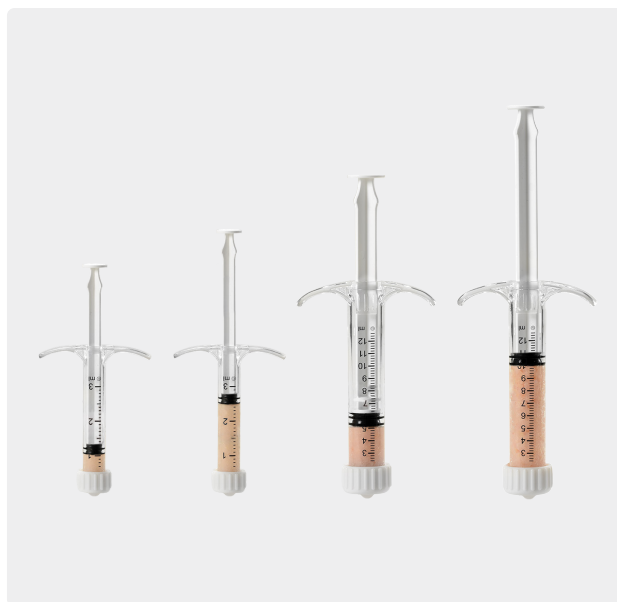
These pure synthetic calcium sulfate bone void fillers (non-load-bearing) are designed to be reabsorbed over time and replaced by the patient's own bone. In addition, they are indicated for use in infected bone sites.

The kit allows for the creation of beads in different sizes or can be delivered in a paste configuration to match the defect shape.



AlloSync™ Pure

This demineralized bone matrix is derived from 100% human allograft. It has no extrinsic carriers and retains native growth factors to help stimulate bone formation. Available ready to use in multiple sizes, users can adjust its viscosity for injection or putty-like performance. AlloSync Pure can be hydrated with biologic fluids (bone marrow aspirate, platelet-rich plasma, blood, saline) and shaped in a fluid environment.



ArthroCell™ Plus

This viable allograft bone matrix contains mesenchymal stem cells, a blend of cortical and cancellous fiber scaffold, and a handling gel to promote bone regeneration.

It is delivered in premixed syringes in multiple size ranges for seamless graft delivery.



Interfyl® Matrix

This decellularized human placental allograft is designed to replace or supplement damaged integumental tissue. It is available in both a flowable and particulate form and is used to fill soft-tissue deficits or irregular spaces caused by deep dermal wounds, tunneling wounds, fistula tracts, and dermal undermining.



ArthroFLEX® Dermal Allograft

This decellularized dermal allograft is a skin substitute or internal reinforcement for severe soft-tissue wounds, such as diabetic foot ulcers. It provides a clean matrix of collagen, elastin, and growth factors to rebuild tissue and acts as a protective covering for surgical and deep wounds.

ArthroFlex is a registered trademark of LifeNet Health.

Ordering Information



Arthrex Beams

5 mm	
5 mm × 50 mm	AR-9001A-550C
5 mm × 55 mm	AR-9001A-555C
5 mm × 60 mm	AR-9001A-560C
5 mm × 65 mm	AR-9001A-565C
5 mm × 70 mm	AR-9001A-570C
5 mm × 75 mm	AR-9001A-575C
5 mm × 80 mm	AR-9001A-580C
5 mm × 85 mm	AR-9001A-585C
5 mm × 90 mm	AR-9001A-590C
5 mm × 95 mm	AR-9001A-595C
5 mm × 100 mm	AR-9001A-5100C
5 mm × 105 mm	AR-9001A-5105C
5 mm × 110 mm	AR-9001A-5110C
5 mm × 115 mm	AR-9001A-5115C
5 mm × 120 mm	AR-9001A-5120C



