

FLEXIBLE MONOBLOC REAMERS

Advanced Nailing System

Surgical Technique

To Facilitate the Insertion of IM Nails






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The AO Principles of Fracture Management

Mission

The AO's mission is promoting excellence in patient care and outcomes in trauma and musculoskeletal disorders.

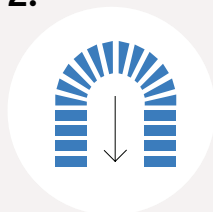
AO Principles^{1,2}

1.



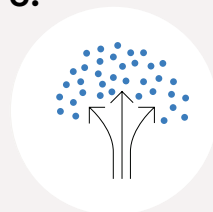
Fracture reduction and fixation to restore anatomical relationships.

2.



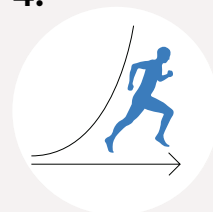
Fracture fixation providing absolute or relative stability, as required by the “personality” of the fracture, the patient, and the injury.

3.



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

4.



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

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

Flexible Monobloc Reamers for Intramedullary Nails

Intended Use

The Monobloc Intramedullary Flexible Reamers are intended to ream an intramedullary bone canal in preparation for insertion of implants (e.g. intramedullary nails or stems).

Monobloc Flexible Reaming System

- One-piece
- \varnothing 8 mm to 18 mm hybrid head design which incorporates both front and side cutting features
- Available in **480 mm** and **620 mm** lengths
- Couples with **Modified Trinkle (Hudson)** connection drill couplings or **Jacobs Chuck** drill couplings



\varnothing 3.0 mm Reaming Rod

Available in **950 mm** and **1150 mm** lengths

- \varnothing 3.0 mm shaft diameter
- \varnothing 3.8 mm ball tip
- 03.233.010S and 03.233.011S



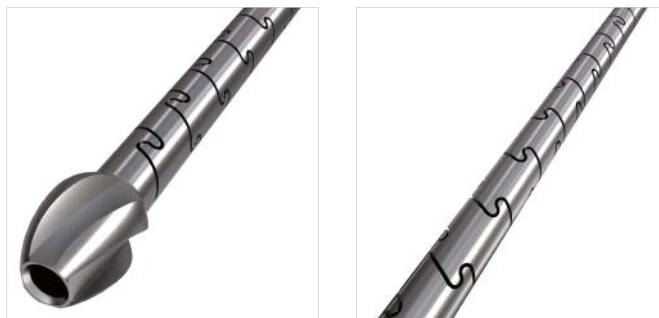
■ Note:

Only use \varnothing 3.0 mm reaming rods with ball tips with 480 mm and 620 mm monobloc reamer (03.233.010S and 03.233.011S).

Additional Reamers

Monobloc Flexible Reamers- Small

- From sizes \varnothing 6 mm-10.5 mm in 0.5 mm increments
- **385 mm** length
- Flexible laser pattern, one piece, front-cutting reamers
- Couples with Modified Trinkle drill couplings or Jacobs Chuck drill couplings
- Requires use of \varnothing 2.5 mm Reaming Rod



\varnothing 2.5 mm Reaming Rods for use with Monobloc Flexible Reamers- Small

- Available sterile in 650 mm, 950 mm, and 1150 mm
- 351.709S, 351.706S, 351.708S

■ Note:

\varnothing 2.5 mm rods **ONLY** for 385 mm monobloc reamers.

\varnothing 6.0 mm and \varnothing 7.0 mm Hand Reamers

- For use in medullary canals with an isthmus smaller than \varnothing 7.0 mm
- Use hand reamers incrementally to widen the medullary canal to \varnothing 7.0 mm, before using monobloc reamers under power
- In sclerotic medullary canals, the hand reamers may be used before insertion of the reaming rod
- 450 mm length



Additional Instruments

Hand Instrument Tray in Outlier Trays:

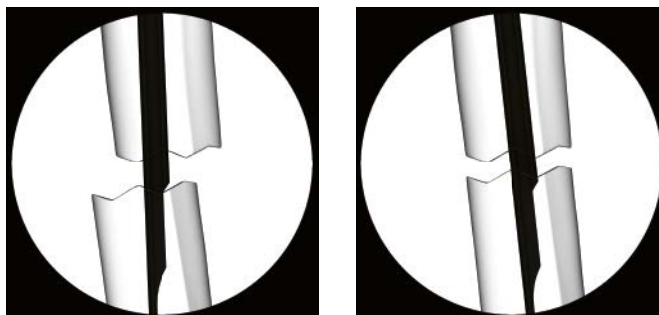
Universal Chuck (03.043.001)



Reaming Rod Pusher (03.010.093)



IM Reduction Tool/Curved with Quick Coupling (03.010.495)



T-Handle/Cannulated with Quick Coupling (03.010.496)



Good Reaming Practices

■ Notes:

- Inspect the reamer heads for damages.
- For technical reasons (cutting geometry), the reamer heads cannot be resharpened. Damaged reamers have to be replaced.

▲ Precaution:

Never ream without using a reaming rod.

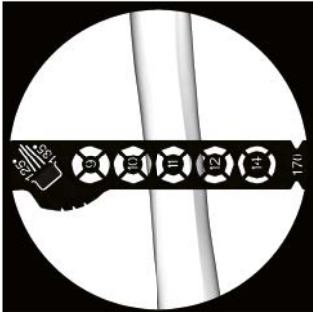
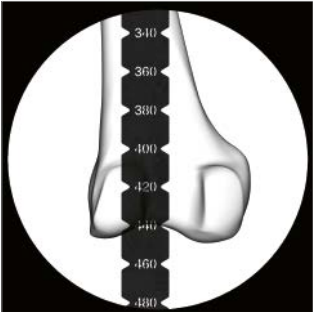
Good Reaming Practices

- Inspect reamer heads for dullness before every surgery that requires reaming
- Ream with a ball tipped reaming rod
- Widen canals narrower than 7.0 mm with the hand reamers
- Starting reamer size should be a maximum of 0.5 mm larger than the canal isthmus
- Ream in 0.5 mm increments; do not skip reamer head sizes

Reduction and Nail Sizing

Note:

Follow guidance from respective nail related surgical technique guides to reduce fractures and confirm appropriate nail size.



Reaming

Ream Medullary Canal

Instruments

Hand Reamers			
351.92	6.0 mm Hand Reamer		
351.93	7.0 mm Hand Reamer		
Hand Instruments			
03.043.001	Universal Chuck		
03.010.093	Reaming Rod Pusher		
3.0 mm Reaming Rods			
03.233.010S	950 mm Reaming Rod w/3.8 mm Ball Tip		
03.233.011S	1150 mm Reaming Rod w/3.8 mm Ball Tip		
Monobloc Flexible Reamers (480 mm length)			
03.045.080 – 03.045.180 8 mm to 18 mm Reamers			
Monobloc Flexible Reamers (620 mm length)			
03.045.280 – 03.045.380 8 mm to 18 mm Reamers			
2.5 mm Reaming Rods			
351.709S	650 mm Reaming Rod		
351.706S	950 mm Reaming Rod		
351.708S	1150 mm Reaming Rod		
Monobloc Flexible Reamers (385 mm length)			
03.028.060	6.0 mm	03.028.085	8.5 mm
03.028.065	6.5 mm	03.028.090	9.0 mm
03.028.070	7.0 mm	03.028.095	9.5 mm
03.028.075	7.5 mm	03.028.100	10.0 mm
03.028.080	8.0 mm	03.028.105	10.5 mm



In medullary canals with an isthmus narrower than 7.0 mm, or in sclerotic medullary canals, use the hand reamer(s) to widen the canal before using the power-driven reamers.

■ **Note:**

Starting reamer size should be maximum of 0.5 mm larger than the canal isthmus.

▲ **Precaution:**

Monobloc Flexible Reamers must be used with drill power configurations only. DO NOT use reaming power configurations as it will cause reamer breakage in the event that the reamer is incarcerated.

Do not rotate the reamer head when inserting it into the medullary canal. Use the highest speed and slight but uniform force to advance the reamer head in the medullary canal. Move the reaming shaft back and forth to remove bone chips and prevent jamming.

