

Part of the DePuy Synthes Cannulated Screw System

4.5 mm Cannulated Screws

Surgical Technique

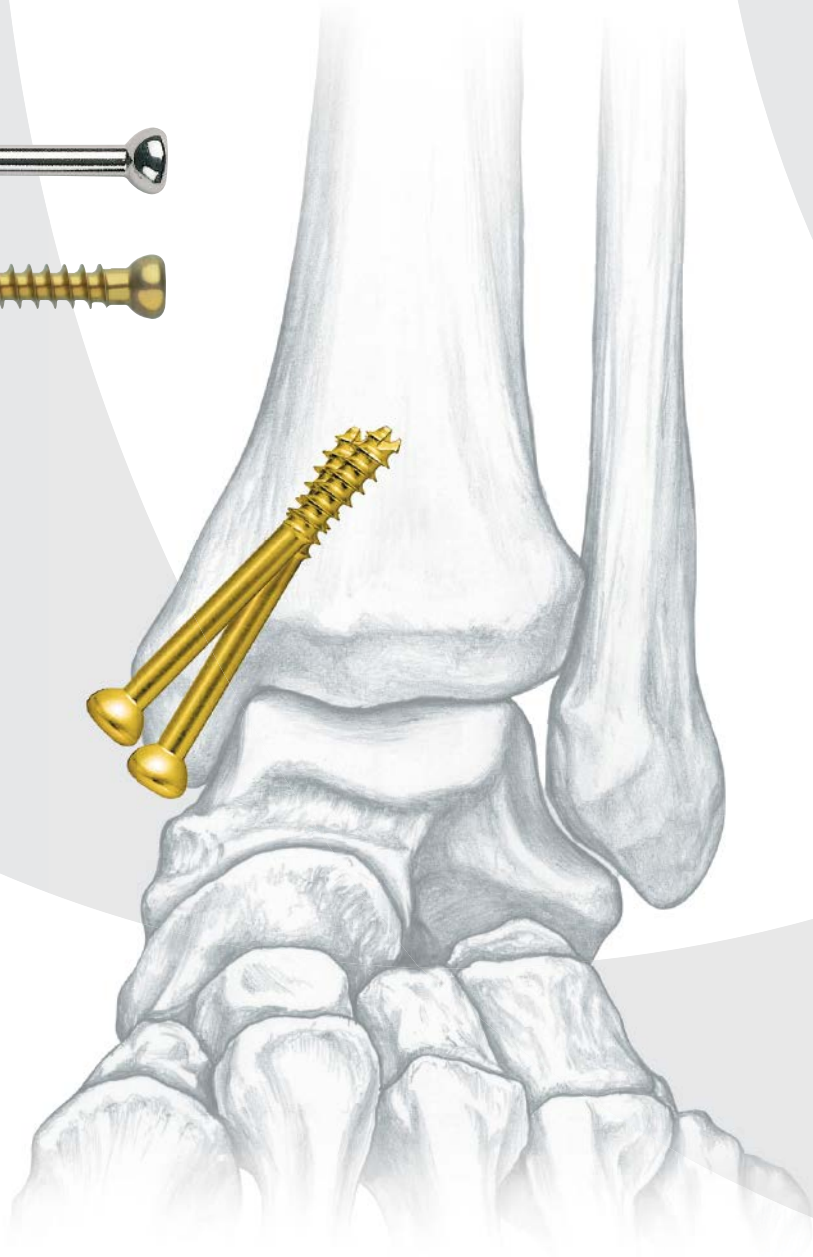


Table of Contents

Introduction	4.5 mm Cannulated Screws	2
	AO Principles	3
	Indications	4
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Surgical Technique	Surgical Technique Information	5
	Percutaneous Insertion of Screws	6
	Implant Removal	10
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Product Information	Implants	11
	Instruments	12
	Set Lists	15

