Acumed® Acutrak 2® Headless Compression Screw System—Foot and Ankle

Since its introduction in 1994, the Acutrak® Headless Compression Screw technology has revolutionized the way surgeons treat fractures, fusions, and osteotomies. The Acutrak 2 is the next generation in fully threaded headless fixation offering larger guide wires, larger hex drivers, and a tapered end reducing drill depth sensitivity. Long term surgeon feedback has helped develop this continuously variable fully threaded headless implant with instrumentation designed to simplify the surgical technique.

The Acutrak 2 family is composed of 67 screw size options to fit a wide variety of applications throughout the body, from 2.5 mm x 8 mm up to 7.5 mm x 120 mm.

<table>
<thead>
<tr>
<th>Definition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warning</td>
<td>Indicates critical information about a potential serious outcome to the patient or the user.</td>
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<tr>
<td>Caution</td>
<td>Indicates instructions that must be followed in order to ensure the proper use of the device.</td>
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<tr>
<td>Note</td>
<td>Indicates information requiring special attention.</td>
</tr>
</tbody>
</table>

This guide is intended for supplemental use only and is not intended to be used as a stand-alone surgical technique. Reference the Acumed Acutrak 2 Headless Compression Screw System Surgical Technique (SPF00-02) for more information.
# Table of Contents

Indications for Use ................................................................. 2
Quick Reference Chart .......................................................... 3
Surgical Techniques ............................................................... 4

- Distal Interphalangeal (DIP) Fusion Surgical Technique: Acutrak 2—Micro ......................................................... 4
- IP Fusion Surgical Technique: Acutrak 2—Standard and AcuTwist ................................................................. 6
- Hammertoe—PIP Fusion Surgical Technique: Acutrak 2—Micro ................................................................. 9
- Sesamoid Fracture Fixation Surgical Technique: Acutrak 2—Micro ......................................................... 11
- Chevron Bunionectomy Surgical Technique: Acutrak 2—Mini and Standard ..................................................... 14
- Scarf Bunionectomy Surgical Technique: Acutrak 2—Mini and Standard ..................................................... 16
- Proximal Fifth Metatarsal Fracture (Jones Fracture) Surgical Technique: Acutrak 2—4.7 and 5.5 .......................... 18
- TMT Fusion Surgical Technique: Acutrak 2—Standard ................................................................. 22
- Navicular Fracture Surgical Technique: Acutrak 2—Standard ................................................................. 24
- Standard Triple Arthrodesis Surgical Technique: Acutrak 2—4.7 and 7.5 ..................................................... 27
- Calcaneal Osteotomy Surgical Technique: Acutrak 2—7.5 ................................................................. 31
- Subtalar Fusion Surgical Technique: Acutrak 2—7.5 ................................................................. 35
- Talar Body Fracture Fixation Surgical Technique: Acutrak 2—4.7 ................................................................. 38
- Talar Dome Fracture Fixation Surgical Technique: Acutrak 2—Micro ..................................................... 42
- Ankle Fusion Surgical Technique: Acutrak 2—7.5 ................................................................. 45
- Fibula Fracture (Weber A and B Fractures) Surgical Technique: Acutrak 2—5.5 .................................................. 51
- Medial Malleolus Surgical Technique: Acutrak 2—4.7 ................................................................. 54

Ordering Information ............................................................... 56
Indications for Use

Foot and Ankle

AcuTwist® and Acutrak® 2 Micro, Mini, Standard, 4.7, and 5.5 are intended for use as fixation devices for small bones, bone fragments, and osteotomies. They are not intended for interference or soft tissue fixation.

Acutrak 2–7.5 may be used for fusions, fractures, or osteotomies of the clavicle, humerus, radius, ulna, ilium, femur, patella, fibula, tibia, talus, malleolus, and calcaneus.
# Acutrak 2® Quick Reference Chart

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Lengths</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micro</td>
<td></td>
<td>Where used to treat the indications described on page 2, it may be possible to use an Acutrak® screw of similar size instead of the Acutrak 2 screws listed here, or in place of a 2–2.4 mm headed screw</td>
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<tr>
<td></td>
<td></td>
<td>1.5 mm Hex Driver</td>
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<td>.035” (.88 mm) Guide Wire</td>
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<td></td>
<td>2 mm Hex Driver</td>
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<td>.045” (1.1 mm) Guide Wire</td>
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<td>Where used to treat the indications described on page 2, it may be possible to use an Acutrak screw of similar size instead of the Acutrak 2 screws listed here, or in place of a 4.5–6.5 mm headed screw</td>
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<td></td>
<td></td>
<td>3 mm Hex Driver</td>
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<td></td>
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<td>.062” (1.6 mm) Guide Wire</td>
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<tr>
<td></td>
<td></td>
<td>4 mm Hex Driver</td>
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<tr>
<td></td>
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<td>.094” (2.4 mm) Guide Wire</td>
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Distal Interphalangeal (DIP) Fusion
Surgical Technique: Acutrak 2®—Micro

1 Approach
The recommended procedure includes a longitudinal incision with resection of the distal end of the middle phalanx and removal of the distal phalanx cartilage with a curette. Care should be taken to avoid the nail matrix.

2 Advance Guide Wire
A double-ended guide wire is advanced from the DIP joint out the tip of the toe, just below the nail.

3 DIP Reduction
The joint is then reduced and the guide wire is driven proximally into the middle phalanx.
Distal Interphalangeal (DIP) Fusion
Surgical Technique: Acutrak 2®—Micro [continued]

4 Determine Screw Length
Make a short incision at the tip of the distal phalanx around the wire, down to bone. Measure the guide wire length either by using the percutaneous screw sizer or by placing a second wire at the entry point and subtracting the difference.

5 Drill
Select the cannulated drill and place over the wire. Drill using either a power drill or hand reamer across the joint into the middle phalanx to the desired depth.

Warning: The shoulder of the profile drill will bottom out on the near cortex.

6 Insert Screw
Insert the correct size screw with the appropriate hex driver. If resistance is met upon insertion or if distraction occurs: Stop, remove the screw, re-drill with the extended long drill and re-insert the screw. Confirm the placement and length of the screw under fluoroscopy, ensuring that both the leading and the trailing threads of the screw are within the bone. Lastly, remove the guide wire.
Interphalangeal (IP) Fusion
Surgical Technique: Acutrak 2®—Standard and AcuTwist®

1. **Approach**
   The recommended approach includes an incision transversely over the great toe interphalangeal (IP) joint. Transect the extensor tendon and tag with suture for retraction. The distal end of the proximal phalanx and the proximal end of the distal phalanx are resected. Care is taken to avoid the nail matrix.

