2.4 mm Cannulated Screw.
An integral part of the Synthes Cannulated Screw System (CSS).

Technique Guide
Warning

This description is not sufficient for immediate application of the instrumentation. Instruction by a surgeon experienced in handling this instrumentation is highly recommended.

Processing, Reprocessing, Care and Maintenance

For general guidelines, function control and dismantling of multi-part instruments, as well as processing guidelines for implants, please contact your local sales representative or refer to: www.synthes.com/reprocessing

For general information about reprocessing, care and maintenance of Synthes reusable devices, instrument trays and cases, as well as processing of Synthes non-sterile implants, please consult the Important Information leaflet (SE_023827) or refer to: www.synthes.com/reprocessing
2.4 mm Cannulated Screw.
An integral part of the Synthes Cannulated Screw System (CSS).

0.8 mm guide wire, made of high strength cobalt chrome alloy for increased resistancy to deflection

Ø 3.5 mm low-profile head for minimal soft tissue irritation

Implant quality stainless steel guarantees maximum implant strength and biocompatibility

Titanium alloy TAN for increased biocompatibility

Core diameter:
- steel: 1.7 mm
- TAN: 1.9 mm

2.4 mm thread diameter for maximum purchase

1.0 mm thread pitch allows smooth screw insertion even in hard cortical bone

Self-drilling, self-tapping flutes facilitate surgical technique and save operation time

0.9 mm cannulation

Stardrive T8 recess improves torque transmission and facilitates removal

Two design types

Short thread (¼ of the shaft length)

Long thread (½ of the shaft length)
In 1958, the AO formulated four basic principles, which have become the guidelines for internal fixation.¹

**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 high 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 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.

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.
1

**Insert guide wire into the scaphoid**

**Instruments**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>292.619</td>
<td>0.8 mm Guide Wire</td>
</tr>
<tr>
<td>312.144</td>
<td>Double Drill Guide 1.9/0.8 for screws in TAN</td>
</tr>
<tr>
<td>312.145</td>
<td>Double Drill Guide 1.7/0.8 for screws in steel</td>
</tr>
</tbody>
</table>

Insert the guide wire through the drill guide to the appropriate depth, using image intensification. Remove the drill guide and check the position of the guide wire and reduction.

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

2

**Predrill for the screw (optional)**

**Instruments**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>310.214</td>
<td>Drill Bit Ø 1.9 mm, cannulated, length 100 mm, for screws in TAN</td>
</tr>
<tr>
<td>310.215</td>
<td>Drill Bit Ø 1.7 mm, cannulated, length 100 mm, for screws in steel</td>
</tr>
<tr>
<td>312.144</td>
<td>Double Drill Guide 1.9/0.8 for screws in TAN</td>
</tr>
<tr>
<td>312.145</td>
<td>Double Drill Guide 1.7/0.8 for screws in steel</td>
</tr>
</tbody>
</table>

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 cannulated drill bit with the double drill guide to drill the near cortex only. Use image intensification if necessary.

---

**Scaphoid**
3 Measure

**Instrument**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>319.703</td>
<td>Measuring Device</td>
</tr>
</tbody>
</table>

Slide the tapered end of the measuring device 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.

4 Insert screw

**Instruments**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>314.466</td>
<td>Self-retaining Cannulated Stardrive T8 Screwdriver Shaft</td>
</tr>
<tr>
<td>311.430</td>
<td>Handle</td>
</tr>
</tbody>
</table>

Use the cannulated screwdriver shaft with the handle to insert the screw. After the screw is seated, remove and discard the guide wire.

**Notes**

- Avoid removal and reinsertion of the screw in the same hole. The self-drilling feature of the screw can damage bone threads during reinsertion.
- Inserting the screw under power is not recommended.
1
Insert guide wire into the bone

**Instruments**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>292.619</td>
<td>0.8 mm Guide Wire</td>
</tr>
<tr>
<td>312.144</td>
<td>Double Drill Guide 1.9/0.8 for screws in TAN</td>
</tr>
<tr>
<td>or 312.145</td>
<td>Double Drill Guide 1.7/0.8 for screws in steel</td>
</tr>
</tbody>
</table>

Insert the guide wire through the drill guide to the appropriate depth. Remove the drill guide and check the position of the guide wire and reduction using image intensification.

