SALVATION™ 2
Midfoot Nail

SURGICAL TECHNIQUE

WRIGHT™
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SALVATION™ 2

Midfoot Nail

SURGICAL TECHNIQUE

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Wright recognizes that proper surgical procedures and techniques are the responsibility of the medical professional. The following guidelines are furnished for information purposes only. Each surgeon must evaluate the appropriateness of the procedures based on his or her personal medical training, experience, and patient condition. Prior to use of the system, the surgeon should refer to the product Instructions For Use package insert for additional warnings, precautions, indications, contraindications and adverse effects. Instructions For Use package inserts are also available by contacting the manufacturer. Contact information can be found on the back of this surgical technique and the Instructions For Use package inserts are available on wright.com under the link for Prescribing Information.

Please contact your local Wright representative for product availability.

Product Introduction

chapter 1

Device Description

The SALVATION™ 2 Midfoot Nailing System is designed to address the unique demands of advanced midfoot reconstruction. This system focuses on treating cases such as neuropathic deformity requiring arthrodesis of the medial and lateral columns, with or without corrective osteotomies. Patients with poor quality, soft bone (e.g. Charcot), require implants specifically designed to deliver strength and maintain purchase in these difficult cases. The SALVATION™ 2 Midfoot Nailing System is designed to specifically address these patients, while providing easy to use instrumentation that assists in attaining reproducible results.

The SALVATION™ 2 Midfoot Nailing System can be used in conjunction with external fixation, additional nails, beams, plates, or contact casting until bony fusion has occurred.

Intended Use

chapter 2

Intended Use

The SALVATION™ 2 Midfoot Nailing System is indicated for fixation of fractures, osteotomies, reconstruction procedures, non-unions, and fusions of bones in the foot and ankle including the Metatarsals, Cuneiforms, Cuboid, Navicular, Calcaneus and Talus. Specific examples include: Intramedullary Medial Column Fusion, Lateral Column Fusion and Subtalar Fusions resulting from neuropathic osteoarthropathy (Charcot).

General Surgical Contraindications

- Infection
- Physiologically or psychologically inadequate patient
- Inadequate skin, bone, or neurovascular status
- Irreparable tendon system
- Possibility for conservative treatment
- Growing patients with open epiphyses
- Patients with high levels of activity

There are no contraindications specific to the products.

Prior to use of the system, the surgeon should refer to the product package insert for complete warnings, precautions, indications, contraindications and adverse effects. Package inserts are also available by contacting the manufacturer. Contact information can be found on the back of this surgical technique and the package insert is available on the website listed.

Device Description

chapter 3

SALVATION™ 2 Midfoot Nailing System

8.0mm Nails

- Lengths: 60mm to 160mm by 5mm increments
- Thread Length: 25mm
- Slot Length: 8.0mm (max screw travel)

3.5mm Non-Locking Screw

- Lengths: 14mm to 40mm by 2mm increments

Preoperative Planning

chapter 4

Preoperative planning is left to the discretion of the surgeon.

Surgical Procedure

chapter 5

A gastrocnemius slide or percutaneous tendo–Achilles lengthening should be considered in midfoot reconstruction to minimize stress across the midfoot.

Perform osteotomies as needed to correct deformity and properly align the foot. Utilize 2.4mm K-wires to provisionally hold the foot in the proper neutral plantigrade position during the procedure, if needed. Keep in mind the intended placement of permanent fixation when placing these temporary wires.

Midfoot Nail

Make a medial utility incision along the axis of the medial column to allow access and exposure of the medial column joints. In some cases, a bi-planar wedge resection may be needed to correct deformity. This is left to the discretion of the surgeon and individual case needs.

It is recommended when intending to fuse a joint, that the joint be resected and prepared. Debride the tarsometatarsal (TMT), naviculocuneiform (NC) and talonavicular (TN) joints down to bleeding subchondral bone. Identify and avoid the tibialis anterior tendon, during the procedure. In some cases, the anterior tendon will need to be transected and advanced once deformity correction is complete. Expose the first metatarsal phalangeal joint by making a dorsal incision.

Plantarflex the first MTP and insert the 2.4mm K-wire (SMN10017) through the articular surface of the first metatarsal into the medial column. Advance the wire into the first metatarsal intramedullary canal and follow the canal trajectory through the cuneiform, navicular, and into the talus. Keep in mind that minor changes in angulation of the wire can substantially affect the distal position of this wire due to the length of the throw. Utilizing fluoroscopy, advance the wire until the tip of the wire is in the desired implant position in the talus. **FIGURE 1**

FIGURE 1

NOTE: Evaluate wire placement in all planes using fluoroscopy and ensure the guide wire is centered in the talar neck and body.

It is not recommended that the wire penetrate the posterior cortex of the talus.