2. **Advance Guide Wire**
   Make a small longitudinal incision over the wire at the toe tip. Then reduce the joint manually, and advance the guide wire retrograde to fixate the joint.

3. **Determine Screw Length**
   Measure the guide wire length either by using the percutaneous screw sizer or by placing a second wire at the entry point and subtracting the difference. Subtract 4 mm from the measured length to ensure that both ends of the screw are buried within the bone.
Interphalangeal (IP) Fusion
Surgical Technique: Acutrak 2®—Standard and AcuTwist® [continued]

4 **Drill**
Select the cannulated drill and place over the wire. Drill across the joint into the proximal phalanx to the desired depth. Typically the drill must only advance 4–5 mm past the fusion site to be effective.

5 **Drill the Near Cortex**
Open the near cortex with the appropriate profile drill.
6 Screw Insertion

Insert the correct size screw with the appropriate hex driver. If resistance is met upon insertion or if distraction occurs: Stop, remove the screw, re-drill with the long drill and re-insert the screw. Confirm the placement and length of the screw under fluoroscopy, ensuring that both the leading and the trailing threads of the screw are within the bone. Lastly, remove the guide wire.

7 Secondary Fixation

The second point of fixation is placed on the medial first phalange. The AcuTwist is advanced distally and laterally across the joint space taking care to avoid the first screw and measured with the screw sizer. The fixation is placed in both the medial cortex and lateral cortex on either side of the joint. Several threads should engage both cortices. Holding the smooth end of the screw, gently bend it back and forth until the screw fatigues at the break-off groove.

Note: If more than one AcuTwist Acutrak Compression Screw is to be utilized, it is advised to delay the break-off process until two or more of the screws have been inserted.
Hammertoe—Proximal Interphalangeal (PIP) Fusion

Surgical Technique: Acutrak 2®—Micro

1. **Approach and Needle Insertion**
   
   The recommended procedure includes a longitudinal incision with resection of the distal end of the proximal phalanx and removal of the middle phalanx cartilage with a curette. Care should be taken not to remove excessive bone from the middle phalanx, as this bone is typically very short and over-resection will compromise fixation.

2. **Advance Guide Wire**
   
   A double-ended guide wire is advanced into the distal phalanx through a transverse incision over the distal interphalangeal joint.

3. **Proximal Middle Phalanx Reduction**
   
   The joint is then reduced and the guide wire is driven proximally into the middle phalanx.
Hammertoe—Proximal Interphalangeal (PIP) Fusion
Surgical Technique: Acutrak 2®—Micro [continued]

4 Determine Screw Length
Make a short transverse (fish-mouth) incision in the tip of the distal phalanx and spread using a small (snap) clip. Measure the guide wire length either by using the percutaneous screw sizer or by placing a second wire at the entry point and subtracting the difference. If intending to drive the screw below the surface of the distal phalanx, this must be accounted for in sizing the screw.

5 Drill
Select the cannulated drill and place over the wire. Drill using either a power drill or hand reamer across the joint into the middle phalanx to the desired depth. If it is intended to drive the screw below the surface of the distal phalanx, this must be accounted for in the depth of the prepared hole.

*Warning:* The shoulder of the profile drill will bottom out on the near cortex.

6 Insert Screw
Insert the correct size screw with the appropriate hex driver. If resistance is met upon insertion or if distraction occurs: Stop, remove the screw, re-drill with the extended long drill and re-insert the screw. Confirm the placement and length of the screw under fluoroscopy, ensuring that both the leading and the trailing threads of the screw are within the bone. Lastly, remove the guide wire.
Sesamoid Fracture Fixation
Surgical Technique: Acutrak 2®—Micro

1 Approach
A stab incision close to the first flexion skin crease of the plantar aspect of the hallux is done distal to the weight-bearing area of the plantar skin. The soft tissues down to the sesamoid bone are bluntly divided with a clamp to avoid damage to the interdigital nerves. Under fluoroscopy, the fractured sesamoid is displayed.

2 Guide Wire Insertion
An appropriate size guide wire is introduced to the distal pole of the sesamoid with the hallux fixed in hyperextension. The course of the wire should be perpendicular to the fracture line and axial in the center of the bone. Pressure is applied to the proximal pole and the whole sesamoid bone against the first MTP joint as the guide wire advances. The position of the guide wire is confirmed in both lateral and AP X-ray views.
Sesamoid Fracture Fixation
Surgical Technique: Acutrak 2®—Micro [continued]

3 **Determine Drill Depth**

Measure the guide wire length either by using the percutaneous screw sizer or by placing a second wire at the entry point and subtracting the difference. The screw sizer cannot be used with the arthroscopic technique due to limited access. Subtract 4 mm from the measured length to ensure that both screw ends are buried within the bone.

4 **Advance Guide Wire**

Advance the guide wire through the far cortex with the long drill so that it lies in the subcutaneous tissues. This decreases the risk of accidental withdrawal of the guide wire while drilling and facilitates wire removal if it breaks.
Sesamoid Fracture Fixation
Surgical Technique: Acutrak 2®—Micro [continued]

5 Drill Far Fragment
Drill into the far fragment with the long drill. Typically the drill must advance only 4–5 mm past the fracture site to be effective.

Caution: The long drill is recommended to mitigate the effects of varying bone density and distraction upon screw insertion.

Note: Drilling by hand is recommended and should be performed while compressing the fragment into the body and preventing rotation.

6 Screw Insertion
Insert the correct size of screw with the appropriate hex driver. If resistance is met upon insertion or if distraction occurs: Stop, remove the screw, re-drill with the long drill, and re-insert the screw. Confirm the placement and length of the screw under fluoroscopy, ensuring that both the leading and the trailing threads of the screw are within the bone. Lastly, remove the guide wire.
Chevron Bunionectomy
Surgical Technique: Acutrak 2®—Mini and Standard

1. **Approach and Chevron Cut**
   Incision placement is made to surgeon preference, with typical dissection down to the subperiosteal level. Once any desired soft tissue work is completed, a classic chevron (Austin) cut is performed, with care taken to avoid damage to the sesamoid complex. In order to prevent elevation, the wedge is removed from the plantar surface.

