



## Treace Medical Concepts Screw Fixation System

### Surgical Technique

- Lapidus Fusion, 1<sup>st</sup> MTP Fusion, and Akin Osteotomy
- Distal Osteotomy

# Lapidus Fusion

The Treace Medical Concepts (TMC) Screw Fixation System is composed of a cannulated screw, available in a variety of diameters and lengths in headed and headless versions. The correct screw selection for the procedure is extremely important, and preoperative consideration of the proper screw size and design will increase the potential for surgical success. For illustrative purposes, the following surgical technique describes a Lapidus fusion using 3.0mm and/or 3.5mm headed screws.

**Note:** Though the TMC fixation screws are designed as permanent implants, they may be removed intra or post-operatively as deemed necessary by the physician using the appropriate size hexalobular screw driver.

**Caution:** Proper handling and care should be taken when handling sharp devices.

## *Surgical Approach*

1. Perform a longitudinal skin incision over the 1<sup>st</sup> tarsometatarsal (TMT) joint. Release the plantar ligaments and prepare the joint surfaces for fusion by removing the cartilage and subchondral bone until bleeding subchondral bone is visualized.

## *K-wire Placement*

2. Position the metatarsal in corrected alignment and provisionally fixate the TMT joint using threaded olive wire(s) and/or straight k-wire(s).
3. Using power, insert the 1.1mm (or appropriate size) k-wire in the desired trajectory across the fusion site from the distal-dorsal to proximal-plantar direction, until the desired depth is reached. Confirm the k-wire positioning using fluoroscopy.

**Caution:** Care must be taken to ensure the k-wire is placed a sufficient distance from the TMT joint to avoid fracturing the bone.

## *Countersinking*

**Note:** Countersinking is an optional step and can be performed before or after drilling.

4. To ensure complete seating of the headed screws, the 5.0mm (or appropriate size) countersink may be used. Slide the countersink over the k-wire and advance the countersink in a clockwise motion to penetrate the cortex of the bone.

**Note:** If using the fully threaded screw, the depth gauge countersink instrument is used to countersink.

**Caution:** Removing too much bone with the countersink can cause loss of screw head purchase and diminish the compression effect of the screw.

## *Drilling*

Note: The TMC Screw Fixation System has been designed to be self-drilling and self-tapping. However, in some situations such as hard cortical bone, or when an oblique approach is desired, drilling may be necessary.

5. Select the 2.0mm (or appropriate size) cannulated drill and slide the drill over the k-wire. Under power, advance the drill until the desired screw depth is achieved.

## *Screw Length Determination*

6. Determine the desired screw length by referencing the depth markings on the drill and/or the k-wire. If using the fully threaded screw, the depth gauge countersink instrument may be used to determine the desired screw length.

## *Screw Insertion*

7. Advance the 3.0mm screw (or appropriate size) over the k-wire using a cannulated #15 (or appropriate size) hexalobular screwdriver until the head of the screw is completely seated in the bone. Verify final position via fluoroscopy. Remove the k-wire.
8. A second screw may be placed across the TMT joint as deemed necessary by the surgeon. It is recommended to place the screw from a proximal-dorsal to distal-plantar direction. Implant the second screw following same steps as described for the first screw.

**Caution:** Care must be taken to ensure the second screw is placed a sufficient distance from the first screw to avoid creating a stress riser.

## *Transverse Screw Insertion*

9. If additional transverse-plane stabilization is desired, a 3.5mm (or appropriate size) screw may be placed from the medial cuneiform to intermediate cuneiform or 2<sup>nd</sup> metatarsal; or from the base of the 1<sup>st</sup> metatarsal to 2<sup>nd</sup> metatarsal. Implant the transverse screw following same steps as described for the first screw.

# 1st Metatarsophalangeal (MTP) Fusion

The Treace Medical Concepts (TMC) Screw Fixation System is composed of a cannulated screw, available in a variety of diameters and lengths in headed and headless versions. The correct screw selection for the procedure is extremely important, and preoperative consideration of the proper screw size and design will increase the potential for surgical success. For illustrative purposes, the following surgical technique describes an MTP fusion using 4.0mm headless screws.

**Note:** Though the TMC fixation screws are designed as permanent implants, they may be removed intra or post-operatively as deemed necessary by the physician using the appropriate screwdriver.

## *Surgical Approach*

1. Access the MTP joint and denude all cartilage surfaces with a rongeur or using your preferred method until bleeding subchondral bone is exposed.

## *K-wire Placement*

2. Provisionally fixate and pre-compress the metatarsal and phalanx bones together in proper alignment using threaded olive wire(s) and/or straight K-wire(s).

**Note:** Autograft or allograft may be utilized as needed to enhance fusion potential.

3. Using power, insert the 1.6mm (or appropriate size) k-wire in the desired trajectory across the fusion site, until the desired depth is reached. Confirm the k-wire positioning using fluoroscopy.

**Caution:** Care must be taken to ensure the k-wire is placed a sufficient distance from the MTP joint to avoid fracturing the bone.

## *Countersinking*

**Note:** Countersinking is an optional step and can be performed before or after drilling.

4. To ensure complete seating of the headless screws, the appropriately size countersink may be used. Slide the countersink over the k-wire and advance the countersink in a clockwise motion to penetrate the cortex of the bone.

**Caution:** Removing too much bone with the countersink can cause loss of screw head purchase and diminish the compression effect of the screw.

