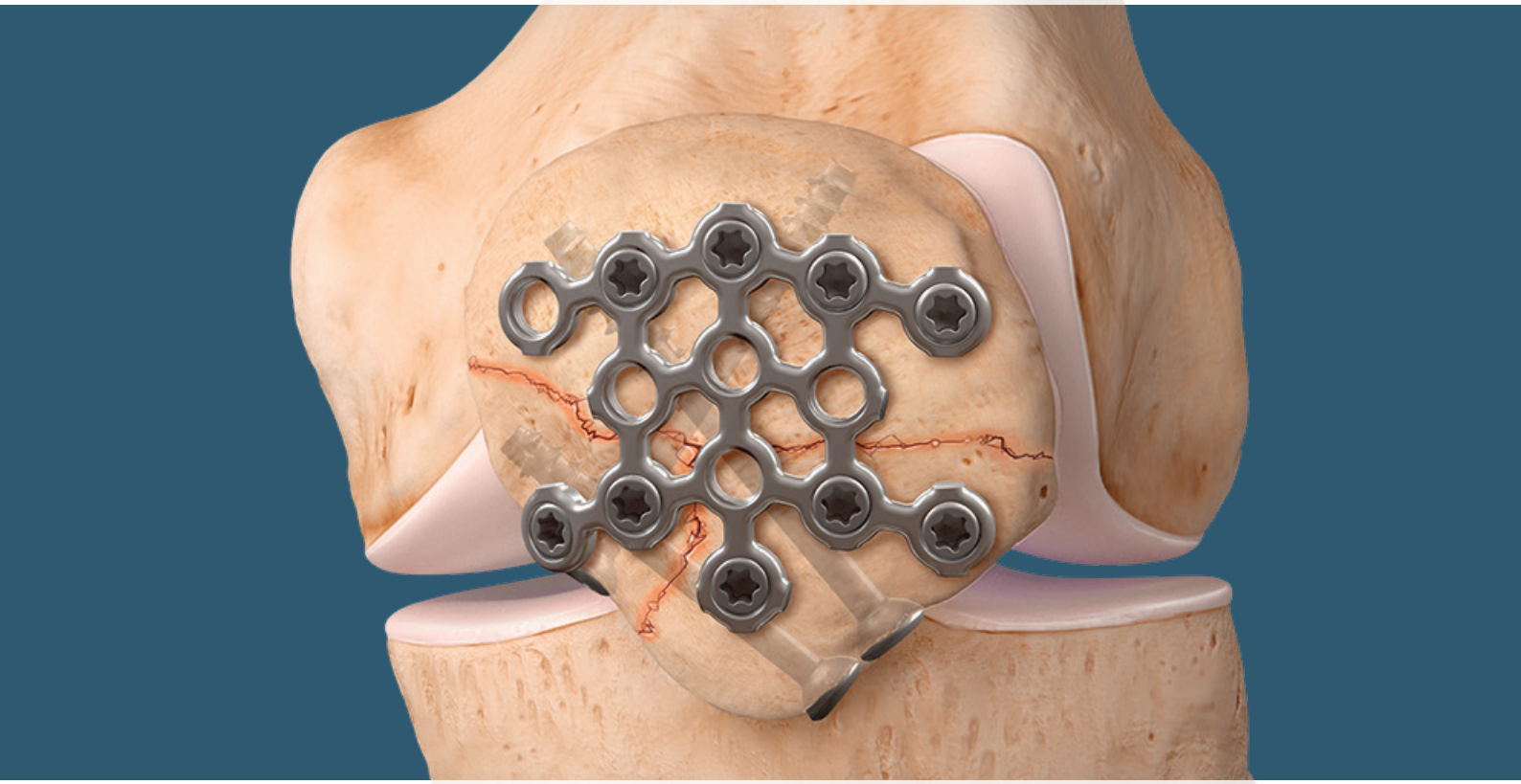
Mesh Plating for Patella Fractures

Surgical Technique



Arthrex®

Mesh Plating for Patella Fractures

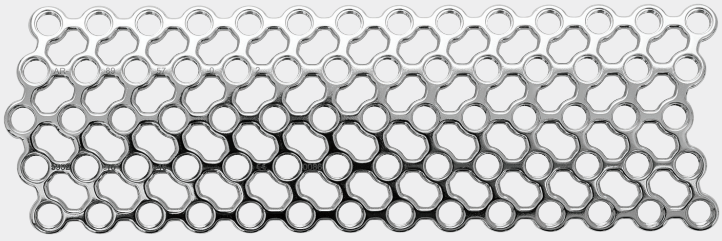
Introduction

The Arthrex mesh plate is the first FDA-cleared plate for patella fracture indications in the United States.