2. **Guide Wire Placement**
   The guide wire is placed from the dorsal aspect of the metatarsal across the osteotomy into the capital fragment, with the aiming point toward the plantar first metatarsal head crista. The guide wire can be passed through the plantar cortex of the crista and then retracted to ensure the wire is in the subcortical bone of the first metatarsal head. Fluoroscopic imaging can also be used.

3. **Determine Screw Length**
   Measurements are taken once this wire is in place. Screw size is typically one size below the measured length to ensure proper placement of the screw and avoid protrusion of the screw into the joint space. Typically an Acutrak 2 Mini or Standard screw is used. Depending on patient anatomy, an AcuTwist® or Acutrak 2 Micro screw may be appropriate.
Chevron Bunionectomy
Surgical Technique: Acutrak 2®—Mini and Standard [continued]

4 Drill
Over drill the dorsal cortex prior to insertion of the screw. Only the dorsal cortex is commonly drilled, using the profile drill. The self-drilling design of the Acutrak 2 screw minimizes the need for full drilling. However, if desired, the long drill can be used to drill the entire length of the wire.

5 Insert Screw
Insert the correct size screw with the appropriate hex driver. This screw should be inserted from a proximal direction anchored bicortically. If resistance is met upon insertion or if distraction occurs: Stop, remove the screw, re-drill with the long drill and re-insert the screw. Confirm placement and length of the screw under fluoroscopy. Lastly, remove the guide wires.

6 Closure
Removal of redundant bone is performed and smoothed. Closure is in typical layered fashion.
Scarf Bunionectomy
Surgical Technique: Acutrak 2®—Mini and Standard

1 Approach and Scarf Cut
   Incision is made to surgeon preference, with typical dissection down to the subperiosteal level. Once any desired soft tissue work is completed a Scarf bone cut is performed. Displacement of the capital fragment is made according to preoperative planning. Temporary fixation using a wire or bone clamp is performed.

2 Guide Wire Placement
   The guide wire is placed from the dorsal aspect of the metatarsal across the osteotomy into the capital fragment. The point of aim is the plantar first metatarsal head crista. The guide wire can be passed through the plantar cortex of the crista and then retracted to ensure the wire is in the subcortical bone of the first metatarsal head. Fluoroscopic imaging can also be used.

3 Determine Screw Length
   Measurements are taken from this wire once in place. Screw size is typically one size below the measured length to ensure proper placement of the screw and avoid protrusion of the screw into the joint space. Typically an Acutrak 2 Mini or Standard screw is used. Depending on patient anatomy, an AcuTwist® or Acutrak 2 Micro screw may be appropriate.
Scarf Bunionectomy
Surgical Technique: Acutrak 2®—Mini and Standard [continued]

4 Drill
Over drill the dorsal cortex prior to insertion of the screw. Only the dorsal cortex is commonly drilled, using the profile drill. The self-drilling design of the Acutrak 2 screw minimizes the need for full drilling. However, if desired, the long drill can be used to drill the entire length of the wire.

5 Insert Screw
Insert the correct size screw with the appropriate hex driver. If resistance is met upon insertion or if distraction occurs: Stop, remove the screw, re-drill with the long drill and re-insert the screw. Confirm placement and length of the screw under fluoroscopy, ensuring that both leading and trailing threads of the screw are within the bone and do not violate the metatarsophalangeal (MTP) joint. Lastly, remove the guide wires.

6 Secondary Fixation
The second point of fixation is placed proximal to the first. The guide wire is advanced into the dense bone and measured with the screw sizer. The fixation is placed in both the dorsal cortex and plantar cortex of the first metatarsal. Several threads should engage both cortices.

7 Closure
Closure is in typical layered fashion.
Proximal Fifth Metatarsal (Jones Fracture)
Surgical Technique: Acutrak 2®—4.7 and 5.5

1 Patient Positioning
Position the patient in a semi-lateral position utilizing a bean bag body positioner. The patient should be moved to the distal end of the bed and the operative leg draped free as the side up. Exertion of the operative limb should be checked prior to prep and drape to confirm that the operative limb can be positioned on the mini C-arm during surgery.

2 Indication Area Outline
The base of the fifth metatarsal is outlined, including the insertions of the peroneus brevis and tertius tendons.
Proximal Fifth Metatarsal (Jones Fracture)
Surgical Technique: Acutrak 2®—4.7 and 5.5 [continued]

3 Approach and Exposure
The guide wire, .062”, for the Acutrak 2–4.7 Screw can be positioned at the base of the fifth metatarsal under fluoroscopic guidance. A small incision is made at the base of the fifth metatarsal at the intersection of the peroneus brevis and tertius tendons.

Caution: Care is made to identify and protect the sural nerve branches that run over the peroneal tendons.

If necessary, fibers of the lateral aponeurosis and peroneus brevis tendon are separated and retracted away from the styloid process of the base of the fifth metatarsal. A mini Hohmann retractor is placed on the plantar aspect of the base of the fifth metatarsal. The surgeon’s fingers can be used to reduce the fifth metatarsal fracture by placing them in between the fourth and fifth metatarsals. This closes down the fifth metatarsal fracture site during guide wire, drill and screw placement. A guide wire is drilled from the base of the fifth metatarsal into the central portion of the metatarsal shaft. It is maintained within the intramedullary canal in order to avoid distal penetration. Confirm placement with fluoroscopy.

4 Measure Depth
Depth is measured from the exposed portion of the guide wire with the cannulated depth gauge.

5 Advance Guide Wire
After selecting the appropriate size, advance the guide wire approximately 5 mm to maintain distal pin fixation before drilling.

Caution: Make sure not to compromise the distal joint surfaces when advancing the guide wire.
Proximal Fifth Metatarsal (Jones Fracture)
Surgical Technique: Acutrak 2®—4.7 and 5.5 [continued]

6 **Drill the Near Cortex**
Place the soft tissue guide (the guide should be used throughout) over the guide wire and open the near cortex using the appropriate cannulated profile drill.

7 **Drill**
Leaving the soft tissue guide in place, drill into the far fragment with the appropriate cannulated, long drill. Reference the markings on the drill to confirm desired depth.

**Caution:** The long drill is recommended to mitigate the effects of varying bone density and distraction upon screw insertion.
Proximal Fifth Metatarsal (Jones Fracture) 
Surgical Technique: Acutrak 2®—4.7 and 5.5 [continued]

8 Fracture Compression
In order to account for countersinking and fracture compression, a screw that measures 5 mm shorter than the measured total depth is inserted over the guide wire while protecting the soft tissues with a soft tissue guide.