## *Drilling*

**Note:** The TMC Screw Fixation System has been designed to be self-drilling and self-tapping. However, in some situations such as hard cortical bone, or when an oblique approach is desired, drilling may be necessary.

5. Select the 2.9mm (or appropriate size) cannulated drill and slide the drill over the k-wire. Under power, advance the drill until the desired screw depth is achieved.

#### *Screw Length Determination*

6. Determine the desired screw length by referencing the depth markings on the drill and/or the k-wire. The depth gauge countersink instrument may be used to determine the desired screw length.

#### *Screw Insertion*

7. Advance the 4.0mm screw (or appropriate size) over the k-wire using the appropriate size screwdriver until the head of the screw is completely seated in the bone. Verify final position via fluoroscopy. Remove the k-wire.
8. A second screw may be placed across the MTP joint as deemed necessary by the surgeon. Implant the second screw following same steps as described for the first screw.

**Caution:** Care must be taken to ensure the second screw is placed a sufficient distance from the first screw to avoid creating a stress riser.

# Akin Osteotomy

The TMC Screw Fixation System is composed of a cannulated screw, available in a variety of diameters and lengths in headed and headless versions. The correct screw selection for the procedure is extremely important, and preoperative consideration of the proper screw size and design will increase the potential for surgical success. For illustrative purposes, the following surgical technique describes an Akin osteotomy using 2.5mm headless screws.

**Note:** Though the TMC fixation screws are designed as permanent implants, they may be removed intra or post-operatively as deemed necessary by the physician using the appropriate size hexalobular screw driver.

**Caution:** Proper handling and care should be taken when handling sharp devices.

## *Surgical Approach*

1. Perform a longitudinal skin incision medially over the proximal phalanx. Using a powered saw, perform a closing wedge osteotomy in the phalanx for a transverse-plane correction of the phalanx alignment.

## *K-wire Placement*

2. Manually reduce the osteotomy site, and under power, insert the 0.9mm k-wire across the osteotomy site from the proximal-medial to distal-lateral direction until the desired depth is reached. Confirm the k-wire positioning using fluoroscopy.

## *Countersinking*

**Note:** Countersinking is an optional step.

3. To ensure complete seating of the headless screws, the 2.5mm countersink may be used. Slide the countersink over the k-wire, and advance the countersink in a clockwise motion to penetrate the cortex of the bone. Advance the countersink in a clockwise motion to penetrate the cortex of the bone.

**Caution:** Removing too much bone with the countersink can cause loss of screw head purchase and diminish the compression effect of the screw.

## *Screw Length Determination*

4. Determine the desired screw length by referencing the depth markings on the k-wire.

### *Screw Insertion*

5. Advance the 2.5mm (or appropriate size) screw over the k-wire using a cannulated #8 hexalobular screwdriver until the head of the screw is completely seated in the bone. Verify final position via fluoroscopy. Remove the k-wire.

# 1<sup>st</sup> Metatarsal Distal Osteotomy

The TMC Screw Fixation System is composed of a cannulated screw, available in a variety of diameters and lengths in headed and headless versions. The correct screw selection for the procedure is extremely important, and preoperative consideration of the proper screw size and design will increase the potential for surgical success. For illustrative purposes, the following surgical technique describes a 1<sup>st</sup> Metatarsal Distal Osteotomy using 4.0mm headless screws.

Note: Though the TMC fixation screws are designed as permanent implants, they may be removed intra or post-operatively as deemed necessary by the physician using the appropriate screwdriver.

## *Surgical Approach*

1. Perform an appropriately sized incision and use a cutting device to perform a complete osteotomy through the 1<sup>st</sup> metatarsal.

## *Correction*

2. Using the Inserter, an alternative instrument, and/or manual manipulation, make desired transverse, sagittal and frontal plane adjustments to position the metatarsal head in corrected alignment.

## *K-wire Placement*

3. Using power, insert the 1.6mm (or appropriate size) k-wire in the desired trajectory across the osteotomy site, until the desired depth is reached. Confirm the k-wire positioning using fluoroscopy.

**Caution:** Care must be taken to ensure the k-wire is placed a sufficient distance from the osteotomy site to avoid fracturing the bone.

## *Drilling*

Note: The TMC Screw Fixation System has been designed to be self-drilling and self-tapping. However, in some situations such as hard cortical bone, or when an oblique approach is desired, drilling may be necessary.

4. Select the 2.9mm (or appropriate size) cannulated drill and slide the drill over the k-wire. Under power, advance the drill until the desired screw depth is achieved.

## *Screw Length Determination*

5. Determine the desired screw length by referencing the depth markings on the drill and/or the k-wire. If using the fully threaded screw, the depth gauge countersink instrument may be used to determine the desired screw length.



### *Screw Insertion*

6. Advance the 4.0mm screw (or appropriate size) over the k-wire using the appropriate size screwdriver until the head of the screw is completely seated in the bone. Verify final position via fluoroscopy. Remove the k-wire.
7. A second screw may be placed across the osteotomy site as deemed necessary by the surgeon. Implant the second screw following the same steps as described for the first screw.

**Caution:** Care must be taken to ensure the second screw is placed a sufficient distance from the first screw to avoid creating a stress riser.

### *Medial Spike Removal*

8. Using a desired instrument, remove the remaining medial prominence.