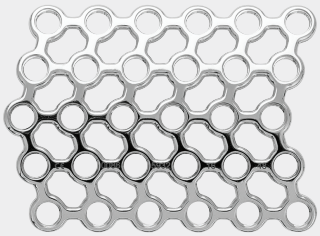
Patella fractures represent approximately 1% of all fractures[1] and present a variety of fracture patterns, which can make osteosynthesis challenging. These fractures are the most common cause of disruption of the extensor mechanism and can result from direct, indirect, or combined trauma.[2] The amount of comminution, degree of osteoporosis, and the natural forces across the patella create obstacles for reduction and adequate stabilization.

Studies have shown significantly higher patellar stability and osteosynthesis rates with locked plates.[1] Used in conjunction with the Patella Fracture Set, the Arthrex mesh plates can facilitate the fixation needs of these frequently challenging injuries. The 4.0 mm blunt-tip cannulated lag screws can be used with FiberTape® suture to create tension-band fixation or cannulated lag screws can be used with the stainless steel or titanium mesh plate to provide stable fixation for comminuted fracture patterns. Arthrex mesh plates are offered in standard and short lengths and surgeons may cut the plates to the desired size and shape for the fracture.

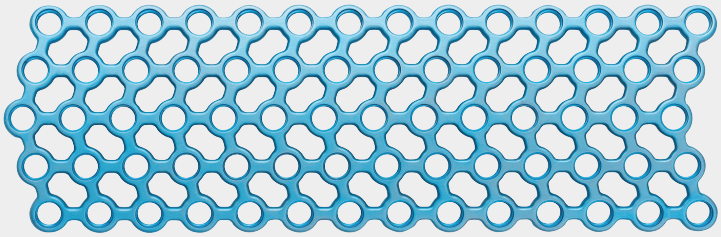
Plate Features



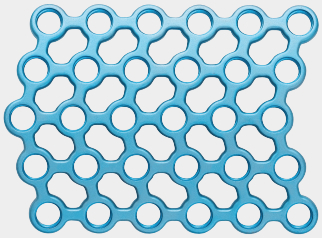
Stainless Steel Mesh Plate, long



Stainless Steel Mesh Plate, short



Titanium Mesh Plate, long



Titanium Mesh Plate, short

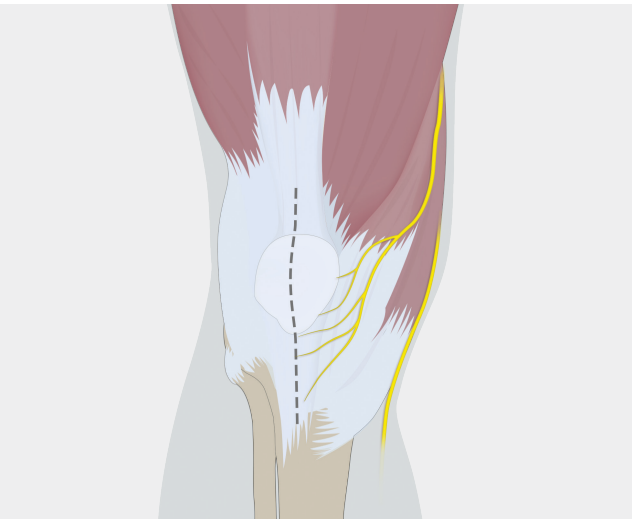
The Arthrex mesh plates are available in standard and short lengths. Surgeons can cut the plates to size to fit the specific fracture. Bending irons can be used to contour the plate to the patient's anatomy. The stainless steel plates use 2.7 mm locking and nonlocking screws, while the titanium plates use 3.0 mm locking and nonlocking screws. The areas between screw fixation can be used as reattachment points for soft tissue or ligament bracing. In addition to the plate, a 4.0 mm blunt-tipped cannulated lag screw can be used to apply compression to patellar fragments.

