

Part of the DePuy Synthes Cannulated Screw System

3.0 mm Cannulated Screws

Surgical Technique



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MR Information

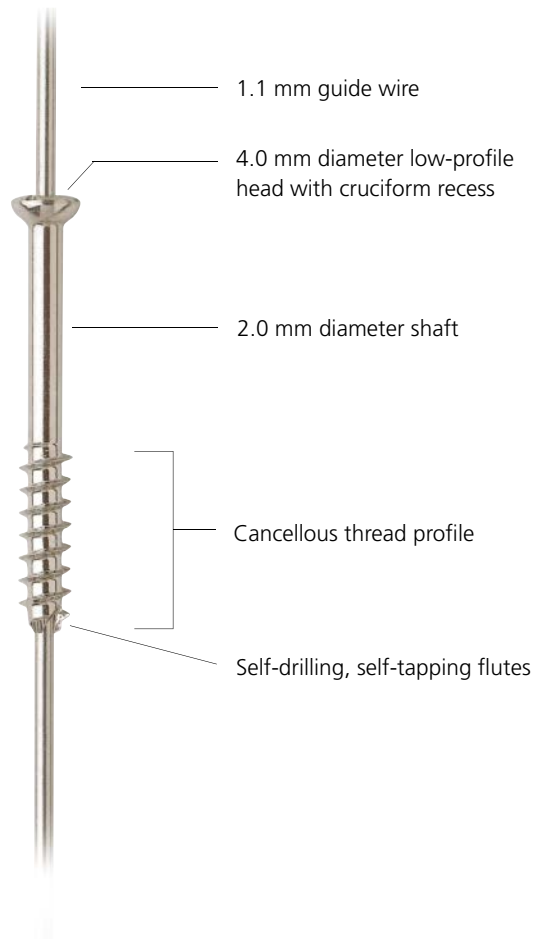
The 3.0 mm Cannulated Screw System has not been evaluated for safety and compatibility in the MR environment. It has not been tested for heating, migration or image artifact in the MR environment. The safety of the 3.0 mm Cannulated Screw System in the MR environment is unknown. Scanning a patient who has this device may result in patient injury.

 Image intensifier control

3.0 mm Cannulated Screws

Features

- Cannulated shaft accepts 1.1 mm diameter guide wires (threaded and non-threaded wires available)
- Low-profile head with cruciform drive recess reduces possibility of soft tissue irritation
- Threaded washer option allows complete burial of screw head into articular surfaces, while still achieving a high degree of compression
- Choice of thread lengths offers best fit of threads into far bone fragment, for greater interfragmentary compression
- Cancellous thread profile uses deep cutting threads with a large pitch to increase resistance to pullout. The large pitch also accelerates screw insertion and removal
- Self-drilling, self-tapping screw tip facilitates screw insertion by eliminating the need for predrilling and tapping in most cases



Thread Lengths

- Short thread (thread length = 1/3 screw length)
- Long thread (thread length = 1/2 screw length)



Materials

- Implant-quality 316L stainless steel
- Titanium alloy Ti-6Al-7Nb

Threaded Washers

The threaded washer allows use of the 3.0 mm cannulated screw in indications requiring a completely recessed screw head.

- Provides a recessed, internal buttress to allow the screw head to be buried beneath the articular surface.
- Allows the surgeon to optimize compression at the fracture/osteotomy site through the mechanics of standard lag screw technique, even when recessing the screw head below the cortical surface.



Features

- Internal hexagonal drive accepts 3.2 mm cannulated washer driver
- 5.5 mm diameter cancellous thread profile provides buttress for interfragmentary compression during screw tightening
- 3.0 mm high cancellous thread profile inserts quickly
- Self-drilling, self-tapping flutes also facilitate insertion
- Implant-quality 316L stainless steel or titanium alloy (Ti-6Al-7Nb)



AO Principles

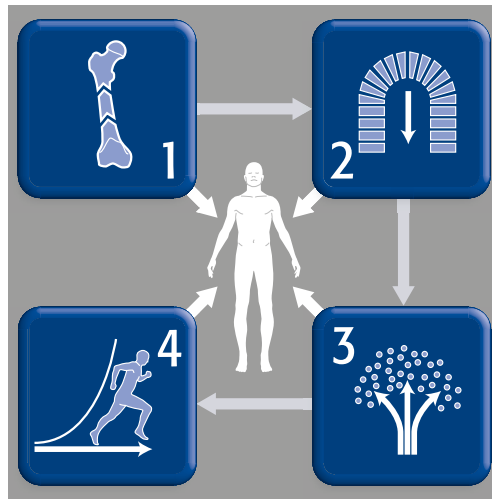
In 1958, the AO formulated four basic principles, which have become the guidelines for internal fixation.^{1,2}

Anatomic reduction

Fracture reduction and fixation to restore anatomical relationships.