MR Information

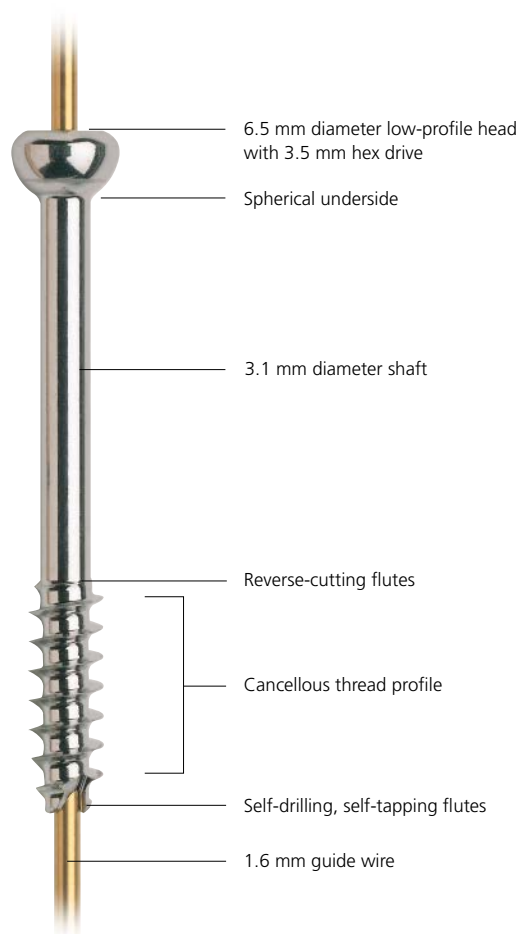
The 4.5 mm Cannulated Screw System has not been evaluated for safety and compatibility in the MR environment. It has not been tested for heating, migration or image artifact in the MR environment. The safety of the 4.5 mm Cannulated Screw System in the MR environment is unknown. Scanning a patient who has this device may result in patient injury.

 Image intensifier control

4.5 mm Cannulated Screws

Features

- Cannulated shaft accepts 1.6 mm diameter guide wires (threaded and nonthreaded wires available)
- Hemispherical head ensures optimal annular contact with washers and DePuy Synthes Companies plates when screws are angled
- Standard 3.5 mm hexagonal drive is compatible with screwdrivers in other commonly used DePuy Synthes Sets
- Reverse-cutting flutes assist in screw removal
- 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

- Partially threaded (thread length = 1/3 screw length)
- Fully threaded



Materials

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

AO Principles

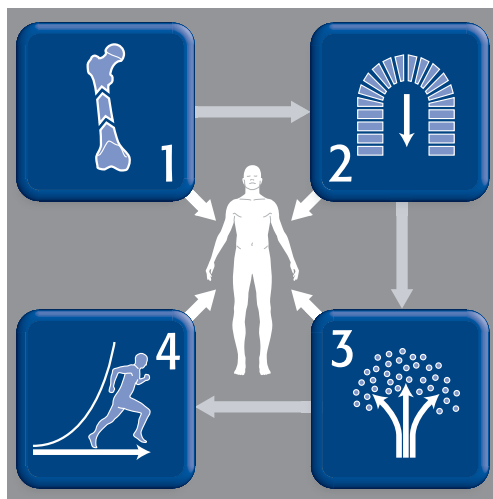
In 1958, the AO formulated four basic principles, which have become the guidelines for internal fixation.^{1,2}

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 DePuy Synthes 4.5mm Cannulated Screws are intended for fixation of fractures, fusions, osteotomies, nonunions, and malunions of long bones and long bone fragments; and the bones of the hand and foot, in adults and in both children (2-12 years) and adolescents (12-21 years) in which growth plates have fused or in which growth plates will not be crossed by screw fixation.

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



Surgical Technique Information

Cleaning cannulations

Instruments

319.26	1.75 mm Cleaning Brush
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319.35	1.6 mm Cleaning Stylet
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Note: Cleaning the cannulation in each instrument is imperative for proper function.

Instruments should be cleared intraoperatively with the 1.6 mm cleaning stylet to prevent accumulation of debris in the cannulation and potential binding of the instruments about the guide wire. Instruments should be cleaned postoperatively with both the stylet and the 1.75 mm cleaning brush.

Drilling and tapping

The self-drilling, self-tapping flutes of the 4.5 mm cannulated screws make predrilling and pretapping unnecessary in most cases. The sets include 3.2 mm cannulated drill bits and a cannulated tap for use in dense bone, if needed.