Arthrex Beams

6 mm	
6 mm × 50 mm	AR-9001A-650C
6 mm × 55 mm	AR-9001A-655C
6 mm × 60 mm	AR-9001A-660C
6 mm × 65 mm	AR-9001A-665C
6 mm × 70 mm	AR-9001A-670C
6 mm × 75 mm	AR-9001A-675C
6 mm × 80 mm	AR-9001A-680C
6 mm × 85 mm	AR-9001A-685C
6 mm × 90 mm	AR-9001A-690C
6 mm × 95 mm	AR-9001A-695C
6 mm × 100 mm	AR-9001A-6100C
6 mm × 105 mm	AR-9001A-6105C
6 mm × 110 mm	AR-9001A-6110C
6 mm × 115 mm	AR-9001A-6115C
6 mm × 120 mm	AR-9001A-6120C



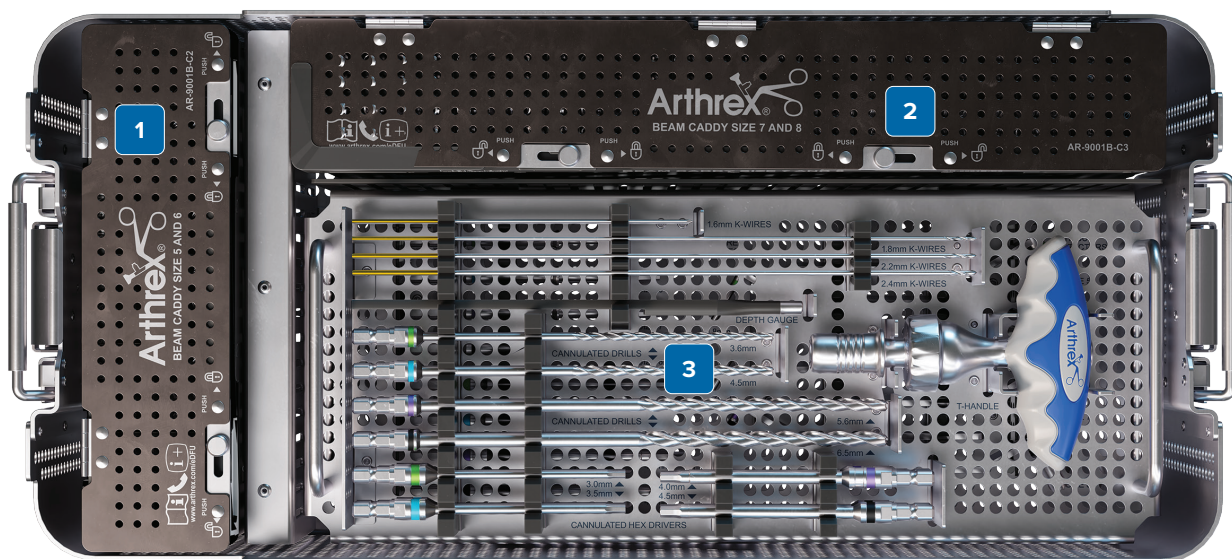
Arthrex Beams

7 mm	
7 mm × 50 mm	AR-9001A-750C
7 mm × 55 mm	AR-9001A-755C
7 mm × 60 mm	AR-9001A-760C
7 mm × 65 mm	AR-9001A-765C
7 mm × 70 mm	AR-9001A-770C
7 mm × 75 mm	AR-9001A-775C
7 mm × 80 mm	AR-9001A-780C
7 mm × 85 mm	AR-9001A-785C
7 mm × 90 mm	AR-9001A-790C
7 mm × 95 mm	AR-9001A-795C
7 mm × 100 mm	AR-9001A-7100C
7 mm × 105 mm	AR-9001A-7105C
7 mm × 110 mm	AR-9001A-7110C
7 mm × 115 mm	AR-9001A-7115C
7 mm × 120 mm	AR-9001A-7120C
7 mm × 125 mm	AR-9001A-7125C
7 mm × 130 mm	AR-9001A-7130C
7 mm × 135 mm	AR-9001A-7135C
7 mm × 140 mm	AR-9001A-7140C
7 mm × 145 mm	AR-9001A-7145C
7 mm × 150 mm	AR-9001A-7150C
7 mm × 155 mm	AR-9001A-7155C
7 mm × 160 mm	AR-9001A-7160C
7 mm × 165 mm	AR-9001A-7165C
7 mm × 170 mm	AR-9001A-7170C