Early, active mobilization

Early and safe mobilization and rehabilitation of the injured part and the patient as a whole.



Stable fixation

Fracture fixation providing absolute or relative stability, as required by the patient, the injury, and the personality of the fracture.

Preservation of blood supply

Preservation of the blood supply to soft tissues and bone by gentle reduction techniques and careful handling.

1. Müller ME, Allgöwer M, Schneider R, Willenegger H. *Manual of Internal Fixation*. 3rd ed. Berlin, Heidelberg, New York: Springer-Verlag; 1991.
2. Rüedi TP, RE Buckley, CG Moran. *AO Principles of Fracture Management*. 2nd ed. Stuttgart New York: Thieme; 2007.

Indications

The Synthes 3.0 mm cannulated screw, used with the threaded washer, is generally intended for intra-articular fixation of small bones, such as the hand, wrist and forefoot.

Specifically, it is intended for:

- Fractures of carpals and metacarpals
- Carpal and metacarpal arthrodesis
- Small fragments of the hand and wrist
- Certain metatarsal phalangeal applications

The Synthes 3.0 mm cannulated screw, used alone, is intended for fixation of small bones, such as the hand, wrist and forefoot.

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



Scaphoid fracture
(with washer)



Scaphoid fracture
(without washer)



Fracture at base of
fifth metacarpal



Metatarsophalangeal
arthrodesis



Distal radius fracture



Radial head fracture
(with washer)

Technique With Threaded Washer

1

Preparation

Cleaning cannulations

Instrument

319.292 1.1 mm Cleaning Stylet

Cleaning the instrument cannulations is imperative for proper function. Instruments should be cleared intraoperatively with the 1.1 mm cleaning stylet to prevent accumulation of debris in the cannulations and potential binding of the instruments to the guide wire. Instruments should be cleaned postoperatively with the stylet and cleaning brush.

Predrilling

The self-drilling flutes of the 3.0 mm cannulated screw make predrilling unnecessary in most cases. However, predrilling is recommended in dense bone and in arthrodeses, as the axial force necessary for inserting self-drilling screws could temporarily distract the fragments at the fracture/arthrodesis line.

2

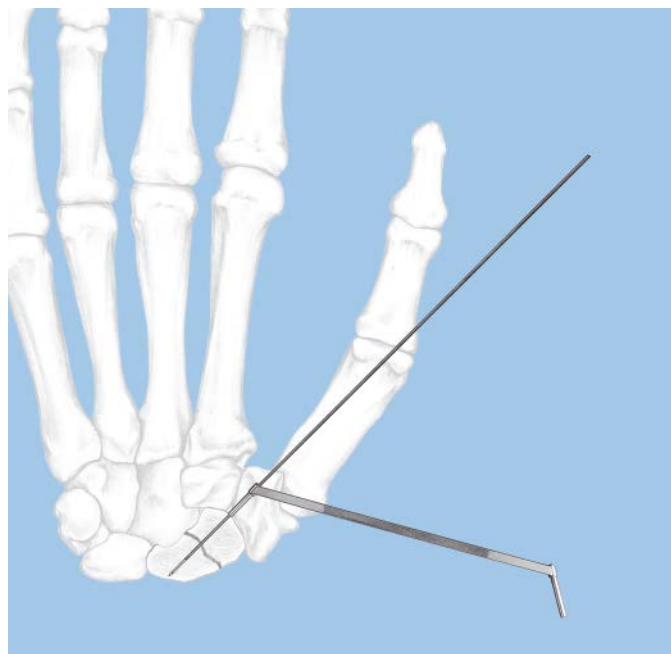
Insert guide wire

Instruments

292.622 or 1.1 mm Guide Wire
292.623 (threaded or non-threaded)

312.151 2.0 mm/1.1 mm Double Drill Sleeve

- 1 Insert a 1.1 mm threaded guide wire through the 2.7 mm/1.25 mm double drill sleeve to the appropriate depth. Check placement of the wire under image intensification. Remove the drill sleeve.