Percutaneous Insertion of Screws

1. Insert guide wire

Instruments

292.72	1.6 mm Threaded Guide Wire
312.74	1.6 mm Trocar
312.75	3.2 mm/1.6 mm Drill Sleeve
312.76	7.0 mm/3.2 mm Drill Sleeve
312.77	9.5 mm/7.0 mm Protection Sleeve

- Insert the percutaneous sleeve assembly (protection sleeve, drill sleeves, and trocar) through a stab incision and soft tissue to the bone. Remove the trocar and insert a 1.6 mm threaded guide wire through the innermost drill sleeve to the appropriate depth, under image intensification.

Optional technique: Insert additional guide wire(s)

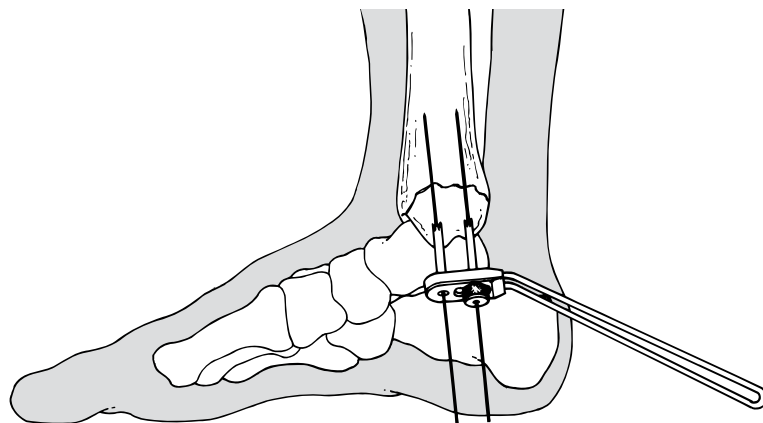
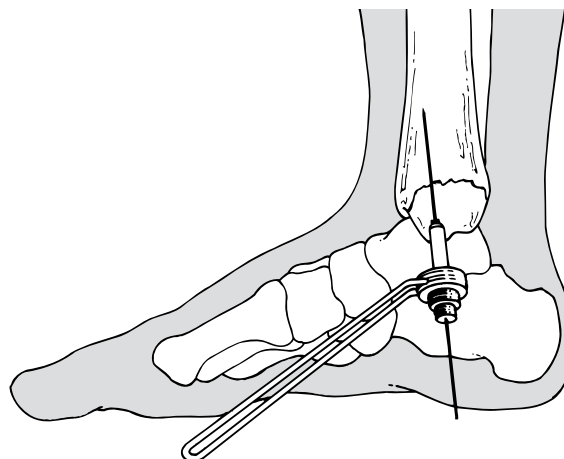
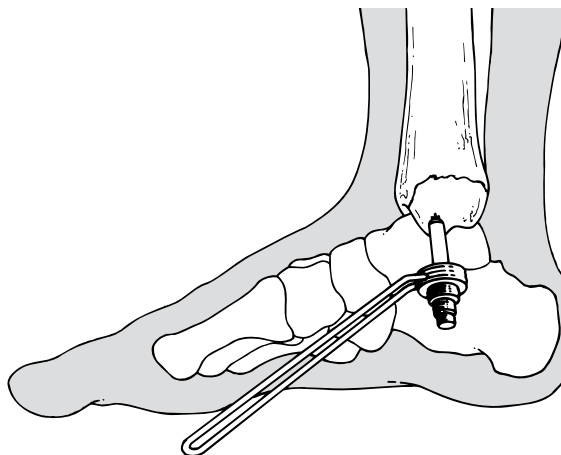
Instrument

312.73	Adjustable Parallel Wire Guide
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Use the adjustable parallel wire guide to place parallel wires at various distances from the first wire.

Place the fixed sleeve over the previously inserted wire and adjust the movable sleeve to the desired position and distance. Tighten the knurled nut on the adjustable sleeve to lock it in place and insert wire. Repeat for desired number of additional wires.

Note: The placement of three guide wires is recommended to achieve adequate rotational stability.



2. Countersink (optional)

Instrument

310.85	Cannulated Countersink
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Where soft tissue coverage is minimal, use the cannulated countersink to create a recess for the screw head. Countersinking will also facilitate screw insertion.