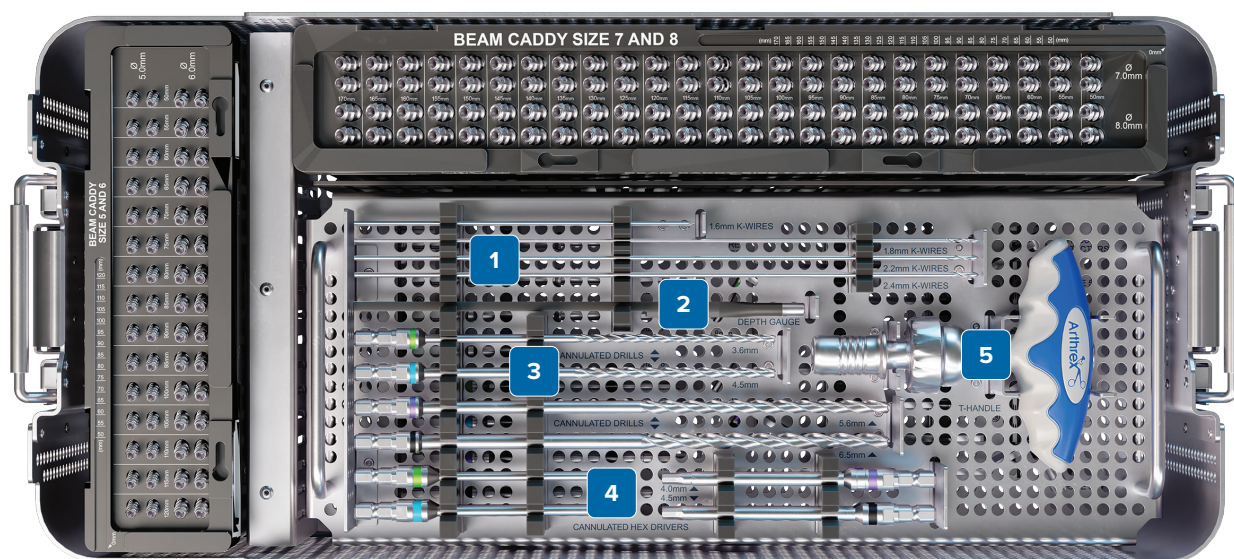


Arthrex Beams

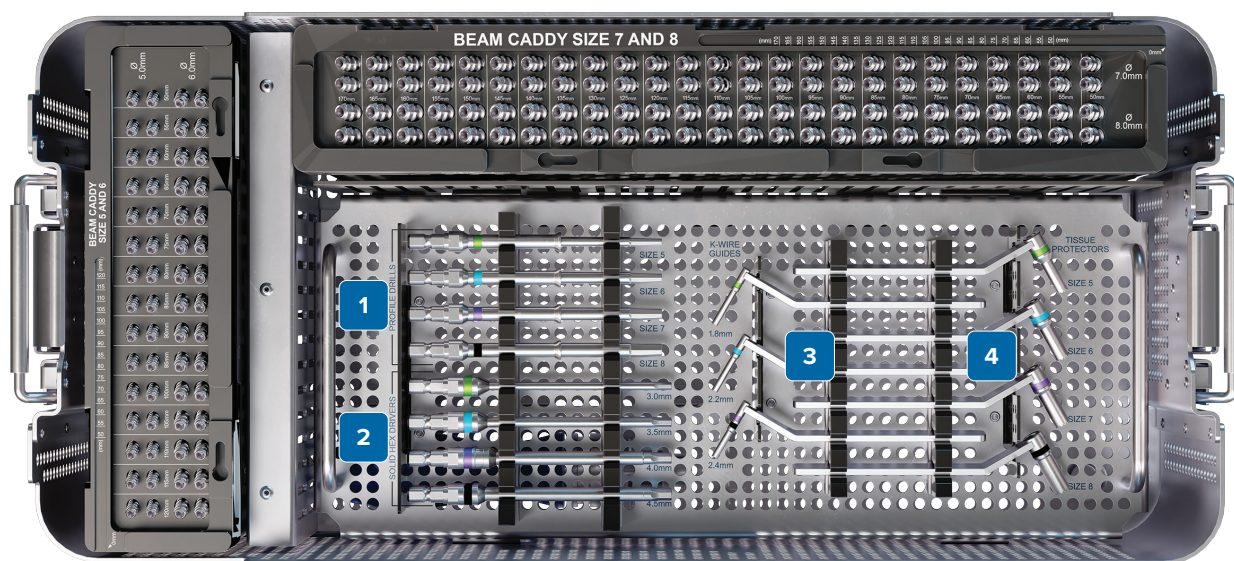
8 mm	
8 mm × 50 mm	AR-9001A-850C
8 mm × 55 mm	AR-9001A-855C
8 mm × 60 mm	AR-9001A-860C
8 mm × 65 mm	AR-9001A-865C
8 mm × 70 mm	AR-9001A-870C
8 mm × 75 mm	AR-9001A-875C
8 mm × 80 mm	AR-9001A-880C
8 mm × 85 mm	AR-9001A-885C
8 mm × 90 mm	AR-9001A-890C
8 mm × 95 mm	AR-9001A-895C
8 mm × 100 mm	AR-9001A-8100C
8 mm × 105 mm	AR-9001A-8105C
8 mm × 110 mm	AR-9001A-8110C
