2.4 mm Cannulated Screw
Technique Guide

An Integral Part of the
SYNTHES Stainless Steel
Cannulated Screw System
The 2.4 mm Self-drilling, Self-tapping Cannulated Screw

- 3.5 mm head diameter
- Implant quality 316L stainless steel
- 1.7 mm core diameter
- 0.9 mm cannulation
- 1.0 mm thread pitch
- 2.4 mm thread diameter
- Self-drilling, self-tapping flutes
- 0.8 mm guide wire, made of high-strength cobalt chrome alloy
- 1.0 mm thread pitch
- 0.9 mm cannulation

StarDrive recess
- T8 StarDrive recess improves torque transmission and allows easy removal
- Mates with self-retaining screwdriver

Short thread (1/4 the shaft length)
Long thread (1/2 the shaft length)
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## The 2.4 mm Self-drilling, Self-tapping Cannulated Screw

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Indications

- Intra-articular fractures of the carpals, metacarpals, tarsals and metatarsals
- Fixation of small bone fragments
- Bunionectomies and osteotomies
- Arthrodeses of small joints

**Warning:** This device is not approved for screw attachment or fixation to the posterior elements (pedicles) of the cervical, thoracic, or lumbar spine.
AO Principles

In 1958, the AO ASIF (Association for the Study of Internal Fixation) formulated four basic principles,¹ which have become the guidelines for internal fixation:

**Anatomic Reduction**

A guide wire marks the prescribed path for the cannulated screw and secures alignment of the fragments while the screw is being inserted. The cannulated screw is inserted over the wire and tightened to further compress the fragments and hold the reduction.

**Stable Fixation**

Cannulated screws provide interfragmentary compression and absolute stability across the fracture. The screws are available in different thread lengths, allowing the surgeon to optimize purchase in the far fragment for maximum compression and stability.

**Preservation of Blood Supply**

The use of small diameter guide wires allows precise placement of cannulated screws through small incisions. This technique minimizes disruption of soft tissue and preserves vascular blood flow for bone healing.

**Early Mobilization**

Cannulated screws, combined with AO technique, provide stable fracture fixation with minimal trauma to vascular supply. This helps to create an improved environment for bone healing, accelerating the patient’s return to previous mobility and function.

Surgical Technique

Scaphoid

1  Insert guide wire into the scaphoid

Insert a 0.8 mm Guide Wire [292.619] through the 1.7 mm/0.8 mm Double Drill Sleeve [312.145] to the appropriate depth, under image intensification.

Remove the drill sleeve and check the position of the guide wire and reduction using image intensification.

Technique Tip: Insertion of the 0.8 mm guide wire may be easier using a pen-style drive unit rather than a pistol-grip drive unit, to prevent wire bending. Insert the guide wire in 10 to 15 mm increments to minimize the possibility of bending the wire.

2  Predrill for the screw (optional)

Predrilling in the near cortex is recommended in dense cortical bone, as the axial force necessary for inserting self-drilling screws could temporarily distract the fragments at the fracture site.

In some cases, especially in cancellous bone, the self-drilling flutes of the 2.4 mm Cannulated Screw make predrilling unnecessary.

Use the 1.7 mm Cannulated Drill Bit [310.215] with the 1.7 mm/0.8 mm Double Drill Sleeve [312.145] to drill the near cortex only. Use image intensification if necessary.
3 **Countersink**

In areas where soft tissue coverage is minimal or in thick cortical bone, use the Cannulated Countersink [310.803] with the Handle [311.43] to create a recess for the screw head.

Countersinking also facilitates screw insertion if predrilling is not performed.

4 **Measure**

Slide the tapered end of the Measuring Device [319.703] over the guide wire and down to the bone.

The reading on the measuring device indicates the appropriate screw length to place the screw tip at the end of the guide wire. Subtract appropriately for any anticipated fracture reduction or interfragmentary compression resulting from screw insertion.