Patient Positioning

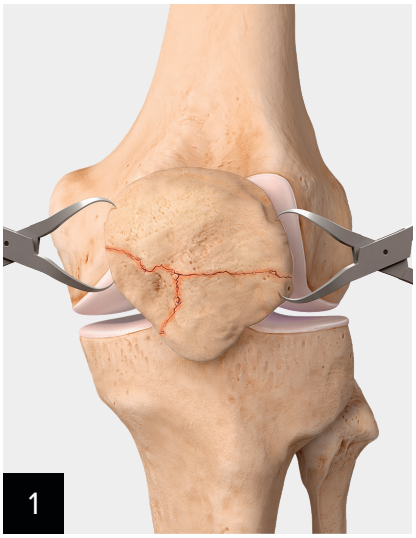
The patient is in supine position with the operated leg prepped and draped.

Surgical Approach

The paramedian/median approach (analogous to the approach in knee replacement), starting cranial to the patella and running centrally to the region of the tibial tubercle is a standard approach. Deep dissection involving the medial or lateral retinacula may be necessary to facilitate anatomic reduction of the articular surface.



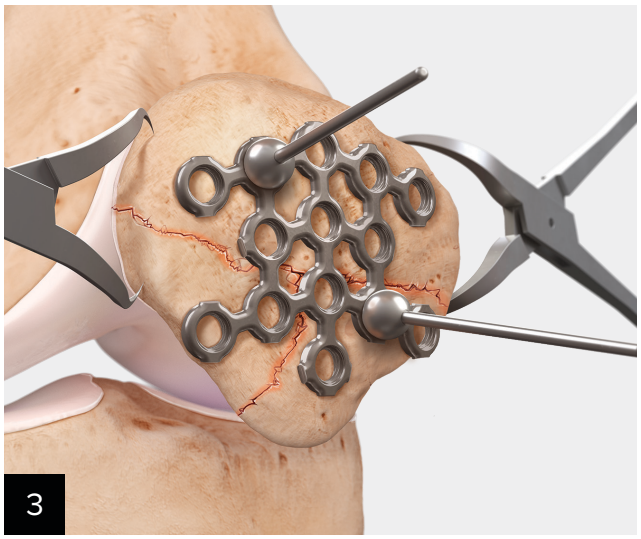
Surgical Technique



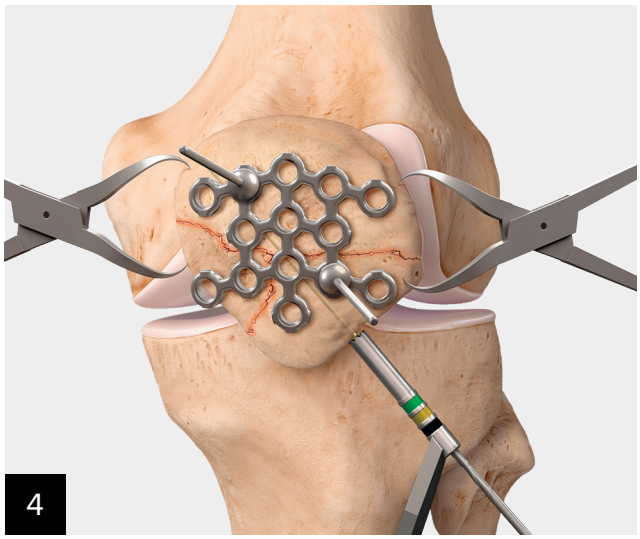
Reduce the bone fragments to the anatomic position using either small tenaculum or large Weber clamps.

After reducing the fracture, use the straight plate cutter to cut multiple rows to fit the anterior surface of the patella.