8 mm × 115 mm	AR-9001A-8115C
8 mm × 120 mm	AR-9001A-8120C
8 mm × 125 mm	AR-9001A-8125C
8 mm × 130 mm	AR-9001A-8130C
8 mm × 135 mm	AR-9001A-8135C
8 mm × 140 mm	AR-9001A-8140C
8 mm × 145 mm	AR-9001A-8145C
8 mm × 150 mm	AR-9001A-8150C
8 mm × 155 mm	AR-9001A-8155C
8 mm × 160 mm	AR-9001A-8160C
8 mm × 165 mm	AR-9001A-8165C
8 mm × 170 mm	AR-9001A-8170C



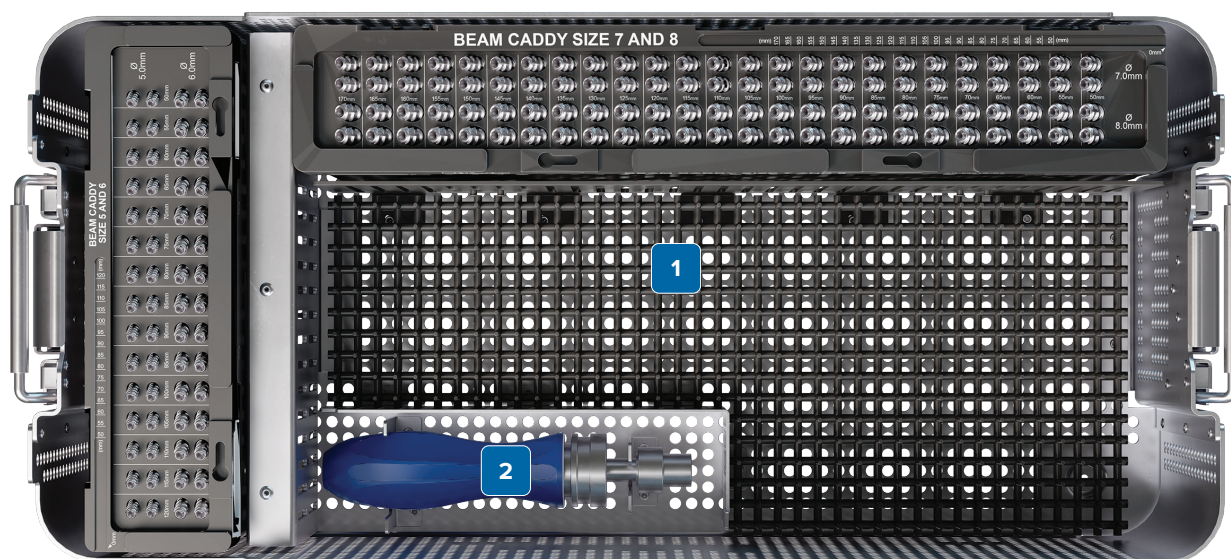
Location	Description
1	Size 5 and 6 beam caddy
2	Size 7 and 8 beam caddy
3	Instrument