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

3. Measure for screw length

Instruments

292.72	1.6 mm Threaded Guide Wire
319.17	Cannulated Screw Measuring Device

Remove the two inner drill sleeves. Slide the tapered end of the cannulated screw measuring device over the guide wire through the protection sleeve and to the bone. Read the scale at the end of the guide wire to determine appropriate screw length. This reading will place the screw 5 mm short of the guide wire tip, allowing the threaded portion of the guide wire to remain in the bone during screw insertion.

Notes:

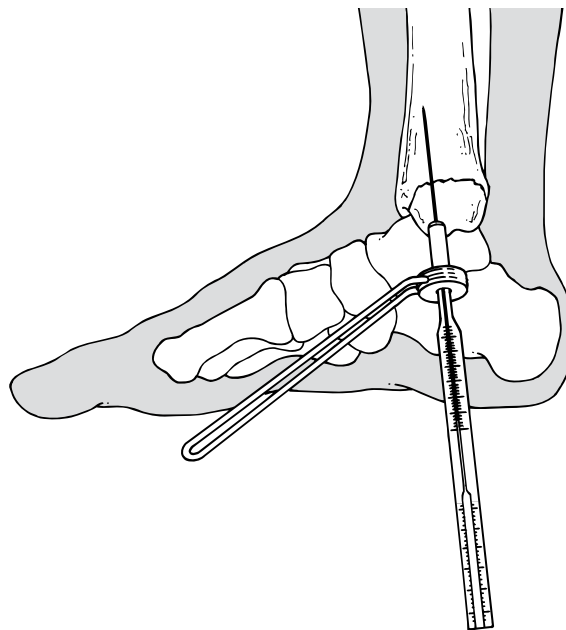
- **Only use the guide wire in its original length to ensure correct measurement.**
- **If the reading indicates 42 mm, use a 42 mm screw to place the screw 5 mm short of the wire tip.**

Optional technique: Drill and tap

Instruments

310.65	3.2 mm Cannulated Drill Bit
311.59	Cannulated Tap
312.76	7.0 mm/3.2 mm Drill Sleeve
312.77	9.5 mm/7.0 mm Protection Sleeve

To predrill and tap in dense bone, place the 7.0 mm/3.2 mm drill sleeve into the protection sleeve and drill through the near cortex with the 3.2 mm cannulated drill bit. Remove the 7.0 mm/3.2 mm drill sleeve. Use the cannulated tap through the protection sleeve.



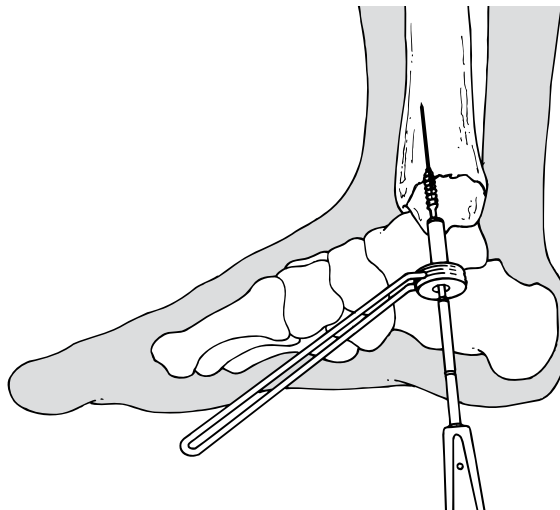
4. Insert screw

Instruments

292.72	1.6 mm Threaded Guide Wire
314.20	Cannulated Hexagonal Screwdriver
314.31	Holding Sleeve
314.80*	Cannulated Hexagonal Screwdriver Shaft

Place the appropriate length screw over the guide wire. Use the cannulated hexagonal screwdriver, or cannulated hexagonal screwdriver shaft, and holding sleeve to insert the screw. Remove and discard the guide wire.

Note: In osteoporotic bone, a washer may be necessary to prevent the screw head from sinking into the bone.



*Also available.