After reaming, withdraw the reamer until the entire reamer head is visible. To prevent a loss of reduction, grasp the reaming rod at the canal entry point and hold the rod in place.

If a reamer jams while reaming, disconnect from power. Use the Universal Chuck to grasp the reaming rod and use light hammer blows on the underside of the Universal Chuck to withdraw the jammed reamer head from the medullary canal. As an alternative, release the reamer by rotating the shaft in reverse.

■ **Notes:**

- Reaming should be performed in 0.5 mm increments. Leave the reaming rod in position for insertion of the cannulated nail.
- With 480/620 mm monobloc reamers, ONLY USE 3.0 mm Reaming Rods w/3.8 mm ball tips (03.233.010S and 03.233.011S)



Cleaning

■ Notes:

- The Monobloc Flexible Reamers follow different cleaning guidelines than the standard DePuy Synthes cleaning guidelines.
- For cleaning instructions for Monobloc Flexible Reamers part numbers 03.028.060–03.028.105, refer to www.avalign.com/ifu packaging insert #RD_IFU_0001.
- For cleaning instructions for Monobloc Flexible Reamers part numbers 03.045.080-03.045.380, refer to www.avalign.com/ifu packaging insert #RD_IFU-16001C-01.
- The Monobloc Flexible Reamers and associated cases/trays follow different cleaning guidelines than standard DePuy Synthes cleaning guidelines. For cleaning instructions refer to www.avalign.com/ifu packaging insert #RD_IFU-16001C-01.

Inspecting Reamers

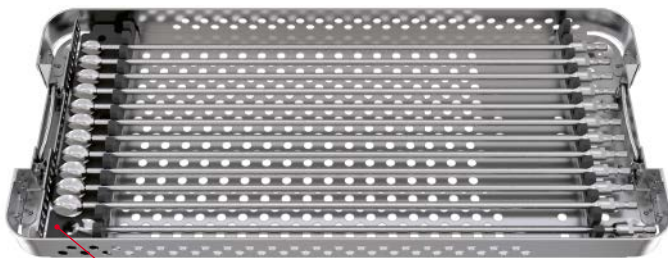
Wear Indicator

Wear indicators for each reamer size are adjacent to the reamer in the graphic case. Attempt to pass the reamer head through the appropriate wear indicator hole to check for wear. If the respective reamer head passes through the wear indicator hole, the reamer is at least $\sim \varnothing 0.25$ mm smaller than intended and should be replaced.

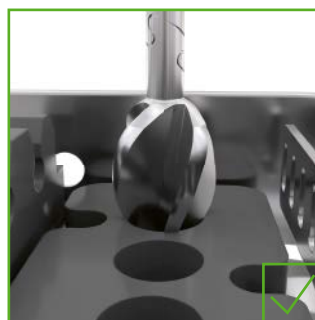
■ Note:

This gauge is strictly for sizing purposes and does not indicate if the reamers are unsafe to use because they are undersized.

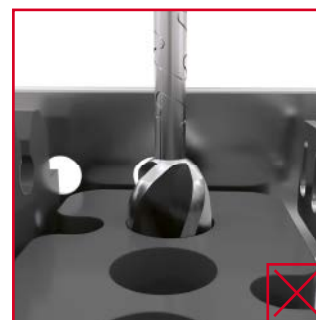
Reamer trays include built in wear indicators



Wear indicator holes



Hole interfering with reamer head means it has not worn less than $\varnothing 0.25$ mm of initial diameter



Reamer head passing through hole means it has worn at least $\varnothing 0.25$ mm of initial diameter.

Instruments

03.010.496 T-Handle/Cannulated with Quick Coupling



03.010.495 IM Reduction Tool/Curved with Quick Coupling



351.92 6.0 mm Hand Reamer
351.93 7.0 mm Hand Reamer



03.043.001 Universal Chuck



03.010.093 Reaming Rod Pusher



3.0 mm Reaming Rods
03.233.010S 950 mm Reaming Rod w/3.8 mm Ball Tip
03.233.011S 1150 mm Reaming Rod w/3.8 mm Ball Tip



2.5 mm Reaming Rods with ball tip
351.709S 650 mm
351.706S 950 mm
351.708S 1150 mm