5 **Insert screw**

Use the self-retaining Cannulated T8 StarDrive Screwdriver Shaft [314.466] with the Handle [311.43] to insert the screw. After the screw is seated, remove and discard the guide wire.

**Note:** Avoid removal and reinsertion of the screw in the same hole. The self-drilling feature of the screw can damage bone threads during reinsertion.

**Note:** Inserting the screw under power is not recommended.
Surgical Technique

Compression Screw in Proximal Phalanx

1. Insert guide wire into the bone

Insert a 0.8 mm Guide Wire [292.619] through the 1.7 mm/0.8 mm Double Drill Sleeve [312.145] to the appropriate depth. Remove the drill sleeve and check the position of the guide wire and reduction using image intensification.

**Technique Tip:** Insertion of the 0.8 mm guide wire may be easier using a pen-style drive unit rather than a pistol-grip drive unit, to prevent wire bending. Insert the guide wire in 10 to 15 mm increments to minimize the possibility of bending the wire.

2. Predrill for the screw (optional)

Predrilling in the near cortex is recommended in dense cortical bone, as the axial force necessary for inserting self-drilling screws could temporarily distract the fragments at the fracture site.

In some cases, especially in cancellous bone, the self-drilling flutes of the 2.4 mm Cannulated Screw make predrilling unnecessary.

Use the 1.7 mm Cannulated Drill Bit [310.215] with the 1.7 mm/0.8 mm Double Drill Sleeve [312.145] to drill the near cortex only. Use image intensification if necessary.
3 Countersink

In areas where soft tissue coverage is minimal or in thick cortical bone, use the Cannulated Countersink [310.803] with the Handle [311.43] to create a recess for the screw head.

Countersinking also facilitates screw insertion if predrilling is not performed.

4 Measure for screw length

Slide the tapered end of the Measuring Device [319.703] over the guide wire and down to the bone.

The reading on the measuring device indicates the appropriate screw length to place the screw tip at the end of the guide wire. Subtract appropriately for any anticipated reduction or interfragmentary compression resulting from screw insertion.

5 Insert screws

Use the self-retaining Cannulated T8 StarDrive Screwdriver Shaft [314.466] with the Handle [311.43] to insert the screw. After the screw is seated, remove and discard the guide wire.

Note: A second screw or a K-wire may be inserted to provide rotational stability.

Note: Avoid removal and reinsertion of the screw in the same hole. The self-drilling feature of the screw can damage bone threads during reinsertion.

Note: Inserting the screws under power is not recommended.
Surgical Technique

Arthrodesis

1 Prepare bone surfaces

Prepare bone surfaces for the arthrodesis by removing the cartilage and subchondral bone as necessary.

2 Insert guide wire into the bone

Insert a 0.8 mm Guide Wire [292.619] through the 1.7 mm/0.8 mm Double Drill Sleeve [312.145] to the appropriate depth, under image intensification.

Remove the drill sleeve.

Technique Tip: Insertion of the 0.8 mm guide wire may be easier using a pen-style drive unit rather than a pistol-grip drive unit, to prevent wire bending. Insert the guide wire in 10 to 15 mm increments to minimize the possibility of bending the wire.

3 Drill

Drill completely through the near bone and the near cortex of the far bone using the 1.7 mm Cannulated Drill Bit [310.215] through the 1.7 mm/0.8 mm Double Drill Sleeve [312.145].
4 Countersink

Use the Cannulated Countersink [310.803] and Handle [311.43] to create a recess for the screw head.

5 Measure for screw length

Slide the tapered end of the Measuring Device [319.703] over the guide wire and down to the bone.

The reading on the measuring device indicates the appropriate screw length to place the screw tip at the end of the guide wire.

6 Insert screw

Use the self-retaining Cannulated T8 StarDrive Screwdriver Shaft [314.466] with the Handle [311.43] to insert the screw. After the screw is seated, remove and discard the guide wire.
Cleaning and Screw Removal

Cleaning Cannulation

Cleaning the instrument cannulations is imperative for proper function and component life.