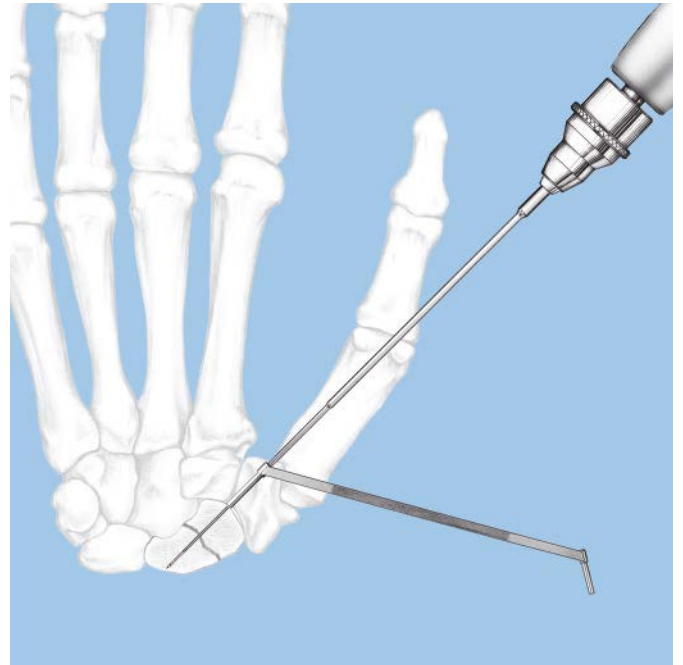
3

Predrill for the screw (optional)

Instruments

310.221	2.0 mm Cannulated Drill Bit
312.151	2.0 mm/1.1 mm Double Drill Sleeve

The self-drilling flutes of the 3.0 mm cannulated screw make predrilling unnecessary in most cases. However, predrilling is recommended in dense bone and in arthrodeses, as the axial force necessary for inserting self-drilling screws could temporarily distract the fragments at the fracture/arthrodesis line. In fracture fixation, use the 2.0 mm cannulated drill bit through the 2.0 mm/1.1 mm double drill sleeve to drill the near cortex only. In arthrodesis, drill completely through the near bone and through the near cortex of the far bone.



4

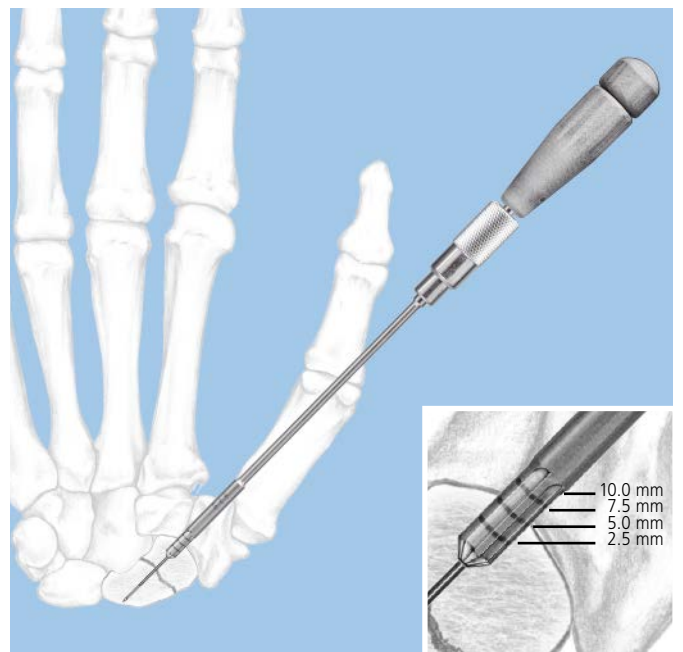
Create a recess for the threaded washer

Instruments

310.804	Cannulated Countersink
312.153	5.5 mm/4.3 mm Double Drill Sleeve

Use the cannulated countersink through the 5.5 mm/4.3 mm double drill sleeve to create a recess in the bone for the threaded washer. In dense bone, ream approximately 7.5 mm deep (see inset). In soft bone, simply ream the near cortex. Careful power-reaming is recommended, as it provides a more precise hole than hand-reaming.