Reamer Set Configurations

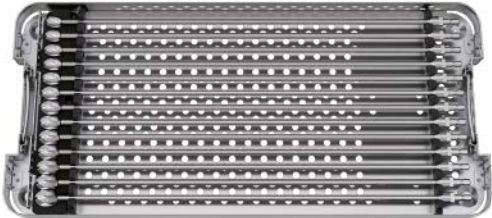
Standard (480 mm) Efficiency Set 01.045.034

Reamers

03.045.080	Monobloc Flexible Reamer 8 mm
03.045.085	Monobloc Flexible Reamer 8.5 mm
03.045.090	Monobloc Flexible Reamer 9 mm
03.045.095	Monobloc Flexible Reamer 9.5 mm
03.045.100	Monobloc Flexible Reamer 10 mm
03.045.105	Monobloc Flexible Reamer 10.5 mm
03.045.110	Monobloc Flexible Reamer 11 mm
03.045.115	Monobloc Flexible Reamer 11.5 mm
03.045.120	Monobloc Flexible Reamer 12 mm
03.045.125	Monobloc Flexible Reamer 12.5 mm
03.045.130	Monobloc Flexible Reamer 13 mm
03.045.135	Monobloc Flexible Reamer 13.5 mm
03.045.140	Monobloc Flexible Reamer 14 mm

Cases/Trays

60.045.050	Monobloc Flexible Reamer Standard Case Base
60.045.051	Monobloc Flexible Reamer Standard Case Lid



Standard (480 mm) Outlier Set 01.045.036

Reamers

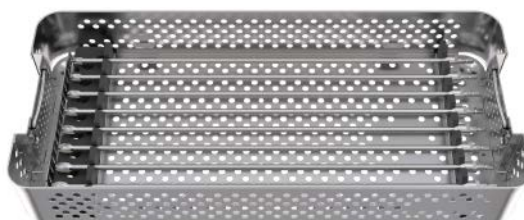
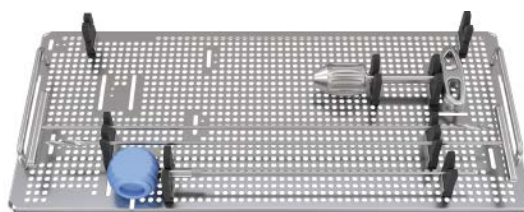
03.045.145	Monobloc Flexible Reamer 14.5 mm
03.045.150	Monobloc Flexible Reamer 15 mm
03.045.155	Monobloc Flexible Reamer 15.5 mm
03.045.160	Monobloc Flexible Reamer 16 mm
03.045.165	Monobloc Flexible Reamer 16.5 mm
03.045.170	Monobloc Flexible Reamer 17 mm
03.045.175	Monobloc Flexible Reamer 17.5 mm
03.045.180	Monobloc Flexible Reamer 18 mm

Hand Instruments

351.92	Ø 6 mm Hand Reamer
351.93	Ø 7 mm Hand Reamer
03.043.001	Universal Chuck
03.010.093	Reaming Rod Pusher

Cases/Trays

60.045.054	Monobloc Flexible Reamer Standard Outlier Base
60.045.051	Monobloc Flexible Reamer Standard Case Lid



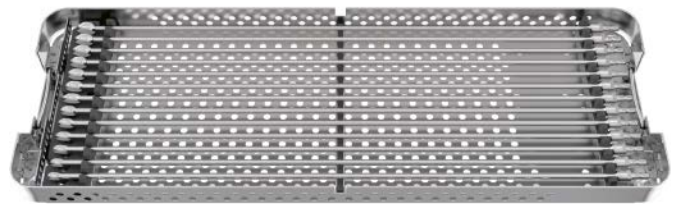
Long (620 mm) Efficiency Set 01.045.035

Reamers

03.045.280	Monobloc Flexible Reamer 8 mm
03.045.285	Monobloc Flexible Reamer 8.5 mm
03.045.290	Monobloc Flexible Reamer 9 mm
03.045.295	Monobloc Flexible Reamer 9.5 mm
03.045.300	Monobloc Flexible Reamer 10 mm
03.045.305	Monobloc Flexible Reamer 10.5 mm
03.045.310	Monobloc Flexible Reamer 11 mm
03.045.315	Monobloc Flexible Reamer 11.5 mm
03.045.320	Monobloc Flexible Reamer 12 mm
03.045.325	Monobloc Flexible Reamer 12.5 mm
03.045.330	Monobloc Flexible Reamer 13 mm
03.045.335	Monobloc Flexible Reamer 13.5 mm
03.045.340	Monobloc Flexible Reamer 14 mm