**Note:** Insertion of the guide wire may be easier using a pen-style drive unit rather than a pistol-grip drive unit. Insert the guide wire in 10 to 15 mm increments to prevent wire bending.
2
Predrill for the screw (optional)

<table>
<thead>
<tr>
<th>Instruments</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>310.214</td>
<td>Drill Bit Ø 1.9 mm, cannulated, length 100 mm, for screws in TAN</td>
</tr>
<tr>
<td>or</td>
<td></td>
</tr>
<tr>
<td>310.215</td>
<td>Drill Bit Ø 1.7 mm, cannulated, length 100 mm, for screws in steel</td>
</tr>
<tr>
<td>312.144</td>
<td>Double Drill Guide 1.9/0.8 for screws in TAN</td>
</tr>
<tr>
<td>or</td>
<td></td>
</tr>
<tr>
<td>312.145</td>
<td>Double Drill Guide 1.7/0.8 for screws in steel</td>
</tr>
</tbody>
</table>

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. If the screw is intended to pass through the opposite cortex as well, predrilling is necessary. In some cases, especially in cancellous bone, the self-drilling flutes of the 2.4 mm Cannulated Screw make predrilling unnecessary.

Use image intensification if necessary.

3
Countersink

<table>
<thead>
<tr>
<th>Instruments</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>310.803</td>
<td>Cannulated Countersink</td>
</tr>
<tr>
<td>311.430</td>
<td>Handle</td>
</tr>
</tbody>
</table>

In areas where soft tissue coverage is minimal or in thick cortical bone, use the cannulated countersink with the handle to create a recess for the screw head.

Countersinking also facilitates screw insertion if predrilling is not performed.
4
Measure for screw length

<table>
<thead>
<tr>
<th>Instrument</th>
<th>desc</th>
</tr>
</thead>
<tbody>
<tr>
<td>319.703</td>
<td>Measuring Device</td>
</tr>
</tbody>
</table>

Slide the tapered end of the measuring device 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

<table>
<thead>
<tr>
<th>Instruments</th>
<th>desc</th>
</tr>
</thead>
<tbody>
<tr>
<td>314.466</td>
<td>Self-retaining Cannulated Stardrive</td>
</tr>
<tr>
<td></td>
<td>T8 Screwdriver Shaft</td>
</tr>
<tr>
<td>311.430</td>
<td>Handle</td>
</tr>
</tbody>
</table>

Use the cannulated screwdriver shaft with the handle to insert the screw. After the screw is seated, remove and discard the guide wire.

Notes
- A second screw or a Kirschner wire may be inserted to provide rotational stability.
- Avoid removal and reinsertion of the screw in the same hole. The self-drilling feature of the screw can damage bone threads during reinsertion.
- Inserting the screws under power is not recommended.
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

<table>
<thead>
<tr>
<th>Instruments</th>
</tr>
</thead>
<tbody>
<tr>
<td>292.619</td>
</tr>
<tr>
<td>312.144 or 312.145</td>
</tr>
</tbody>
</table>

Insert the guide wire through the drill guide under image intensification.

Make sure that the guide wire is positioned centrally within the medullary canal and that the screw will not damage the PIP joint. The best screw purchase is achieved if the threads pass across the narrow zone in the middle of the phalanx.

Remove the drill guide.

**Note:** Insertion of the guide wire may be easier using a pen-style drive unit rather than a pistol-grip drive unit. Insert the guide wire in 10 to 15 mm increments to prevent wire bending.
3
Drill

**Instruments**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>310.214</td>
<td>Drill Bit Ø 1.9 mm, cannulated, length 100 mm, for screws in TAN</td>
</tr>
<tr>
<td>310.215</td>
<td>Drill Bit Ø 1.7 mm, cannulated, length 100 mm, for screws in steel</td>
</tr>
<tr>
<td>312.144</td>
<td>Double Drill Guide 1.9/0.8 for screws in TAN</td>
</tr>
<tr>
<td>312.145</td>
<td>Double Drill Guide 1.7/0.8 for screws in steel</td>
</tr>
</tbody>
</table>

Drill completely through the near bone and the near cortex of the far bone using the cannulated drill bit through the double drill guide.

Use image intensification if necessary.

4
Countersink

**Instruments**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>310.803</td>
<td>Cannulated Countersink</td>
</tr>
<tr>
<td>311.430</td>
<td>Handle</td>
</tr>
</tbody>
</table>

Use the cannulated countersink and handle to create a recess for the screw head.
5
Measure for screw length

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>319.703</td>
<td>Measuring Device</td>
</tr>
</tbody>
</table>

Slide the tapered end of the measuring device 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

<table>
<thead>
<tr>
<th>Instruments</th>
</tr>
</thead>
<tbody>
<tr>
<td>314.466</td>
</tr>
<tr>
<td>311.430</td>
</tr>
</tbody>
</table>

Use the cannulated screwdriver shaft with the handle to insert the screw. After the screw is seated, remove and discard the guide wire.