Note: The threaded washer provides a buttress for a buried screw head.



5

Insert the threaded washer

Instrument

314.464 Cannulated Driver for Threaded Washers

Use the cannulated driver for threaded washers to insert the threaded washer deep enough to allow the screw head to be buried beneath the near cortex. The threaded washer should seat in the reamed hole.

Note: Make sure the shortest distance between the support screw and the bone surface is approximately 3 mm.



6

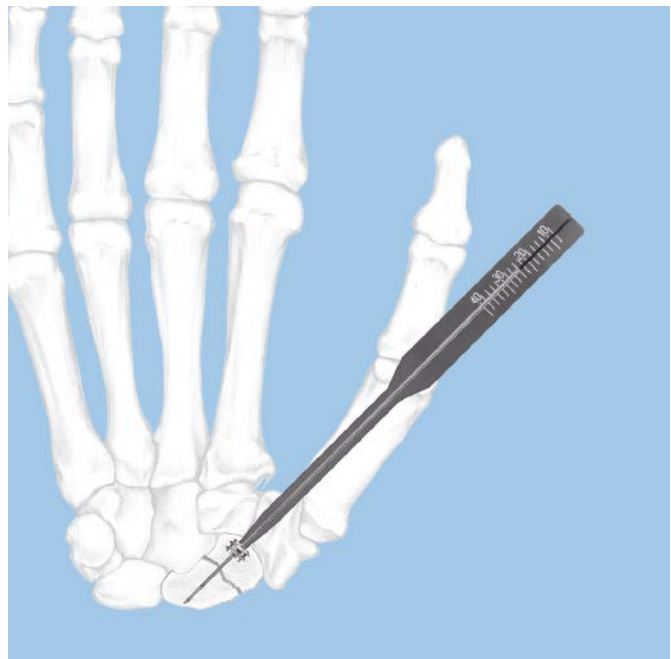
Measure

Instrument

319.702 Cannulated Screw Measuring Device

Slide the tapered end of the cannulated screw measuring device over the guide wire and into the threaded washer. Read the scale at the end of the wire to determine insertion depth, and add 3 mm to account for the threaded washer.

Note: This measurement indicates the appropriate screw length to place the screw at the tip of the guide wire. Subtract appropriately for any anticipated interfragment compression resulting from screw insertion.



7

Insert the screw

Instrument

313.969 Holding Sleeve (for 314.463)

314.463 Cannulated Cruciform Screwdriver

Use the cannulated cruciform screwdriver and holding sleeve to insert the appropriate length screw over the guide wire. Once 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.



Technique Without Threaded Washer

1

Insert a guide wire

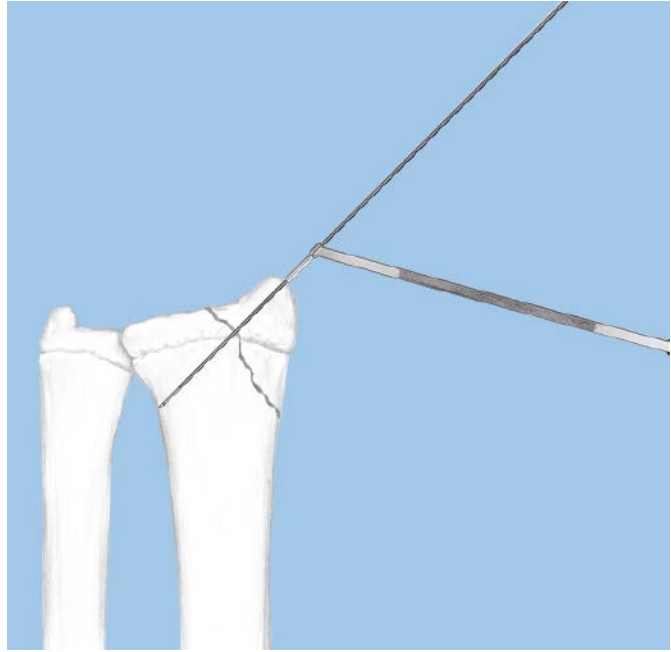
Instrument

292.622 or 1.1 mm Guide Wire
292.623 (threaded or non-threaded)

310.221 2.0 mm Cannulated Drill Bit

312.151 2.0 mm/1.1 mm Double Drill Sleeve

- Insert a 1.1 mm guide wire through the 2.0 mm/1.1 mm double drill sleeve to the appropriate depth under image intensification. Remove the drill sleeve.