Implant Removal

Instruments

314.15	Large Hexagonal Screwdriver Shaft, 3.5 mm width across flats
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311.44	T-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

4.5 mm Cannulated Screws, partially threaded

- 20 mm–56 mm lengths in 2 mm increments
- 60 mm–80 mm lengths in 4 mm increments
- Thread length = 1/3 screw length
- 316L stainless steel and titanium alloy (Ti-6Al-7Nb)



4.5 mm Cannulated Screws, fully threaded*

- 20 mm–56 mm lengths in 2 mm increments
- 60 mm–80 mm lengths in 4 mm increments
- 316L stainless steel and titanium alloy (Ti-6Al-7Nb)



Washer, 10.0 mm

- To prevent screw head from sinking into osteoporotic bone
- 316L stainless steel and commercially pure (CP) titanium



*Also available.

Instruments

292.72 1.6 mm Threaded Guide Wire, 150 mm



292.727* 1.6 mm Nonthreaded Guide Wire, 150 mm



310.16 1.5 mm Drill Bit, quick coupling, 110 mm



310.65 3.2 mm Cannulated Drill Bit, quick coupling, 170 mm, 1.7 mm cannulation



310.66* 4.5 mm Cannulated Drill Bit, quick coupling, 170 mm, 1.7 mm cannulation



310.85 Cannulated Countersink, quick coupling



311.44 T-Handle, with quick coupling



311.59 Cannulated Tap for 4.5 mm Cannulated Screws, 180 mm



*Also available.

312.46 4.5 mm/3.2 mm Double Drill Sleeve



312.73 Adjustable Parallel Wire Guide



312.74 1.6 mm Trocar, 59 mm length



312.75 3.2 mm/1.6 mm Drill Sleeve



312.76 7.0 mm/3.2 mm Drill Sleeve



312.77 9.5 mm/7.0 mm Protection Sleeve



314.15 Large Hexagonal Screwdriver Shaft,
3.5 mm width across flats



Instruments

314.20 Cannulated Hexagonal Screwdriver,
1.7 mm cannulation, 3.5 mm width
across flats



314.31 Holding Sleeve



314.80* Cannulated Hexagonal Screwdriver
Shaft, 1.8 mm cannulation, 3.5 mm
width across flats



319.17 Cannulated Screw Measuring Device



319.26 1.75 mm Cleaning Brush



319.35 1.6 mm Cleaning Stylet



319.97 Screw Forceps



*Also available.

4.5 mm Cannulated Screw Instrument and Implant Sets

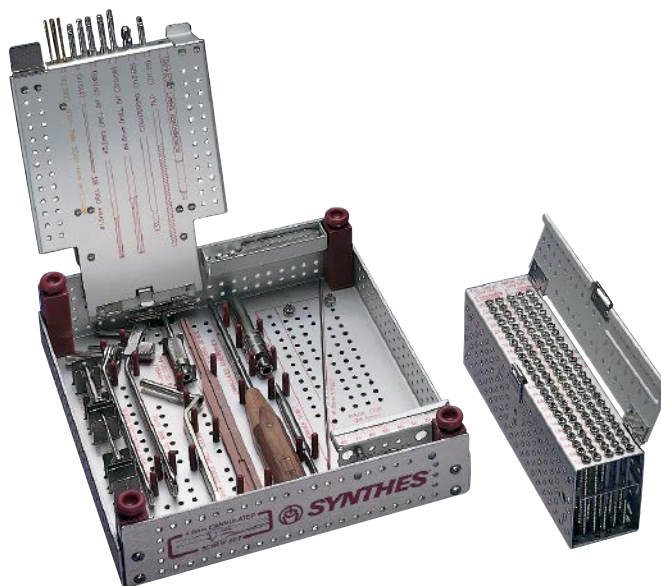
Stainless Steel (105.04) and Titanium (145.04)

Graphic Case

- 304.220 4.5 mm Cannulated Screw Instrument and Implant Set Graphic Case
- 304.420 4.5 mm Titanium Cannulated Screw Instrument and Implant Set Graphic Case