Cases/Trays

60.045.052	Monobloc Flexible Reamer Long Case Base
60.045.053	Monobloc Flexible Reamer Long Case Lid



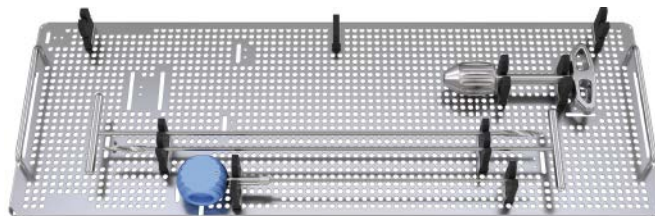
Long (620 mm) Outlier Set 01.045.037

Reamers

03.045.345	Monobloc Flexible Reamer 14.5 mm
03.045.350	Monobloc Flexible Reamer 15 mm
03.045.355	Monobloc Flexible Reamer 15.5 mm
03.045.360	Monobloc Flexible Reamer 16 mm
03.045.365	Monobloc Flexible Reamer 16.5 mm
03.045.370	Monobloc Flexible Reamer 17 mm
03.045.375	Monobloc Flexible Reamer 17.5 mm
03.045.380	Monobloc Flexible Reamer 18 mm

Hand Instruments

351.92	Ø 6 mm Hand Reamer
351.93	Ø 7 mm Hand Reamer
03.043.001	Universal Chuck
03.010.093	Reaming Rod Pusher



Cases/Trays

60.045.055	Monobloc Flexible Reamer Long Outlier Base
60.045.053	Monobloc Flexible Reamer Long Case Lid



Full Standard (480 mm) Set 01.045.038

Reamers

03.045.080	Monobloc Flexible Reamer 8 mm
03.045.085	Monobloc Flexible Reamer 8.5 mm
03.045.090	Monobloc Flexible Reamer 9 mm
03.045.095	Monobloc Flexible Reamer 9.5 mm
03.045.100	Monobloc Flexible Reamer 10 mm
03.045.105	Monobloc Flexible Reamer 10.5 mm
03.045.110	Monobloc Flexible Reamer 11 mm
03.045.115	Monobloc Flexible Reamer 11.5 mm
03.045.120	Monobloc Flexible Reamer 12 mm
03.045.125	Monobloc Flexible Reamer 12.5 mm
03.045.130	Monobloc Flexible Reamer 13 mm
03.045.135	Monobloc Flexible Reamer 13.5 mm
03.045.140	Monobloc Flexible Reamer 14 mm
03.045.145	Monobloc Flexible Reamer 14.5 mm
03.045.150	Monobloc Flexible Reamer 15 mm
03.045.155	Monobloc Flexible Reamer 15.5 mm
03.045.160	Monobloc Flexible Reamer 16 mm
03.045.165	Monobloc Flexible Reamer 16.5 mm
03.045.170	Monobloc Flexible Reamer 17 mm
03.045.175	Monobloc Flexible Reamer 17.5 mm
03.045.180	Monobloc Flexible Reamer 18 mm