2

Countersink

Instrument

310.804 Cannulated Countersink

In areas where soft tissue coverage is minimal, use the cannulated countersink to create a recess for the screw head. Countersinking also facilitates screw insertion when predrilling is not performed.

Note: If the countersink fails to bite, the near cortex can be predrilled using the cannulated drill bit.



3

Measure

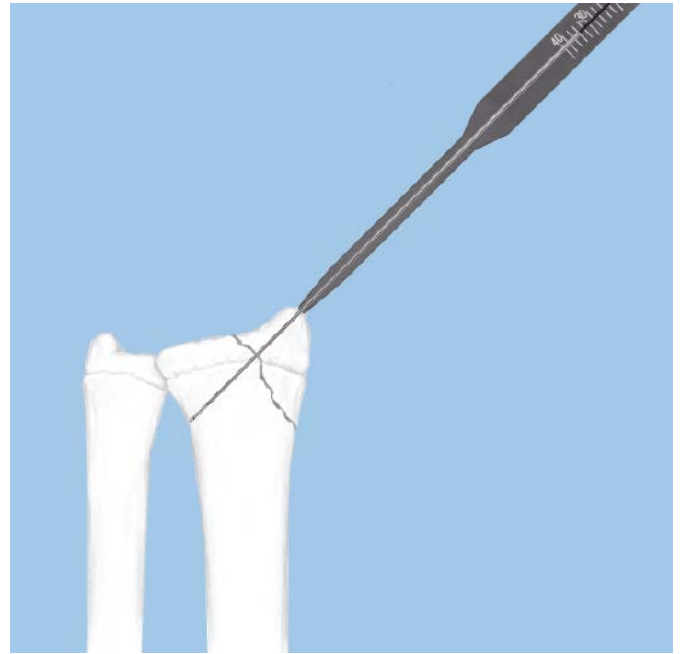
Instrument

319.702 Cannulated Screw Measuring Device

Slide the tapered end of the cannulated screw measuring device over the guide wire, down to the bone. Read the scale at the end of the wire to determine insertion depth.

Notes:

- Only use the guide wire in its original length to ensure correct measurement.
- The reading indicates the appropriate screw length to place the screw at the tip of the guide wire. Subtract appropriately for any anticipated interfragment compression resulting from screw insertion.



4

Insert the screw

Instrument

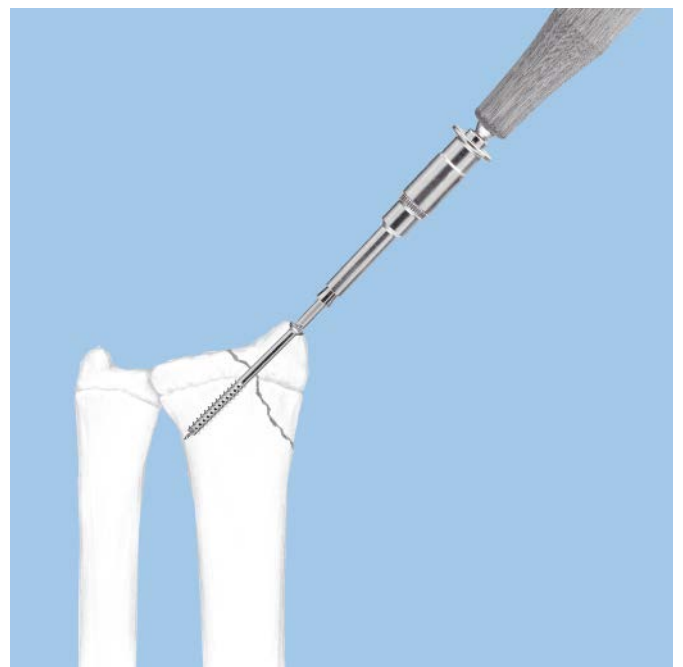
313.969 Holding Sleeve (for 314.463)

314.463 Cannulated Cruciform Screwdriver

Use the cannulated cruciform screwdriver and holding sleeve to insert the screw. Once the screw is seated, remove and discard the guide wire.