Location	Item Number	Qty.	Description
1	AR-8941K	12	K-wire, 1.6 × 100 mm
1	AR-9001B-1	6	K-wire, 1.8 × 275 mm
1	AR-9001B-2	6	K-wire, 2.2 × 275 mm
1	AR-9001B-3	6	K-wire, 2.4 × 275 mm
2	AR-9001B-25	1	Depth gauge
3	AR-9001B-4	2	Drill, cannulated, 3.6 mm
3	AR-9001B-5	2	Drill, cannulated, 4.5 mm
3	AR-9001B-6	2	Drill, cannulated, 5.6 mm
3	AR-9001B-7	2	Drill, cannulated, 6.5 mm
4	AR-9001B-12	2	Driver, cannulated, hex, 3.0 mm
4	AR-9001B-13	2	Driver, cannulated, hex, 3.5 mm
4	AR-9001B-14	2	Driver, cannulated, hex, 4.0 mm
4	AR-9001B-30	2	Driver, cannulated, hex, 4.5 mm
5	AR-9091-32	1	Ratcheting T-handle



Location	Item Number	Qty.	Description
1	AR-9001B-8	1	Profile drill, size 5
1	AR-9001B-9	1	Profile drill, size 6
1	AR-9001B-10	1	Profile drill, size 7
1	AR-9001B-11	1	Profile drill, size 8
2	AR-9001B-15	1	Driver, solid, hex, 3.0 mm
2	AR-9001B-16	1	Driver, solid, hex, 3.5 mm
2	AR-9001B-17	1	Driver, solid, hex, 4.0 mm
2	AR-9001B-31	1	Driver, solid, hex, 4.5 mm
3	AR-9001B-18	1	K-wire guide, 1.8 mm
3	AR-9001B-19	1	K-wire guide, 2.2 mm
3	AR-9001B-20	1	K-wire guide, 2.4 mm
4	AR-9001B-21	1	Tissue protector, size 5
4	AR-9001B-22	1	Tissue protector, size 6
4	AR-9001B-23	1	Tissue protector, size 7
4	AR-9001B-24	1	Tissue protector, size 8



Location	Item Number	Qty.	Description
1	N/A	1	Finger mat
2	AR-1999HH	1	Ratcheting handle

General Instrumentation*

Hinterman distractor	AR-8948CD
Mini joint compressor/distractor	AR-8970JD
Traction post, threaded, 2.4 mm	AR-8970JD-24S
Traction post, threaded, 3.0 mm	AR-8970JD-30S
Guide wire plunger	AR-8737-56
McGlamry elevator, 11 mm	AR-8930M
McGlamry elevator, 13 mm	AR-8944M
Laminar spreader	

*Not available in the set but may be helpful for joint preparation, alignment, and/or surgical workflow.

References

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3. Wukich DK, Liu GT, Raspovic K, Vicenzi F. Biomechanical performance of Charcot-specific implants. *J Foot Ankle Surg.* 2021;60(3):440-447. doi:10.1053/j.jfas.2020.05.016
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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.



Arthrex manufacturer, authorized representative, and importer information (Arthrex eIFUs)



US patent information