9 Screw Insertion
The screw is placed while under fluoroscopic guidance in order to avoid cortical penetration.

Postoperative protocol: The patient is placed into a soft dressing, supported by a fiberglass splint.

It is advised that the patient not bear weight on the impacted foot for a period of 2–6 weeks postoperatively, depending upon the Torg type of fracture, bone quality, and underlying morbidities.
Tarsometatarsal (TMT) Fusion
Surgical Technique: Acutrak 2®—Standard

1 Approach
A dorsomedial incision is made centered over the tarsometatarsal (TMT) area between the extensor hallucis longus tendon and extensor hallucis brevis tendon. A second dorsolateral incision is made centered over the TMT area, roughly in line with the fourth metatarsal, lateral to the neurovascular bundle. Then reduce the TMT joint under direct visualization and image intensification. Fixate with a guide wire placed from the base of the metatarsal to the respective cuneiform.

2 Preparation
The joints are exposed and prepared by removing any dorsal spurs and resecting any remaining cartilage. The subchondral bone is removed down to cancellous bone on each side of the TMT joint.

3 Determine Screw Length
Measure the guide wire length either by using the percutaneous screw sizer or by placing a second wire at the entry point and subtracting the difference in length. Subtract 4 mm from the measured length to ensure that both ends of the screw are buried within the bone.
Tarsometatarsal (TMT) Fusion
Surgical Technique: Acutrak 2®—Standard [continued]

4 **Advance Guide Wire**

Advance the guide wire through the far cortex with the long drill, as this decreases the risk of accidental withdrawal of the guide wire while drilling and facilitates wire removal if it breaks.

5 **Drill Far Fragment**

Next, drill into the far fragment with the long drill. Typically the drill must only advance 4–5 mm past the fracture fusion site to be effective.

**Caution:** The long drill is recommended to mitigate the effects of varying bone density and distraction upon screw insertion.

6 **Drill the Near Cortex**

Open the near cortex with the appropriate profile drill. Countersink if it is felt to be necessary, as this will decrease the chances of the cortex cracking upon screw insertion.

7 **Screw Insertion**

Insert the correct size screw with the appropriate hex driver. If resistance is met upon insertion or if distraction occurs: Stop, remove the screw, re-drill with the long drill and re-insert the screw. Confirm the placement and length of the screw under fluoroscopy, ensuring that both the leading and the trailing threads of the screw are within the bone. Lastly, remove the guide wires.
Navicular Fracture
Surgical Technique: Acutrak 2®—Standard

1 **Compression**
   Make two small stab incisions dorsomedially and dorsolaterally. Insert the pointed reduction forceps through the incisions and place on the center of the fragments. Reduce carefully, ensuring that you do not overcompress.

2 **Preliminary Guide Wire**
   Preliminary fixation can be achieved using guide wires. Ensure the guide wire does not penetrate the joint.

3 **Check Reduction**
   Under direct vision, check for and ensure that the joint is anatomically reduced. If needed, palpitate the articular surface with an elevator screw under fluoroscopy, ensuring that both the leading and the trailing threads of the screw are within the bone. Lastly, remove the guide wire.
Navicular Fracture
Surgical Technique: Acutrak 2®—Standard [continued]

4 Fracture Stabilization
   If the fracture is unstable it may be helpful to place a second parallel guide wire using the parallel wire guides which are available for all three Acutrak 2 Screw families.

5 Determine Screw Length
   Measure the guide wire length either by using the percutaneous screw sizer or by placing a second wire at the entry point and subtracting the difference in length. The screw sizer cannot be used with the arthroscopic technique due to the limited access. Subtract 4 mm from the measured length to ensure that both ends of the screw are buried within the bone.

6 Advance Guide Wire
   Advance the guide wire through the far cortex with the long drill so that it lies in the subcutaneous tissues. This decreases the risk of accidental withdrawal of the guide wire while drilling and facilitates wire removal if it breaks.

7 Drill Far Fragment
   Next, drill into the far fragment with the long drill. Typically the drill must only advance 4–5 mm past the fracture site to be effective.

   Caution: The long drill is recommended to mitigate the effects of varying bone density and distraction upon screw insertion.
Navicular Fracture
Surgical Technique: Acutrak 2®—Standard [continued]

8 Drill the Near Cortex
Open the near cortex with the appropriate profile drill.

9 Screw Insertion
Insert the correct size screw with the appropriate hex driver. If resistance is met upon insertion or if distraction occurs: Stop, remove the screw, re-drill with the long drill, and re-insert the screw. Confirm the placement and length of the screw under fluoroscopy, ensuring that both the leading and the trailing threads of the screw are within the bone. Lastly, remove the guide wires.
Standard Triple Arthrodesis
Surgical Technique: Acutrak 2®—4.7 and 7.5

Three joints are fused in the triple arthrodesis, namely the subtalar (talocalcaneal/ST), talonavicular (TN), and calcaneocuboid (CC) joints. At times, a double arthrodesis is preferred, and fuses only two of the above-mentioned joints.

1 Incisions
Classically, the procedure is performed via one lateral and one medial incision. The lateral incision begins at the tip of the fibula and extends toward the cuboid-fourth metatarsal joint. The medial incision begins at the tip of the medial malleolus.

2 Lateral Exposure
Use a periosteal elevator to expose the surfaces of the calcaneus, cuboid, and talus. Prepare the calcaneocuboid and subtalar joints by removing any remaining cartilage and subchondral bone down to cancellous bone, leaving the overall contours of the bones intact. Once all cartilage is removed use a sharp osteotome to “fish-scale” the joints. Use a 2 mm drill bit to make multiple perforations in the subchondral bone to enhance fusion.

3 Subtalar Joint Reduction and Stabilization
Reduce the hindfoot deformity by rotating the calcaneus and the talus with a goal of 5 degrees of the valgus. The slight valgus can also be adjusted by removing extra bone from the medial or lateral side of the calcaneus when prepping the joint. Place 2 guide wires from the calcaneus into the talus, or vice-versa, or one in each direction. Avoid the weightbearing heel pad.
Standard Triple Arthrodesis
Surgical Technique: Acutrak 2®—4.7 and 7.5 [continued]

4 Fusion Reduction
If the fusion site is unstable it may be helpful to place a second parallel guide wire using the parallel wire guides which are available for all three Acutrak 2 screw families. The order of joint fusion is often surgeon dependent. Here, the order will be: 1) ST, 2) TN, and 3) CC joint. Bone graft is typically packed between the prepared spaces. Reduce the hindfoot by rotating the calcaneus and the talus with a goal of 5 degrees of valgus. Place 2 guide wires from the calcaneus into the talus, or vice-versa, or one in each direction. Avoid the weight-bearing heel pad.