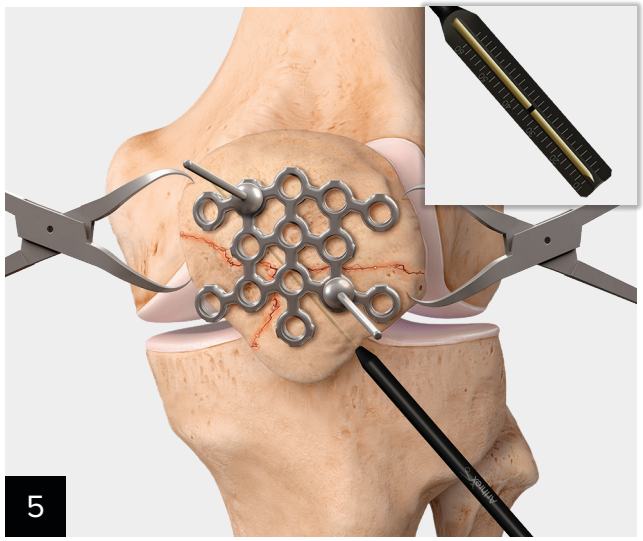
The curved plate cutter can be used for finer cuts around the screw holes. To help prevent sharp edges from causing soft-tissue irritation, place the plate into the jaws of the cutter as shown. Position the plate on the seating pin and cut as needed.



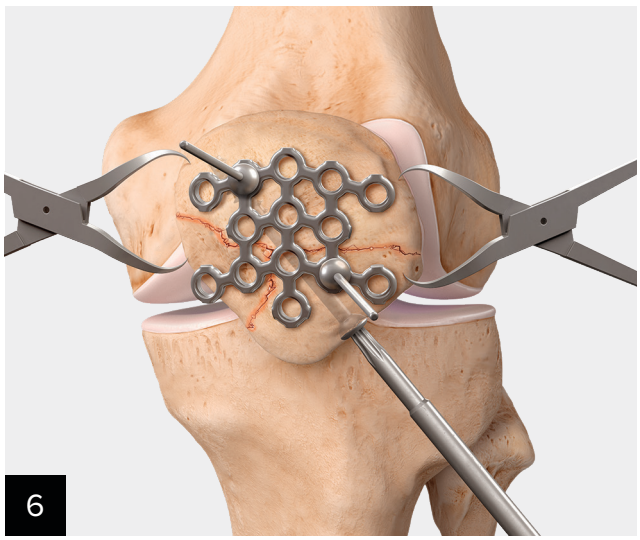
After the mesh plate is cut to the desired shape, the locking bending guide can be used to further shape the plate to match the patella surface. BB-Taks can be used to temporarily fix the plate to the bone.



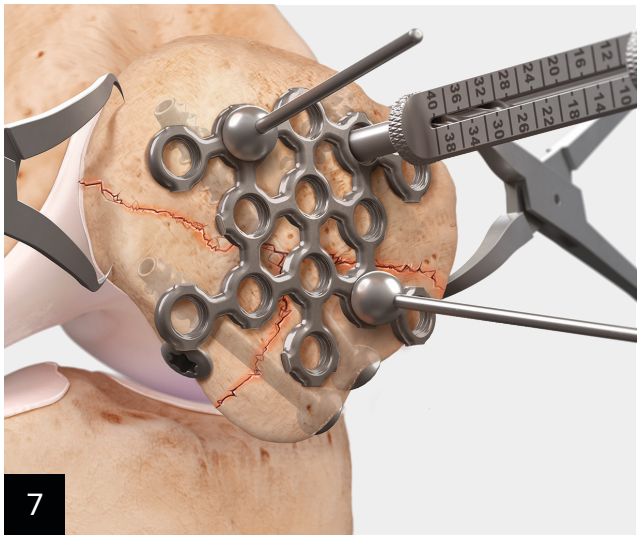
In addition to the plate, a 4.0 mm blunt-tip cannulated lag screw can be used to apply compression across fragments outside of the plate fixation. Use the 1.35 mm guidewire to check the screw trajectory and to measure the desired screw length prior to drilling with the 2.6 mm drill bit.