Instruments should be cleared intraoperatively with the 0.8 mm Cleaning Stylet [319.293] to prevent accumulation of debris in the cannulations and potential binding of the instruments on the guide wire. Instruments should be cleaned postoperatively with the stylet and 1.0 mm Cleaning Brush [319.289].

Screw Removal

The Cannulated StarDrive Screwdriver Shaft is significantly stronger than the screw, so a solid driver may not be necessary. Insertion of a wire into the screw cannulation can assist in determining the screw axis to aid in proper screwdriver alignment.
Implants

2.4 mm Cannulated Screws, long thread
[211.810–211.830]
10 mm–20 mm, 1 mm increments
22 mm–30 mm, 2 mm increments

2.4 mm Cannulated Screws, short thread
[211.841–211.849]
17 mm–20 mm, 1 mm increments
22 mm–30 mm, 2 mm increments

Instruments

0.8 mm Guide Wire, 100 mm [292.619]

1.7 mm/0.8 mm Double Drill Sleeve [312.145]

1.7 mm Cannulated Drill Bit [310.215]
For predrilling in dense bone

Cannulated Countersink [310.803]
Creates a recess for the screw head

Measuring Device [319.703]
For 2.4 mm Cannulated Screws
Instruments (continued)

Cannulated StarDrive Screwdriver Shaft [314.466]
Used for insertion and removal of 2.4 mm Cannulated Screws with StarDrive recess

StarDrive Screwdriver Shaft, T8 [314.467]

Handle, with quick coupling [311.43]
Used with StarDrive screwdriver shafts [314.466] and [314.467]

Screw and Plate Forceps [347.985]

1.0 mm Cleaning Brush [319.289]
For postoperative cleaning of the cannulations of 2.4 mm Cannulated Screw instruments

0.8 mm Cleaning Stylet [319.293]
For intraoperative clearing of cannulated instruments
2.4 mm Cannulated Screw Instrument and Implant Set [105.175]

**Implants**

- **211.810** 2.4 mm Cannulated Screws, long thread
  - 10 mm–16 mm, 4 ea., 1 mm increments
  - 17 mm–20 mm, 2 ea., 1 mm increments
  - 22 mm–30 mm, 2 ea., 2 mm increments

- **211.841** 2.4 mm Cannulated Screws, short thread*
  - 17 mm–20 mm, 2 ea., 1 mm increments
  - 22 mm–30 mm, 2 ea., 2 mm increments

- **292.619** 0.8 mm Guide Wire, 100 mm (1 pkg. of 10)

**Instruments**

- **310.215** 1.7 mm Cannulated Drill Bit, quick coupling,
  - 100 mm, 2 ea.

- **310.803** Cannulated Countersink, for 2.4 mm Cannulated Screws

- **311.43** Handle, with quick coupling

- **312.145** 1.7 mm/0.8 mm Double Drill Sleeve

- **314.466** Cannulated StarDrive Screwdriver Shaft, T8, 2 ea.

- **314.467** StarDrive Screwdriver Shaft, T8

- **319.289** 1.0 mm Cleaning Brush

- **319.293** 0.8 mm Cleaning Stylet

- **319.703** Measuring Device, for use with 2.4 mm Cannulated Screws

- **347.985** Screw and Plate Forceps

* Short thread lengths:
  - 5 mm thread for screw lengths 17 mm–22 mm
  - 6 mm thread for screw lengths 24 mm–30 mm

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**Sterilization Parameters for Set [105.175]**

This Synthes set with all additionally available items, as marked in the case, can be sterilized by the following parameters. For more information, please see graphic case package insert.

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<th>Exposure Time</th>
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<tr>
<td>Steam</td>
<td>Gravity Displacement (Wrapped)</td>
<td>132°–135°C (270°–275°F)</td>
<td>22 Minutes</td>
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<tr>
<td>Steam</td>
<td>Prevacuum (Wrapped)</td>
<td>132°–135°C (270°–275°F)</td>
<td>8 Minutes</td>
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Original Instruments and Implants of the Association
for the Study of Internal Fixation — AO ASIF