5 Determine Screw Length
Measure the guide wire length either by using the percutaneous screw sizer or by placing a second wire at the entry point and subtracting the difference in length. Subtract 4 mm from the measured length to ensure that both ends of the screw are buried within the bone.

6 Advance Guide Wire
Advance the guide wire through the far cortex with the long drill, so that it lies in the subcutaneous tissues. This decreases the risk of accidental withdrawal of the guide wire while drilling and facilitates wire removal if it breaks.
7 **Drill Far Fragment**

Next, drill into the far fragment with the long drill. Typically the drill must only advance 4–5 mm past the fusion site to be effective.

**Caution:** The long drill is recommended to mitigate the effects of varying bone density and distraction upon screw insertion.

8 **Drill the Near Cortex**

Open the near cortex with the appropriate profile drill.

9 **Screw Insertion**

Insert the correct size screw with the appropriate hex driver. If resistance is met upon insertion or if distraction occurs: Stop, remove the screw, re-drill with the long drill, and re-insert the screw. Confirm the placement and length of the screw under fluoroscopy, ensuring that both the leading and the trailing threads of the screw are within the bone. Lastly, remove the guide wires.
Standard Triple Arthrodesis
Surgical Technique: Acutrak 2®—4.7 and 7.5 [continued]

10 Talonavicular Fusion
Reduce the talonavicular (TN) joint through pronation, adduction, and plantarflexion of the forefoot while pressure is applied from the plantar medial aspect of the talar neck to hold it in reduced position. Insert the guide wire to fixate and hold the TN joint approximately 5 degrees of valgus. Insert the screw in a manner similar to that described in steps 5–9.

11 Calcaneocuboid Fusion
Reduce the calcaneocuboid (CC) joint in a similar fashion to the TN joint reduction. Insert the guide wire to fixate and hold the CC joint approximately 5 degrees of valgus. Insert the screw in a manner similar to that described in steps 5–9.
Calcaneal Osteotomy
Surgical Technique: Acutrak 2®—7.5

Medial displacing calcaneal osteotomies are frequently performed to correct hindfoot valgus deformity. Lateral displacing calcaneal osteotomies are performed in patients with a cavus foot arising from the hindfoot. The plantar fascia must be released through a separate incision medially for a lateral displacing osteotomy, whereas the abductor hallucis muscle and medial neurovascular structures can be pushed away through the osteotomy bluntly prior to medial displacement of the osteotomized calcaneus.

1 Patient Positioning
Position the patient at the end of the bed, semi-lateral. Check that the leg can be placed easily onto the mini C-arm prior to preparation of the operative limb.

2 Approach and Exposure
An incision is made posterior to the peroneal tendons, perpendicular to the body of the calcaneus. Cephalad and caudal mini Hohmann retractors are placed to protect the neurovascular structures and plantar fascia. Care is made to preserve the peroneal tendons and the sural nerve.

Caution: Care is made to preserve the peroneal tendons and the sural nerve.
Calcaneal Osteotomy
Surgical Technique: Acutrak 2®—7.5 [continued]

3 Create Osteotomy
An oscillating saw is used to make the osteotomy cut perpendicular to the body of the calcaneus. The saw is not used to complete the cut through the medial cortex. This is completed with an osteotomy in order to avoid damaging medial neurovascular structures.

4 Guide Wire Placement
The body of the calcaneus is displaced medially or laterally and held in place with two guide pins.

The distal portion of the pins are placed at the volar aspect of the angle of Gissane in order to capture solid bone distally and assist with compression of the osteotomy by the screws. Confirm guide pin placement under fluoroscopy.

Note: The soft tissue protector and arthroscopic probe can be used to assist in guide wire placement.

5 Measure Depth
Depth is measured from the exposed portion of the guide wire with the cannulated depth gauge.
Calcaneal Osteotomy
Surgical Technique: Acutrak 2®—7.5 [continued]

6 Select Screw Size
Select a screw the same size as measured. However, to account for countersinking and compression it is common to select a screw one size shorter than the measured depth.

Advance the guide wire approximately 5 mm to maintain distal pin fixation before drilling.

Warning: Make sure not to compromise joint surfaces when advancing the guide wire.

7 Drill the Near Cortex
Place the soft tissue guide over the guide wire and open the near cortex using the appropriate cannulated profile drill.

Note: Drills 80-0945, 80-0946, and 80-0976 should be advanced slowly with continuous irrigation to decrease the potential of heat build-up. Clean the drill periodically during each procedure to optimize performance.

8 Drill
Leaving the soft tissue guide in place, drill into the far fragment with the appropriate cannulated, long profile drill. Reference the markings on the drill to confirm desired depth.

Caution: The long drill is recommended to mitigate the effects of varying bone density and distraction upon screw insertion.

Note: The Acutrak 2—7.5 Long Drill does not show depth markings relative to the bone surface.
Calcaneal Osteotomy
Surgical Technique: Acutrak 2®—7.5 [continued]

9 Screw Insertion
Cannulated Acutrak 2 screws are appropriately placed. Placement is confirmed by lateral and axial fluoroscopy views in the operating room.

Caution: The marking on the driver shows when the screw is approximately flush with the end of the soft tissue protector; ensure that the soft tissue protector is touching bone to accurately determine screw depth. Verify final screw position with fluoroscopy.

10 Additional Screw Placement
Repeat steps 5–9 for each additional screw placement.

Note: Bone density has a great effect on the performance of drills. Peck drilling with long drills is advised.

Drills 80-0945, 80-0946, and 80-0976 should be advanced slowly with continuous irrigation to decrease the potential of heat build-up. Clean drill periodically during each procedure to optimize performance.

11 Postoperative Protocol
The following protocol may be replaced with an alternative protocol at the performing surgeon’s discretion.

The operative limb is placed into a bulky compression dressing. A splint is also placed. It is advised that the patient not bear weight on the affected foot by being placed in a cast, boot, or splint for 6 weeks after surgery.
Subtalar Fusion
Surgical Technique: Acutrak 2®—7.5

1 Approach
The procedure is performed via a lateral incision beginning at the tip of the fibula and extending toward the articulation of the cuboid and fourth metatarsal joint. The extensor digitorum brevis can be split or elevated in a distal direction. Ensure that the crossing branch of the sural nerve to the dorsal intermediate branch of the superficial peroneal nerve and peroneal tendons are protected during exposure.