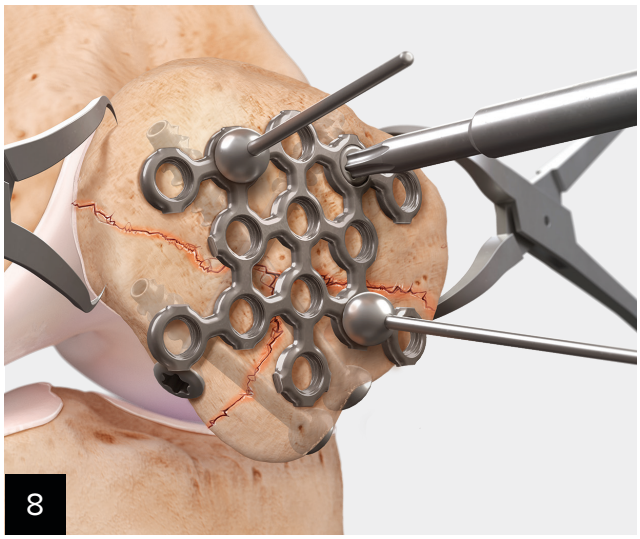
Determine the screw length by measuring the guidewire with the over-the-wire depth gauge and insert the correct cannulated 4.0 mm lag screw.



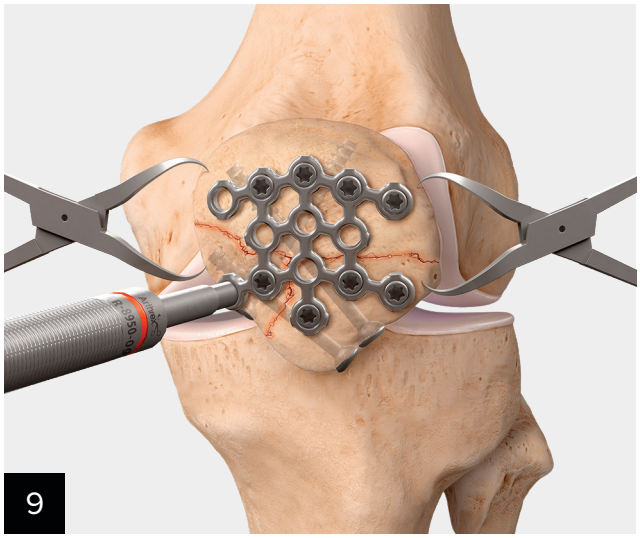
After confirming the screw length, over-drill the 1.35 mm guidewire with the 2.6 mm cannulated drill. Use the cannulated T15 driver to insert the 4.0 mm screw over the 1.35 mm guidewire.



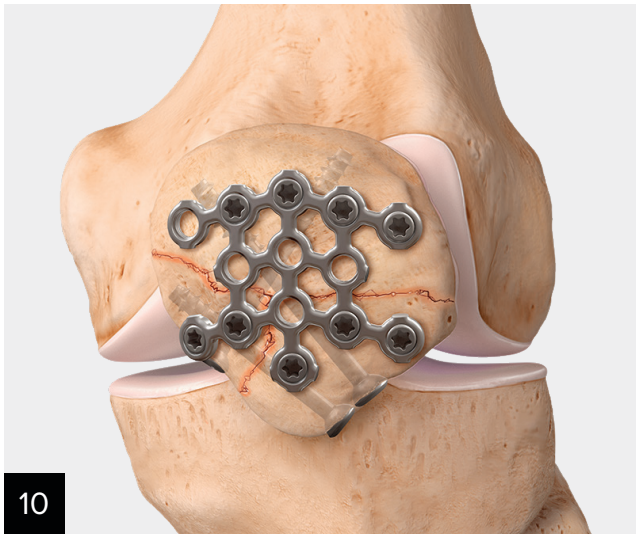
The locking drill guide is screwed into the locking holes before drilling. Ensure there are no guidewires or cannulated lag screws in the drill path. The screw length is determined by referencing the laser line on the 2.0 mm drill bit at the scale on the locking drill guide.



Leave the 2.7 mm low-profile screws fixed into the plate until the desired fixation is reached. Secure the locking screws with the T10 hexalobe driver.



Screws must not enter the articulating surface of the patella. If fragment size allows, three screws should be used for each fragment. The screw heads should sit flush with the plate.