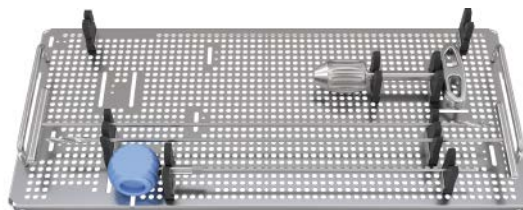
Hand Instruments

351.92 Ø 6 mm Hand Reamer

351.93 Ø 7 mm Hand Reamer

03.043.001 Universal Chuck

03.010.093 Reaming Rod Pusher



Cases/Trays

60.045.050 Monobloc Flexible Reamer Standard
Case Base

60.045.054 Monobloc Flexible Reamer Standard
Outlier Base

60.045.056 Monobloc Flexible Reamer Standard
Outer Case Base

60.045.057 Monobloc Flexible Reamer Standard
Outer Lid



Full Long (620 mm) Set 01.045.039

Reamers

03.045.280	Monobloc Flexible Reamer 8 mm
03.045.285	Monobloc Flexible Reamer 8.5 mm
03.045.290	Monobloc Flexible Reamer 9 mm
03.045.295	Monobloc Flexible Reamer 9.5 mm
03.045.300	Monobloc Flexible Reamer 10 mm
03.045.305	Monobloc Flexible Reamer 10.5 mm
03.045.310	Monobloc Flexible Reamer 11 mm
03.045.315	Monobloc Flexible Reamer 11.5 mm
03.045.320	Monobloc Flexible Reamer 12 mm
03.045.325	Monobloc Flexible Reamer 12.5 mm
03.045.330	Monobloc Flexible Reamer 13 mm
03.045.335	Monobloc Flexible Reamer 13.5 mm
03.045.340	Monobloc Flexible Reamer 14 mm
03.045.345	Monobloc Flexible Reamer 14.5 mm
03.045.350	Monobloc Flexible Reamer 15 mm
03.045.355	Monobloc Flexible Reamer 15.5 mm
03.045.360	Monobloc Flexible Reamer 16 mm
03.045.365	Monobloc Flexible Reamer 16.5 mm
03.045.370	Monobloc Flexible Reamer 17 mm
03.045.375	Monobloc Flexible Reamer 17.5 mm
03.045.380	Monobloc Flexible Reamer 18 mm

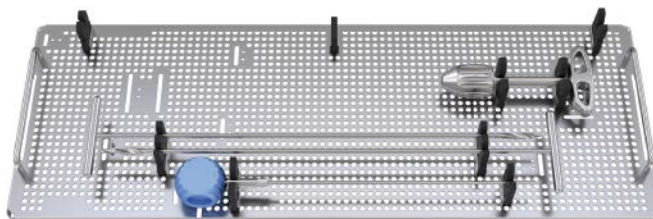
Hand Instruments

351.92 Ø 6 mm Hand Reamer

351.93 Ø 7 mm Hand Reamer

03.043.001 Universal Chuck

03.010.093 Reaming Rod Pusher

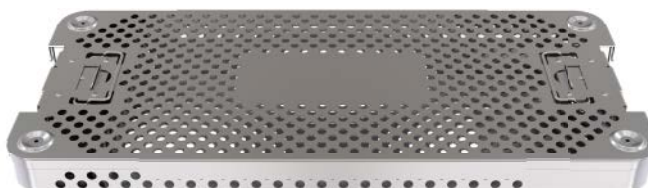
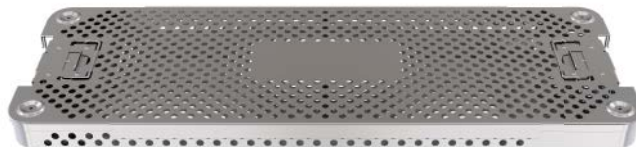


Cases/Trays

60.045.052 Monobloc Flexible Reamer Long Case Base

60.045.053 Monobloc Flexible Reamer Long Case Lid (2)

60.045.055 Monobloc Flexible Reamer Long Outlier Base



Monobloc Flexible Reamers (385 mm) Set 01.028.000

03.028.060	Monobloc Flexible Reamer 6.0 mm
03.028.065	Monobloc Flexible Reamer 6.5 mm
03.028.070	Monobloc Flexible Reamer 7.0 mm
03.028.075	Monobloc Flexible Reamer 7.5 mm
03.028.080	Monobloc Flexible Reamer 8.0 mm
03.028.085	Monobloc Flexible Reamer 8.5 mm
03.028.090	Monobloc Flexible Reamer 9.0 mm
03.028.095	Monobloc Flexible Reamer 9.5 mm
03.028.100	Monobloc Flexible Reamer 10.0 mm
03.028.105	Monobloc Flexible Reamer 10.5 mm
03.028.000	Base – Monobloc Flexible Reamer Case
03.028.001	Lid – Monobloc Flexible Reamer Case



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.

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

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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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