2 Joint Preparation
Prepare the joint by completely removing cartilage from the posterior and middle facets using a sharp osteotome, a curette, and a rongeur, leaving the overall contours of the bones intact.

Once all cartilage is removed, use a sharp osteotome to “fish-scale” the posterior and middle facets. Using a 2 mm drill bit, make multiple perforations in the subchondral bone to enhance fusion.

3 Reduction and Fusion Stabilization
Reduce the hindfoot deformity by rotating the calcaneus and the talus with a goal of 5 degrees of the valgus. The slight valgus can also be adjusted by removing extra bone from the medial or lateral side of the calcaneus when prepping the joint. Place 2 guide wires from the calcaneus into the talus, or vice-versa, or one in each direction. Avoid the weight-bearing heel pad.
Subtalar Fusion
Surgical Technique: Acutrak 2®—7.5 [continued]

4 Determine Screw Length
Measure the guide wire length either by using the percutaneous screw sizer or by placing a second wire at the entry point and subtracting the difference in length. Subtract 4 mm from the measured length to ensure that both ends of the screw are buried within the bone.

5 Advance Guide Wire
Advance the guide wire through the far cortex with the long drill, so that it lies in the subcutaneous tissues. This decreases the risk of accidental withdrawal of the guide wire while drilling and facilitates wire removal if it should break.

6 Drill Far Fragment
Next, drill into the far fragment with the long drill. Typically the drill must only advance 4–5 mm past the fracture fusion site to be effective.

Caution: The long drill is recommended to mitigate the effects of varying bone density and distraction upon screw insertion.
Subtalar Fusion
Surgical Technique: Acutrak 2®—7.5 [continued]

7 Drill the Near Cortex
Open the near cortex with the appropriate profile drill.

8 Screw Insertion
Insert the correct size screw with the appropriate hex driver. If resistance is met upon insertion or if distraction occurs: Stop, remove the screw, re-drill with the long drill, and re-insert the screw. Confirm the placement and length of the screw under fluoroscopy, ensuring that both the leading and the trailing threads of the screw are within the bone. Lastly, remove the guide wires.
Talar Body Fracture Fixation
Surgical Technique: Acutrak 2®—4.7

Talar body fracture fixation transmalleolar medial approach.

1 **Approach**

A medial malleolus osteotomy is performed, exposing the talus. Subtalar comminution is removed if present.

2 **Reduction**

The fracture is reduced either manually or with clamps.
Talar Body Fracture Fixation
Surgical Technique: Acutrak 2®—4.7 [continued]

3 Approach
The first guide is inserted posterior medial to anterior lateral while remaining inferior to allow for placement of a second wire. A second wire is introduced medially and dorsally into the talar neck.

4 Determine Drill Depth
Measure the guide wire length either by using the percutaneous screw sizer or by placing a second wire at the entry point and subtracting the difference in length. The screw sizer cannot be used with the arthroscopic technique due to the limited access. Subtract 4 mm from the measured length to ensure that both screw ends are buried within the bone.
Talar Body Fracture Fixation
Surgical Technique: Acutrak 2®—4.7 [continued]

5 Advance Guide Wire
Advance the guide wire through the far cortex with the long drill so that it lies in the subcutaneous tissues. This decreases the risk of accidental withdrawal of the guide wire while drilling and facilitates wire removal if it breaks.

6 Drill Far Fragment
Drill into the far fragment with the long drill. Typically the drill must only advance 4–5 mm past the fracture site to be effective.

Caution: The long drill is recommended to mitigate the effects of varying bone density and distraction upon screw insertion.
Talar Body Fracture Fixation
Surgical Technique: Acutrak 2®—4.7 [continued]

7 Drill the Near Cortex
Open the near cortex with the appropriate profile drill.

8 Insert Screw
Insert the correct size screw with the appropriate hex driver. If resistance is met upon insertion or if distraction occurs: Stop, remove the screw, re-drill with the long drill, and re-insert the screw. Confirm the placement and length of the screw under fluoroscopy, ensuring that both the leading and the trailing threads of the screw are within the bone. Lastly, remove the guide wires.
Talar Dome Fracture Fixation
Surgical Technique: Acutrak 2®—Micro

Talar dome fracture fixation or fixing of large osteochondral lesion with intact subchondral (medial) bone.

1 **Approach**

A medial malleolus osteotomy is performed, exposing the talus. Subtalar comminution is removed if present. Remove the fragment and curette. Perforate the base of the cavity with the drill.

2 **Insert Guide Wire**

Gently scrape only through the center of the bone. Pass the guide wire from the underside of the fragment. Make sure the guide wire is exactly perpendicular to the surface of the subchondral bone. Use the double-ended guidewire if possible. Place the OC fragment into the cavity and check the orientation. Pass the guide wire into the talar body.

**Note:** Often the bone will be smaller than the cartilage cap.
Talar Dome Fracture Fixation
Surgical Technique: Acutrak 2®—Micro [continued]

3 **Determine Drill Depth**
Measure the guide wire length either by using the percutaneous screw sizer or by placing a second wire at the entry point and subtracting the difference in length. Subtract 4 mm from the measured length to ensure that both ends of the screw are buried within the bone.

**Caution:** The screw sizer cannot be used with the arthroscopic technique due to limited access.

4 **Advance Guide Wire**
Advance the guide wire through the far cortex with the long drill until it lies in the subcutaneous tissues. This decreases the risk of accidental withdrawal of the guide wire while drilling and facilitates wire removal if it breaks.

5 **Drill Far Fragment**
Drill into the far fragment with the long drill. Typically the drill only must only advance 4–5 mm past the fracture site to be effective.

**Caution:** The long drill is recommended to mitigate the effects of varying bone density and distraction upon screw insertion.

**Note:** Drilling by hand is recommended, while compressing the fragment into the body and preventing rotation.
Talar Dome Fracture Fixation
Surgical Technique: Acutrak 2®—Micro [continued]

6 Drill the Near Cortex
Open the near cortex with the appropriate profile drill.

7 Insert Screw and Confirm Placement
Insert the correct size of screw with the appropriate hex driver. Check the X-ray frequently when the screw is below the cartilage cap. If resistance is met upon insertion or if distraction occurs: Stop, remove the screw, re-drill with the long drill, and re-insert the screw. Confirm placement and length of the screw under fluoroscopy, ensuring that both the leading and the trailing screw threads are within the bone. The screw base must be exactly at the level of the subchondral bone in two planes. Make sure the base of the screw is flush with the surface of the subchondral bone. Remove the guide wires.