Final fixation.

Contraindictions

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 conducted before implantation to rule out sensitivity.
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.

Warnings

1. An internal fixation device must never be reused.
2. All metallic implant devices used for this surgical procedure should have the same metallurgical composition.
3. Postoperatively and until healing is complete, fixation provided by this device should be considered as temporary and may not withstand weightbearing or other unsupported stress. The fixation provided by this device should be protected. The postoperative regimen prescribed by the physician should be strictly followed to avoid adverse stresses applied to the device.
4. Preoperative and operating procedures, including knowledge of surgical techniques and proper selection and placement of the device, are important considerations in the successful utilization of this device. The appropriate Arthrex delivery system is required for proper implantation of the device.
5. Any decision to remove the device should take into consideration the potential risk to the patient of a second surgical procedure. Device removal should be followed by adequate postoperative management.
6. Detailed instructions on the use and limitations of this device should be given to the patient.
7. This is a single-use device. Reuse of this device could result in failure of the device to perform as intended and could cause harm to the patient and/or user.
8. Removal of supplemental fixation after healing. If the supplemental fixation is not removed following the completion of its intended use, any of the following complications may occur: (1) corrosion, with localized tissue reaction or pain; (2) migration of implant position resulting in injury; (3) risk of additional injury from postoperative trauma; (4) bending, loosening, and/or breakage, which could make removal impractical or difficult; (5) pain, discomfort, or abnormal sensations due to the presence of the device; (6) possible increased risk of infection; and (7) bone loss due to stress shielding. The surgeon should carefully weigh the risks versus benefits when deciding whether to remove the implant. Implant removal should be followed by adequate postoperative management to avoid refracture.

Adverse Effects

1. Infections, both deep and superficial.
2. Foreign body reactions.
3. Mesh Plates for Patella Fracture only: Joint stiffness, malunion, non-union, device breakage, need for additional surgery, and screws entering the joint or damaging the articular surface.

Ordering Information

Mesh Plating System, Stainless Steel (AR-8957S)

Product Description	Item Number
Instruments	
TRIM-IT™ Depth Gauge, small	AR-**4166**
Bending Pliers, qty. 2	AR-**8941BP**
Screw Holding Forceps, self-retaining	AR-**8941F**
Bone Reduction Forceps, curved, pointed, qty. 2	AR-**8943-07**
Bending Iron Plate, qty. 2	AR-**8943-18**
Weber Clamp	AR-**8943-24**
Drill Guide, 2.0 mm/2.7 mm	AR-**8827D-02**
Driver, T10 hexalobe, qty. 2	AR-**8944DH**
Drill Guide, locking, threaded, 3 mm, qty. 2	AR-**8950-07**
Locking Bending Guide, 3 mm, qty. 2	AR-**8950-09**
Handle QC, ratcheting, cannulated	AR-**8950RH**
Plate Cutter, curved cut	AR-**8957-05**
Plate Cutter, straight cut	AR-**8957-06**
Instrument Case	AR-**8957C**
Plates (Order Separately)	
Mesh Plate, short, qty. 2 Mesh Plate, long, qty. 2	AR-**8957-04** AR-**8957-02**
Screws, Stainless Steel (Order Separately)	
Low Profile Screws, cortical, 2.7 mm × 10 mm-50 mm (2 mm increments)	AR-**8827-10 – 50**
Low Profile Locking Screws, 2.7 mm × 10 mm-50 mm (2 mm increments)	AR-**8827L-10 – 50**

Mesh Plating System, Titanium (AR-8957TS)