Place the Depth Gauge (SMN10016) over the 2.4mm K-wire and slide the tip down to the articular surface of the metatarsal to determine the appropriate length of the implant. Read the appropriate length from the graduations on the Depth Gauge. Subtract the countersink length and the estimated 8mm compression from the reading on the Depth Gauge. **FIGURE 2**

FIGURE 2

Remove the Depth Gauge and pre-drill over the K-wire with the 5.0mm (SB080050) Drill. Assess the anatomy to ensure there is adequate room for an 8mm diameter implant. Then, using the 8.0mm Step Drill (SMN10018), drill over the K-wire to prepare for insertion of the implant. Utilize fluoroscopy to ensure that the drill is not advanced further than the K-wire. **FIGURE 3**

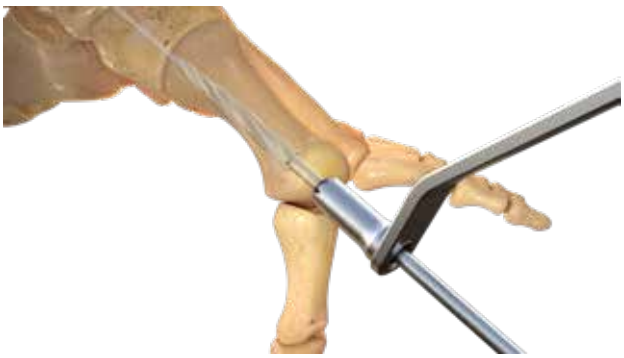

FIGURE 3

Ensure that the compressing screw is properly positioned in such a manner that it does not occlude the compression slot. It should be just past the compression slot on the driving end of the nail. **FIGURE 4**

FIGURE 4

NOTE: Proper starting position for compressing screw.

The desired nail implant is assembled to the Implant Holder (SMN10008) and tightened down using the Star 30 Driver (MT5670AC) and the Ratcheting T-Handle (SB90009). **FIGURE 5**

FIGURE 5

The implant is placed over the K-wire and advanced using the Quick Connect Inserter (SMN10009). **FIGURE 6**

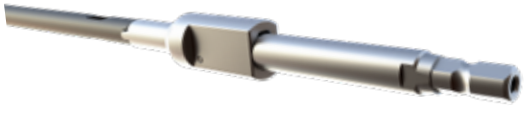

FIGURE 6

The implant is inserted until the distal end of the implant is approximately 10mm from the end of the metatarsal head. The 5mm Compression Spacer (SMN10001) is then attached to the Implant Holder (if needed) and the implant is advanced by hand using the Ratcheting T-Handle. The nail should be positioned with all threads in the Talus, and the driving end of the nail should be inserted at least 5mm beyond the surface of the metatarsal head. Confirm implant position in the talus using fluoroscopy. It is critically important to attain good purchase in talar bone. Care should be taken to ensure that the driving end of the nail remains below the surface of the metatarsal head surface once all compression is completed. Remove the K-wire once the nail is in position. **FIGURE 7**

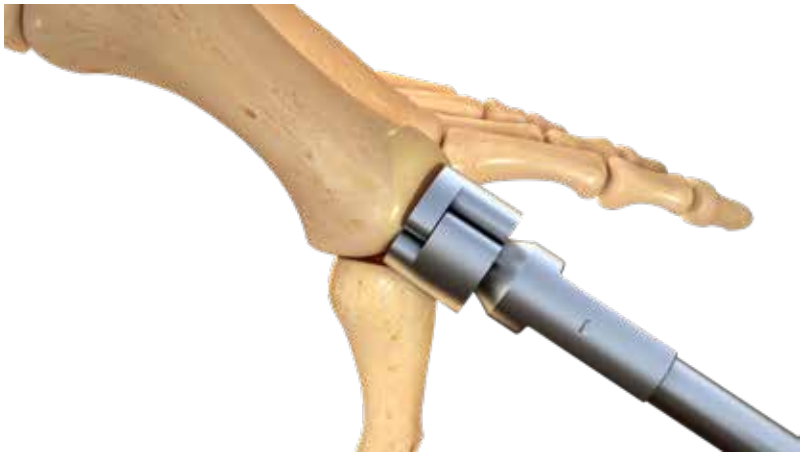

FIGURE 7

Attach the Targeting Guide (SMN10007) to the implant holder. The Guide Sleeve (SMN10003) and Trocar (SMN10004) are placed into the Targeting Guide and used to determine where the incision is needed for the cross screw. An incision is made to accommodate the Guide Sleeve. **FIGURE 8**