Instruments

- 292.72 1.6 mm Threaded Guide Wire, 150 mm, 10 ea.
- 310.16 1.5 mm Drill Bit, quick coupling, 110 mm
- 310.65 3.2 mm Cannulated Drill Bit, quick coupling, 170 mm, 2 ea.
- 310.85 Cannulated Countersink
- 311.44 T-Handle, with quick coupling
- 311.59 Cannulated Tap for 4.5 mm Cannulated Screws
- 312.46 4.5 mm/3.2 mm Double Drill Sleeve
- 312.73 Adjustable Parallel Wire Guide
- 312.74 1.6 mm Trocar, 59 mm length
- 312.75 3.2 mm/1.6 mm Drill Sleeve
- 312.76 7.0 mm/3.2 mm Drill Sleeve
- 312.77 9.5 mm/7.0 mm Protection Sleeve
- 314.15 Large Hexagonal Screwdriver Shaft
- 314.20 Cannulated Hexagonal Screwdriver
- 314.31 Holding Sleeve
- 319.17 Cannulated Screw Measuring Device, for 4.5 mm Cannulated Screws
- 319.26 1.75 mm Cleaning Brush
- 319.35 1.6 mm Cleaning Stylet
- 319.97 Screw Forceps



Note: For additional information, please refer to the package insert or www.e-ifu.com.

For detailed cleaning and sterilization instructions, please refer to www.depuySynthes.com/hcp/cleaning-sterilization or sterilization instructions, if provided in the instructions for use.

4.5 mm Cannulated Screw Instrument and Implant Sets
Stainless Steel (105.04) and Titanium (145.04)

Implants

4.5 mm Cannulated Screws, partially threaded, 3 ea.
(thread length=1/3 screw length)

Stainless

Steel	Titanium	Length (mm)
214.520	414.520	20
214.522	414.522	22
214.524	414.524	24
214.526	414.526	26
214.528	414.528	28
214.530	414.530	30
214.532	414.532	32
214.534	414.534	34
214.536	414.536	36
214.538	414.538	38
214.540	414.540	40
214.542	414.542	42
214.544	414.544	44
214.546	414.546	46
214.548	414.548	48
214.550	414.550	50
214.552	414.552	52
214.554	414.554	54
214.556	414.556	56
214.560	414.560	60
214.564	414.564	64
214.568	414.568	68
214.572	414.572	72

219.91	419.91	Washer, 10.0 mm, 5 ea.
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4.5 mm Cannulated Screw Instrument and Implant Sets
Stainless Steel (105.04) and Titanium (145.04)

Also Available

4.5 mm Cannulated Screws, partially threaded			292.727	1.6 mm Nonthreaded Guide Wire, 150 mm
Stainless Steel			304.223	4.5 mm Cannulated Screw Instrument and Implant Set Graphic Case Screw Rack
	Titanium	Length (mm)		4.5 mm Titanium Cannulated Screw Instrument and Implant Set Graphic Case Screw Rack
214.576	414.576	76	304.423	
214.580	414.580	80		
4.5 mm Cannulated Screws, fully threaded			310.66	4.5 mm Cannulated Drill Bit, quick coupling, 170 mm, 1.7 mm cannulation
Stainless Steel			314.80	Cannulated Hexagonal Screwdriver shaft, 3.5 mm width across flats
	Titanium	Length (mm)		
214.720	414.720	20		
214.722	414.722	22	105.954	Small Battery Drive Set with 14.4 V battery pack
214.724	414.724	24		
214.726	414.726	26	105.957	Power Drive Set
214.728	414.728	28		
214.730	414.730	30		
214.732	414.732	32		
214.734	414.734	34		
214.736	414.736	36		
214.738	414.738	38		
214.740	414.740	40		
214.742	414.742	42		
214.744	414.744	44		
214.746	414.746	46		
214.748	414.748	48		
214.750	414.750	50		
214.752	414.752	52		
214.754	414.754	54		
214.756	414.756	56		
214.760	414.760	60		
214.764	414.764	64		
214.768	414.768	68		
214.772	414.772	72		
214.776	414.776	76		
214.777	414.777	80		

Limited Warranty and Disclaimer: DePuy Synthes products are sold with a limited warranty to the original purchaser against defects in workmanship and materials. Any other express or implied warranties, including warranties of merchantability or fitness, are hereby disclaimed.

Please also refer to the package insert(s) or other labeling associated with the devices identified in this surgical technique for additional information.

CAUTION: Federal Law restricts these devices to sale by or on the order of a physician.

Some devices listed in this technique guide may not have been licensed in accordance with Canadian law and may not be for sale in Canada.

Please contact your sales consultant for items approved for sale in Canada.

Not all products may currently be available in all markets.



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