**Note:** Check rotation of the distal phalanx while tightening the screw.
Cleaning and Screw Removal

Cleaning cannulation

| Instrument | 319.293 | 0.8 mm Cleaning Stylet |

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

Instruments should be cleared intraoperatively with the cleaning stylet to prevent accumulation of debris in the cannulations and potential binding of the instruments on the guide wire.

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.
2.4 mm Cannulated Screws, long thread
(X11.810–X11.830)
10 mm – 20 mm, 1 mm increments
22 mm – 30 mm, 2 mm increments

2.4 mm Cannulated Screws, short thread
(X11.841–X11.849)
17 mm – 20 mm, 1 mm increments
22 mm – 30 mm, 2 mm increments

X = 2: steel
X = 4: TAN
Instruments

0.8 mm Guide Wire, 100 mm (292.619)

Cannulated Drill Bits
– 310.214: Ø 1.9 mm for screws in TAN
– 310.215: Ø 1.7 mm for screws in steel
For predrilling in dense bone

Double Drill Guides
– 312.144: 1.9/0.8 for screws in TAN
– 312.145: 1.7/0.8 for screws in steel

Cannulated Countersink (310.803)
Creates a recess for the screw head

Measuring Device (319.703)
For 2.4 mm Cannulated Screws

Cannulated Stardrive T8 Screwdriver Shaft (314.466)
Used for insertion and removal of 2.4 mm Cannulated Screws

Stardrive T8 Screwdriver Shaft (314.467)

Handle, with Quick Coupling (311.430)
Used with Cannulated Countersink (310.803) and Screwdriver Shafts (314.466 and 314.467)

Screw and Plate Forceps (347.985)

0.8 mm Cleaning Stylet (319.293)
For intraoperative clearing of cannulated instruments
Sets

01.202.002 Instrument Set for Cannulated Screw 2.4 mm (Stainless Steel)
01.202.004 Instrument Set for Cannulated Screw 2.4 mm (TAN)
68.202.000 Module for Instrument Set for Cannulated Screw 2.4 mm, with Lid, without Contents

Implants

Cannulated Screw 2.4 mm, long thread, self-drilling
- X11.810 length 10/4 mm 3 pcs
- X11.811 length 11/5 mm 3 pcs
- X11.812 length 12/5 mm 3 pcs
- X11.813 length 13/6 mm 3 pcs
- X11.814 length 14/6 mm 3 pcs
- X11.815 length 15/7 mm 3 pcs
- X11.816 length 16/7 mm 3 pcs
- X11.817 length 17/8 mm 3 pcs
- X11.818 length 18/8 mm 3 pcs
- X11.819 length 19/9 mm 3 pcs
- X11.820 length 20/9 mm 3 pcs
- X11.822 length 22/10 mm 3 pcs
- X11.824 length 24/10 mm 3 pcs
- X11.826 length 26/12 mm 3 pcs
- X11.828 length 28/12 mm 3 pcs
- X11.830 length 30/14 mm 3 pcs

Cannulated Screw 2.4 mm, short thread, self-drilling
- X11.841 length 17/5 mm 3 pcs
- X11.842 length 18/5 mm 3 pcs
- X11.843 length 19/5 mm 3 pcs
- X11.844 length 20/5 mm 3 pcs
- X11.845 length 22/5 mm 3 pcs
- X11.846 length 24/6 mm 3 pcs
- X11.847 length 26/6 mm 3 pcs
- X11.848 length 28/6 mm 3 pcs
- X11.849 length 30/6 mm 3 pcs
- 292.619 Guide Wire Ø 0.8 mm, length 100 mm 10 pcs

X = 2: steel
X = 4: TAN

Instruments

310.214 Drill Bit Ø 1.9 mm, cannulated, length 100 mm, for Quick Coupling
310.215 Drill Bit Ø 1.7 mm, cannulated, length 100 mm, for Quick Coupling 2 pcs
310.803 Countersink, cannulated, for Cannulated Screws Ø 2.4 mm 1 pcs
311.430 Handle with Quick Coupling, length 110 mm 1 pcs
312.144 or 312.145 Double Drill Guide 1.9/0.8 1 pcs
314.466 Screwdriver Shaft, cannulated, Stardrive T8, self-holding 2 pcs
314.467 Screwdriver Shaft, Stardrive T8, self-holding 1 pcs
319.293 Cleaning Stylet Ø 0.8 mm, for Cannulated Instruments 1 pcs
319.703 Measuring Device for Cannulated Screws Ø 2.4 mm 1 pcs
347.985 Holding Forceps for Cortex Screws Ø 1.0 to 2.4 mm 1 pcs