Product Description	Item Number
Instruments	
TRIM-IT Depth Gauge, small	AR-**4166**
Drill Guide, VAL, 3 mm	AR-**8933GV**
Drill Guide, VAL, 3 mm, qty. 4	AR-**8933GVN**
Bending Pliers, qty. 2	AR-**8941BP**
Screw Holding Forceps, self-retaining	AR-**8941F**
Bone Reduction Forceps, curved, pointed, qty. 2	AR-**8943-07**
Bending Iron Plate, qty. 2	AR-**8943-18**
Weber Clamp	AR-**8943-24**
Drill Guide, 2.0 mm/3.0 mm	AR-**8943-31**
Driver, T10 hexalobe, qty. 2	AR-**8944DH**
Drill Guide, locking, threaded, 3 mm, qty. 2	AR-**8950-07**
Locking Bending Guide, 3 mm, qty. 2	AR-**8950-09**
Handle QC, ratcheting, cannulated	AR-**8950RH**
Plate Cutter, curved cut	AR-**8957-05**
Plate Cutter, straight cut	AR-**8957-06**
Instrument Case	AR-**8957TC**
Plates (Order Separately)	
Mesh Plate, short, qty. 2 Mesh Plate, long, qty. 2	AR-**8957-03** AR-**8957-01**
Screws, Titanium (Order Separately)	
Low Profile Screws, cortex, Ti, 3.0 mm × 10 mm-50 mm (2 mm increments)	AR-**8933-10 – 50**
VAL Screw, Ti, 3 mm × 10 mm-40 mm, qty. 4	AR-**8933V-10 – 40**
Disposables	
BB-Tak, qty. 2	AR-**13226**
BB-Tak, threaded, qty. 2	AR-**13226T**
Guidewire, .045 in, qty. 3	AR-**8933K**
Guidewire w/ Double Trocar Tip, .045 in, qty. 3	AR-**8933KD**
Guidewire w/ Trocar Tip, threaded, .045 in, qty. 3	AR-**8933KT**
Guidewire w/ Trocar Tip, .062 in, qty. 3	AR-**8941K**
Guidewire w/ Trocar Tip, threaded, .062 in, qty. 3	AR-**8941KT**
Drill Bit, 2 mm, qty. 2	AR-**8944-22**
Drill Bit, 2.7 mm	AR-**8827D-01**
Drill Bit, 3.0 mm*	AR-**8950-05**

*Only included in AR-8957TS

Ordering Information

Patella Fracture Set (AR-5050S)

Product Description	Item Number
Instruments	
Over-the-Wire Depth Gauge	AR-**5050-02**
AO Pull Release Ratcheting Driver	AR-**5050-03**
Sternal Wire Driver, qty. 2	AR-**5050-04**
Small Weber Clamp, long throw, qty. 2	AR-**5050-05**
Patellar Measurement Device	AR-**5050-06**
Drill Guide, 2.0 mm/1.6 mm	AR-**5050-07**
Stout Wire Cutter, 9 in	AR-**5050-08**
Pliers, medium length	AR-**5050-09**
Passer, cerclage wire, bent	AR-**5050-10**
Parallel Drill Guide, patella fracture	AR-**5050-11**
Screw Holding Forceps, self-retaining	AR-**8941F**
Drill Bit, cannulated, 2.6 mm	AR-**8943-02**
Drill Guide, 2.6 mm/1.35 mm	AR-**8943-03**
Bone Tap, cannulated, 2.6 mm	AR-**8943-06**
Screwdriver, T15 hexalobe, cannulated	AR-**8943-09**
Holding Sleeve for 2.7 mm, 3.5 mm, and 4.0 mm screws	AR-**8943-11**
Driver, cannulated, QC, T15 hexalobe	AR-**8943-12**
Depth Device, 2.7 mm/3.5 mm/4.0 mm, low-profile	AR-**8943-15**
Freer Elevator	AR-**8943-19**
Sharp Hook	AR-**8943-21**
Weber Clamp	AR-**8943-24**
Patella Fracture Set Case	AR-**5050C**
Implants	
Low Profile Screws, cannulated, blunt tip, 4.0 mm × 24 mm-60 mm (2 mm increments)	AR-**5051-24 – 60**
Optional	
FiberTape Suture w/ Needle, 17 in	AR-**7237-17LN**

References

1. Müller EC, Frosch K-H. Functional outcomes of revision osteosynthesis after failure of surgical treatment of patellar fractures. *J Knee Surg.* 2019 Jul 9. https://doi.org/10.1055/s-0039-1692673
2. Pengas IP, Assiotis A, Khan W, Spalding T. Adult native knee extensor mechanism ruptures. *Injury.*2016;47(10):2065–2070.

Arthrex®