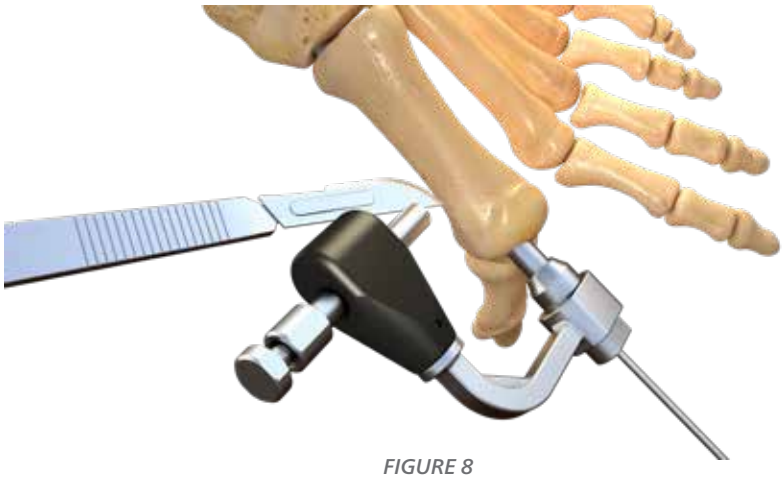

FIGURE 8

Push the Guide Sleeve and Trocar down to bone once the incision is made. The trocar is removed and the Drill Guide (SMN10002) is inserted into the Guide Sleeve prior to drilling. The 2.8mm Drill (SMN10010) is used to pre-drill for the 3.5mm Screw. Drill through both cortices and measure for screw length using the markings on the drill in relation to the Drill Guide. **FIGURE 9**

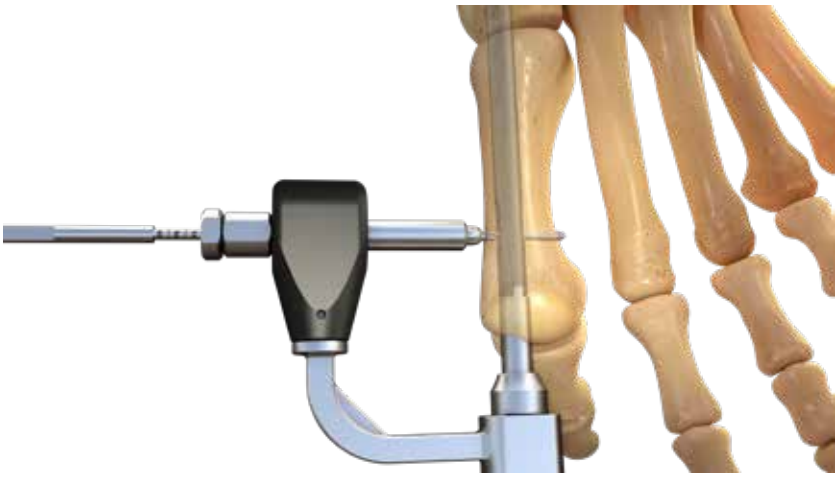

FIGURE 9

Connect the Ratcheting Handle (40120028) to the Star 15 Driver (SMN10006). Remove the Drill Guide and insert the 3.5mm Screw, passing through the compression slot on the nail. Insert the Screw until the head is seated on the near cortex and the screw is bicortical. **FIGURE 10**

IMPORTANT NOTE: 3.5mm Cross Screws should always be bi-cortical.

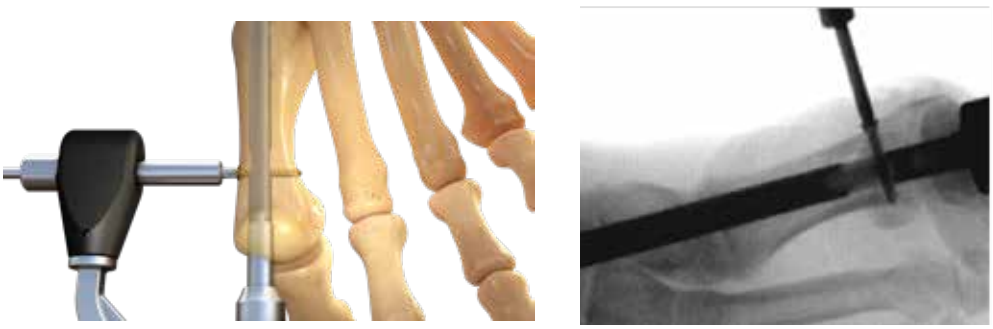

FIGURE 10

The Star 15 Driver is placed through the implant holder and used to achieve compression. Advance the 6mm internal compression screw to achieve desired compression. **FIGURE 11**