Notes:

- In fracture fixation of dense bone, drill the near cortex only. In arthrodeses, drill completely through the near bone and the near cortex of the far bone. Use the 2.0 mm cannulated drill bit.
- In osteoporotic bone, a 6.5 mm washer may be used. Avoid removal and reinsertion of the screw in the same hole. The self-drilling feature of the screw can damage bone threads during reinsertion.



Implant Removal

Instrument

314.465	Solid Cruciform Screwdriver Shaft
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311.43	Handle, with quick coupling
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Expose the screw head and remove the screws using the special screwdriver for the removal of cannulated screws.

Precaution: Do not use the cannulated screwdriver for implant removal.

Implants

3.0 mm Cannulated Screw, short thread

- 8 mm–30 mm lengths in 1 mm increments
- 32 mm–40 mm lengths in 2 mm increments
- Thread length = 1/3 screw length
- Implant-quality 316L stainless steel
- Titanium alloy Ti-6Al-7Nb



3.0 mm Cannulated Screw, long thread

- 14 mm–30 mm lengths in 1 mm increments
- 32 mm–40 mm lengths in 2 mm increments
- Long thread (thread length = 1/2 screw length)
- Implant-quality 316L stainless steel
- Titanium alloy Ti-6Al-7Nb



Threaded Washer, 5.5 mm

- Provides a buttress for a buried screw head
- Implant-quality 316L stainless steel
- Commercially pure (CP) titanium



Washer, 6.5 mm

- Prevents screw head from sinking into osteoporotic bone
- Implant-quality 316L stainless steel
- Commercially pure (CP) titanium



Instruments

292.622 1.1 mm Threaded Guide Wire



292.623 1.1 mm Non-Threaded Guide Wire



309.501 Conical Extraction Device



310.221 2.0 mm Cannulated Drill Bit



310.804 Cannulated Countersink



311.43 Handle, with quick coupling



312.151 2.0 mm/1.1 mm Double Drill Sleeve



312.153 5.5 mm/4.3 mm Double Drill Sleeve



313.969 Holding Sleeve



314.463 Cannulated Cruciform Screwdriver



314.464 Cannulated Driver, for Threaded Washers



314.465 Solid Cruciform Screwdriver Shaft



319.291 1.25 mm Cleaning Brush



319.292 1.1 mm Cleaning Stylet



319.702 Cannulated Screw Measuring Device



319.97 Screw Forceps



398.408 Freer Elevator



398.409 Scaphoid Elevator, 140 mm



3.0 mm Cannulated Screw Instrument and Implant Sets

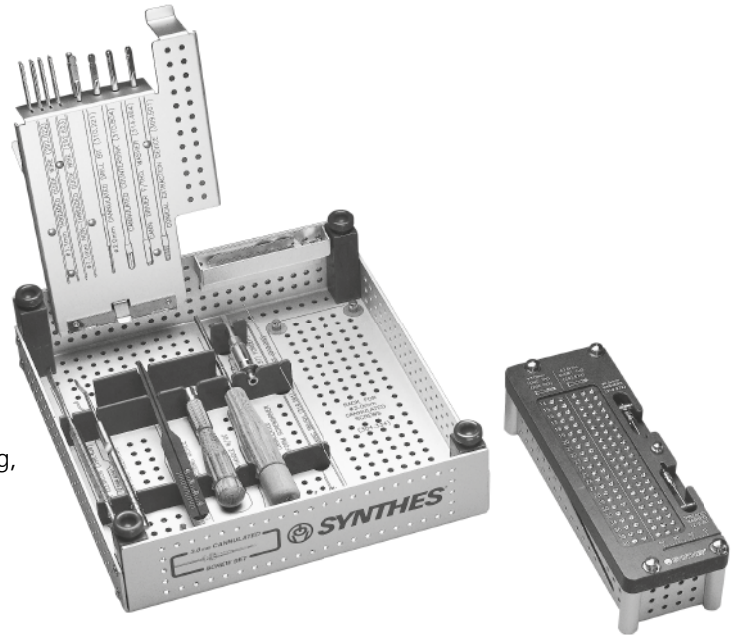
Stainless Steel (105.17) and Titanium (145.17)

Graphic Case

- 304.330 3.0 mm Cannulated Screw Instrument and Implant Set Graphic Case, Stainless Steel
- 304.490 3.0 mm Titanium Cannulated Screw Instrument and Implant Set Graphic Case