Based on variation in osteochondral lesion size, an Acutrak 2 Mini or Standard may be appropriate.
Ankle Fusion

Surgical Technique: Acutrak 2®—7.5

Lateral Approach

There are two main approaches for fusing an ankle, namely the lateral approach and the anterior approach. Both are described below. The lateral approach usually incorporates excision of the distal fibula as direct access to the ankle. The anterior approach spares the fibula, allowing direct access to the anterior ankle, and theoretically preserving the fibula for a possible total ankle replacement in the future. Thus, the anterior approach is typically used in younger individuals.1


Approach

A hockey stick incision is made over the fibula laterally with an anterior direction just distal to the tip of the fibula. Subperiosteal dissection is carried around the distal 3 cm of the fibula, and a microsagittal saw is used to perform a distal fibulectomy, beginning proximal lateral and ending distal medial. The ankle capsule is released anteriorly and posteriorly, allowing for access to the lateral tibiotalar joint.

Preparation and Guide Wire Insertion

The distal tibia and dorsal talus are decorticated down to cancellous bone, leaving the convexity of the talus and concavity of the distal tibia intact. A guide wire is used to make vascular ingrowth channels in the distal tibia and dorsal talus. Any angular deformities present are corrected via bone removal. Cancellous bone is harvested from the excised distal fibula and packed into the tibiotalar joint. Guide wires from the large Acutrak 2 Screw System are placed across the tibiotalar joint. Either two or three wires are used, one from the anterolateral tibia to the posterior medial talus, one from the lateral process of the talus into the medial aspect of the distal tibia, and one from the anterolateral talar neck into the distal medial tibia. On an anterior-posterior (AP) view the guide wires form an X, and on the lateral view they are parallel to one another.
Ankle Fusion
Surgical Technique: Acutrak 2®—7.5 [continued]

Lateral Approach

3 Determine Screw Length
Measure the guide wire length either by using the percutaneous screw sizer or by placing a second wire at the entry point and subtracting the difference in length. The screw sizer cannot be used with the arthroscopic technique due to the limited access. Subtract 4 mm from the measured length to ensure that both ends of the screw are buried within the bone.

4 Advance Guide Wire
Advance the guide wire through the far cortex so that it lies in the subcutaneous tissues. This decreases the risk of accidental withdrawal of the guide wire while drilling and facilitates wire removal if it breaks.

5 Drill Far Fragment
Next, drill into the far fragment with the long drill. Typically the drill must only advance 4–5 mm past the fusion site to be effective.

Warning: Make sure not to violate the subtalar joint.

Caution: The long drill is recommended to mitigate the effects of varying bone density and distraction upon screw insertion.
Ankle Fusion
Surgical Technique: Acutrak 2®—7.5 [continued]

Lateral Approach

6 Drill the Near Cortex
Open the near cortex with the appropriate profile drill.

7 Screw Insertion
Insert the correct size large Acutrak 2 7.5 screw with the appropriate hex driver. If resistance is met upon insertion or if distraction occurs: Stop, remove the screw, re-drill with the long drill, and re-insert the screw. Confirm the placement and length of the screw under fluoroscopy, ensuring that both the leading and the trailing threads of the screw are within the bone. Lastly, remove the guide wires.
Ankle Fusion
Surgical Technique: Acutrak 2®—7.5 [continued]

Anterior Approach

1. Approach

An incision is made on the anterior aspect of the ankle, just lateral to the tibialis anterior tendon, and medial to the extensor hallucis tendon and neurovascular bundle. The posterior sheath of the extensor hallucis longus (EHL) is incised, along with the anterior ankle capsule. Subperiosteal dissection is carried out medially and laterally.

2. Preparation and Guide Wire Insertion

The distal tibia and dorsal talus are decorticated down to cancellous bone, leaving the convexity of the talus and concavity of the distal tibia intact. A guide wire is used to make vascular ingrowth channels in the distal tibia and dorsal talus. Any angular deformities present are corrected via bone removal. Cancellous bone, either autograft or allograft, is packed into the tibiotalar joint. Guide wires from the large Acutrak 2 Screw System are placed across the tibiotalar joint. Either 2 or 3 wires are used, one from anterolateral tibia to posterior medial talus, one from the posterior medial tibia to the anterolateral talus, and a homerun screw from the posterior tibia down the talar neck.
Ankle Fusion
Surgical Technique: Acutrak 2®—7.5 [continued]

Anterior Approach

3 Determine Screw Length
Measure the guide wire length either by using the percutaneous screw sizer or by placing a second wire at the entry point and subtracting the difference in length. The screw sizer cannot be used with the arthroscopic technique due to the limited access. Subtract 4 mm from the measured length to ensure that both ends of the screw are buried within the bone.

4 Advance Guide Wire
Advance the guide wire through the far cortex with the long drill, so that it lies in the subcutaneous tissues. This decreases the risk of accidental withdrawal of the guide wire while drilling and facilitates wire removal if it breaks.

5 Drill Far Fragment
Next, drill into the far fragment with the long drill. Typically the drill must only advance 4–5 mm past the fracture site to be effective.

Warning: Make sure not to violate the subtalar joint.

Caution: The long drill is recommended to mitigate the effects of varying bone density and distraction upon screw insertion.
Ankle Fusion
Surgical Technique: Acutrak 2®—7.5 [continued]

Anterior Approach

6 Drill the Near Cortex
Open the near cortex with the appropriate profile drill.

7 Screw Insertion
Insert the correct size screw with the appropriate hex driver. If resistance is met upon insertion or if distraction occurs: Stop, remove the screw, re-drill with the long drill, and re-insert the screw. Confirm the placement and length of the screw under fluoroscopy, ensuring that both the leading and the trailing threads of the screw are within the bone. Lastly, remove the guide wires.
Fibula Fracture (Weber A and B Fractures)
Surgical Technique: Acutrak 2®—5.5

1 Site Preparation
Prepare the fracture, fusion, or osteotomy site using the surgeon’s preferred technique. Remove any fibrous or interposed tissue, and bone graft as needed. For an open approach, use either a straight longitudinal or J-shaped incision. For a percutaneous approach, make a stab incision at the screw entry site. Bluntly dissect down to the tip of the fibula.