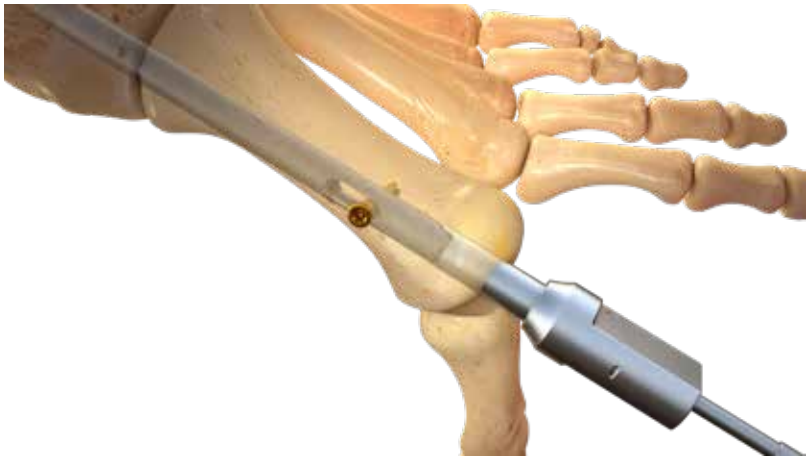

FIGURE 11

The compression slot allows for up to 8mm of internal compression. Care should be taken to not over compress. The construct should never be compressed in such a manner as to allow for the driving end of the nail to sit proud. **FIGURE 12**

FIGURE 12

Remove the Implant Holder from the implant using the Star 30 driver and the procedure is complete.

Explant Information

chapter 6

Connect the Implant Holder to the nail using the Star 30 Driver. Utilize the Star 15 Driver to loosen the internal compressing screw turning it counter clockwise. Using the Star 15 Driver, remove the 3.5mm Screw. Connect the Quick Connect Inserter to the Nail Holder and extract the nail by turning it counter clockwise.

Postoperative Care

chapter 7

Postoperative care is left to the discretion of the surgeon.

Ordering Information

chapter 8

SALVATION™ 2 Midfoot Nail SMN1KITA

Item Number	Description
SMN08060	Cannulated Nail 8mm x 60mm
SMN08065	Cannulated Nail 8mm x 65mm
SMN08070	Cannulated Nail 8mm x 70mm
SMN08075	Cannulated Nail 8mm x 75mm
SMN08080	Cannulated Nail 8mm x 80mm
SMN08085	Cannulated Nail 8mm x 85mm
SMN08090	Cannulated Nail 8mm x 90mm
SMN08095	Cannulated Nail 8mm x 95mm
SMN08100	Cannulated Nail 8mm x 100mm
SMN08105	Cannulated Nail 8mm x 105mm
SMN08110	Cannulated Nail 8mm x 110mm
SMN08115	Cannulated Nail 8mm x 115mm
SMN08120	Cannulated Nail 8mm x 120mm
SMN08125	Cannulated Nail 8mm x 125mm
SMN08130	Cannulated Nail 8mm x 130mm
SMN08135	Cannulated Nail 8mm x 135mm
SMN08140	Cannulated Nail 8mm x 140mm
SMN08145	Cannulated Nail 8mm x 145mm
SMN08150	Cannulated Nail 8mm x 150mm
SMN08155	Cannulated Nail 8mm x 155mm
SMN08160	Cannulated Nail 8mm x 160mm

Item Number	Description
58813514	Low Profile Cort Screw 3.5 x 14mm
58813516	Low Profile Cort Screw 3.5 x 16mm
58813518	Low Profile Cort Screw 3.5 x 18mm
58813520	Low Profile Cort Screw 3.5 x 20mm
58813522	Low Profile Cort Screw 3.5 x 22mm
58813524	Low Profile Cort Screw 3.5 x 24mm
58813526	Low Profile Cort Screw 3.5 x 26mm
58813528	Low Profile Cort Screw 3.5 x 28mm
58813530	Low Profile Cort Screw 3.5 x 30mm
58813532	Low Profile Cort Screw 3.5 x 32mm
58813534	Low Profile Cort Screw 3.5 x 34mm
58813536	Low Profile Cort Screw 3.5 x 36mm
58813538	Low Profile Cort Screw 3.5 x 38mm
58813540	Low Profile Cort Screw 3.5 x 40mm
SMN10006	Star 15 Driver
SMN10017	K-Wire 2.4 x 250
SMN10010	2.8mm Drill
SB080050	5.0mm Drill
SMN10018	8.0mm Step Drill
MT5670AC	STAR 30 Straight Wall HEXSTAR™

SALVATION™ 2 Midfoot Nail SMN1KIT1

Item Number	Description
SMN10001	5mm Spacer assembly
SMN10002	Drill Sleeve
SMN10003	Guide Sleeve
SMN10004	Trocar
SMN10007	Targeting Guide Assembly
SMN10008	Implant Holder Assembly
SMN10009	Quick Connect Inserter
SMN10012	Tissue Protector
SMN10016	Nail Depth Gauge
40120028	CLAW™ Ratcheting Driver Handle
5362000160	Depth Gauge 60mm
SB090009	T-Handle Ratcheting

Notes

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