Instruments (in both sets)

- 292.622 1.1 mm Threaded Guide Wire, 150 mm, 10 ea.
- 292.623 1.1 mm Non-Threaded Guide Wire, 150 mm, 10 ea.
- 309.501 Conical Extraction Device, for Threaded Washers
- 310.221 2.0 mm Cannulated Drill Bit, quick coupling, 150 mm, 2 ea.
- 310.804 Cannulated Countersink, for 3.0 mm Cannulated Screws
- 311.43 Handle, with quick coupling
- 312.151 2.0 mm/1.1 mm Double Drill Sleeve
- 312.153 5.5 mm/4.3 mm Double Drill Sleeve
- 313.969 Holding Sleeve (for 314.463)
- 314.463 Cannulated Cruciform Screwdriver, for 3.0 mm Cannulated Screws
- 314.464 Cannulated Driver, for Threaded Washers
- 314.465 Cruciform Screwdriver Shaft
- 319.291 1.25 mm Cleaning Brush
- 319.292 1.1 mm Cleaning Stylet
- 319.702 Cannulated Screw Measuring Device
- 319.97 Screw Forceps
- 398.408 Freer Elevator, 195 mm
- 398.409 Scaphoid Elevator, 140 mm



Note: For additional information, please refer to package insert.

For detailed cleaning and sterilization instructions, please refer to www.synthes.com/cleaning-sterilization or sterilization instructions, if provided.

3.0 mm Cannulated Screw Instrument and Implant Sets

Stainless Steel (105.17) and Titanium (145.17) *continued*

Implants

3.0 mm Cannulated Screws, short thread, 3 ea.

Stainless

Steel	Titanium	Length (mm)
202.608	402.608	8 mm
202.609	402.609	9 mm
202.610	402.610	10 mm
202.611	402.611	11 mm
202.612	402.612	12 mm
202.613	402.613	13 mm
202.614	402.614	14 mm
202.615	402.615	15 mm
202.616	402.616	16 mm
202.617	402.617	17 mm
202.618	402.618	18 mm
202.619	402.619	19 mm
202.620	402.620	20 mm
202.621	402.621	21 mm
202.622	402.622	22 mm
202.623	402.623	23 mm
202.624	402.624	24 mm
202.625	402.625	25 mm
202.626	402.626	26 mm
202.627	402.627	27 mm
202.628	402.628	28 mm
202.629	402.629	29 mm
202.630	402.630	30 mm
202.632	402.632	32 mm
202.634	402.634	34 mm
202.636	402.636	36 mm
202.638	402.638	38 mm
202.640	402.640	40 mm

3.0 mm Cannulated Screws, long thread, 2 ea.

Stainless

Steel	Titanium	Length (mm)
202.714	402.714	14 mm
202.715	402.715	15 mm
202.716	402.716	16 mm
202.717	402.717	17 mm
202.718	402.718	18 mm
202.719	402.719	19 mm
202.720	402.720	20 mm
202.721	402.721	21 mm
202.722	402.722	22 mm
202.723	402.723	23 mm

3.0 mm Cannulated Screws, long thread, 2 ea. *continued*

Stainless

Steel	Titanium	Length (mm)
202.724	402.724	24 mm
202.725	402.725	25 mm
202.726	402.726	26 mm
202.727	402.727	27 mm
202.728	402.728	28 mm
202.729	402.729	29 mm
202.730	402.730	30 mm
202.732	402.732	32 mm
202.734	402.734	34 mm
202.736	402.736	36 mm
202.738	402.738	38 mm
202.740	402.740	40 mm

Washers

Stainless

Steel	Titanium	Description
219.89	419.89	Threaded Washer, for 3.0 mm Cannulated Screws, 5 ea.
219.972	419.972	Washer, 6.5 mm, for 3.0 mm Cannulated Screws, 6 ea.

Also Available

105.954	Small Battery Drive with 14.4V Battery Pack Set
304.334	3.0 mm Cannulated Screw Set Graphic Case Screw Rack
304.494	3.0 mm Titanium Cannulated Screw Set Graphic Case Screw Rack
314.461	Cannulated Cruciform Screwdriver with Holding Sleeve (consists of 314.463 and 313.969)

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