2 Guide Wire Insertion
Insert a .062" guide wire to the appropriate depth. The recommended entry point is 2 mm medial to the fibular tip. Direct the guide wire parallel to the medullary canal. Check placement of the wire under fluoroscopy. To prevent rotation of the fragment, use the same procedure to insert a second guide wire parallel to the first wire. Take care to avoid the posterior tibial tendon just posterior to the malleolus.
Determine Screw Length

Measure the guide wire with a Large Acutrak 2® Screw Sizer. This ensures contact with cortical bone. Or, place a second wire at the entry point and subtract the difference. This measurement indicates the appropriate screw length that will place the screw at the tip of the guide wire. Subtract appropriately for any anticipated fragment reduction resulting from screw insertion.

Drill Far Fragment

Drill into the far fragment with the long drill for each implant. Typically, the drill must only advance 4–5 mm past the fracture site to be effective.

Caution: The long drill is recommended to mitigate the effects of varying bone density and distraction upon screw insertion.
Fibula Fracture (Weber A and B Fractures)
Surgical Technique: Acutrak 2®—5.5 [continued]

5 Drill the Near Cortex
The near cortex is opened using the appropriate size of profile drill to accommodate each implant.

6 Screw Insertion
Insert the correct size of screw with the appropriate hex driver. If resistance is met upon insertion or if distraction occurs: Stop, remove the screw, re-drill with the long drill, and re-insert the screw. Confirm the placement and length of the screw under fluoroscopy, ensuring that both the leading and the trailing threads of the screw are within the bone. Lastly, remove the guide wires.
1 Site Preparation

For an open approach, use either a straight longitudinal or J-shaped incision. Prepare the fracture, fusion, or osteotomy site using the surgeon’s preferred technique. Remove any fibrous or interposed tissue, and bone graft as needed.

For a percutaneous approach, make a stab incision at the screw entry site then bluntly dissect down to the tip of the malleolus.

2 Guide Wire Insertion

Insert the .062” guide wire to the appropriate depth. Check placement of the wire under fluoroscopy. To prevent rotation of the fragment, insert a second guide wire parallel to the first wire, following the same procedure. Take care to avoid the posterior tibial tendon just posterior to the malleolus.

3 Determine Screw Length

Each guide wire is measured using the Large Acutrak 2 Screw Sizer, ensuring contact with cortical bone, or by placing a second wire at the entry point and subtracting the difference. This measurement indicates the appropriate screw length to place the screw at the tip of the guide wire. Subtract appropriately for any anticipated fragment reduction resulting from screw insertion.
Medial Malleolus
Surgical Technique: Acutrak 2®—4.7 [continued]

4 Drill Far Fragment
   Next, drill into the far fragment with the long drill for each implant. Typically the drill must only advance 4–5 mm past the fracture site to be effective.
   **Caution:** The long drill is recommended to mitigate the effects of varying bone density and distraction upon screw insertion.

5 Drill the Near Cortex
   The near cortex is opened using the appropriate size profile drill to accommodate each implant.

6 Screw Insertion
   Insert the correct size screw with the appropriate hex driver. If resistance is met upon insertion or if distraction occurs: Stop, remove the screw, re-drill with the long drill, and re-insert the screw. Confirm placement and length of the screw under fluoroscopy, ensuring that both the leading and the trailing edges of the screw are beneath the articular surfaces. Repeat steps for the additional screw. Lastly, remove the guide wires.
## Ordering Information

### Acutrak 2® Micro Implants

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<td>45 mm Acutrak 2—4.7 Screw</td>
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<td>50 mm Acutrak 2—4.7 Screw</td>
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#### Acutrak 2°—5.5

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<td>20 mm Acutrak 2—5.5 Screw</td>
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<td>22 mm Acutrak 2—5.5 Screw</td>
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<td>30 mm Acutrak 2—5.5 Screw</td>
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<td>55 mm Acutrak 2—5.5 Screw</td>
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<td>60 mm Acutrak 2—5.5 Screw</td>
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<td>Acutrak 2—5.5 Profile Drill</td>
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<td>Acutrak 2—5.5 Long Drill</td>
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#### Additional Instrumentation

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<tr>
<th>4.7 and 5.5 Instrumentation</th>
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<tr>
<td>1.6 mm Guide Wire Probe</td>
<td>80-0992</td>
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<tr>
<td>1.6 mm (.062&quot;) x 9.25&quot; Guide Wire</td>
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<tr>
<td>3.0 mm Cannulated QR Hex Driver Tip AT2</td>
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<tr>
<td>3.0 mm Solid QR Hex Driver Tip AT2</td>
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### Ordering Information [continued]

#### Acutrak 2°—7.5

**Implants**

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**Instrumentation**

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<tr>
<td>2.4 mm Guide Wire Probe</td>
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<td>2.4 mm (.094&quot;) x 9.25&quot; Guide Wire</td>
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<tr>
<td>2.4 mm (.094&quot;) x 9.25&quot; Guide Wire, Threaded</td>
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<tr>
<td>Acutrak 2—7.5 Profile Drill</td>
<td>80-0975</td>
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<tr>
<td>4.0 mm Cannulated QR Hex Driver Tip AT2</td>
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<tr>
<td>4.0 mm Solid QR Hex Driver Tip AT2</td>
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**Additional Instrumentation**

#### 4.7, 5.5 and 7.5 Instrumentation

<table>
<thead>
<tr>
<th>Item Description</th>
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<tbody>
<tr>
<td>Large Acutrak 2 Drills and Driver Platter</td>
<td>80-0870</td>
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<tr>
<td>Large Acutrak 2 Common Instrument Platter</td>
<td>80-0871</td>
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<tr>
<td>Small Ratchet Handle with QR Connection</td>
<td>80-0398</td>
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<td>Forceps</td>
<td>AT-7005</td>
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<tr>
<td>Ratchet T-Handle with A/O Connection</td>
<td>80-0999</td>
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<tr>
<td>Sharp Hook</td>
<td>PL-CL06</td>
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<tr>
<td>3.0 mm Easyout, Quick Release</td>
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**Additional Sterile Instrumentation**

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<tr>
<td>Large Acutrak 2 Screw System Lid</td>
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#### Note:

All screws are also available sterile-packed. Add an -S to end of product number for sterile product.

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