Anterior Spine System

Surgical Technique

Guide
INTRODUCTION

The EXPEDİUM® Anterior Spine System is a comprehensive, semi-rigid thoracolumbar trauma system that offers implant and instrument solutions designed to enhance speed, security and simplicity. This advanced spinal system establishes a new benchmark for ease of use by incorporating simplified implant locking technologies like single-screw tightening, drop-and-lock cross connectors and a uniquely designed closure mechanism that virtually eliminates cross threading and reduces head spreading forces generated during final tightening. Combined, these features minimise the number of steps required for construct assembly while maximising surgical efficiency and security.

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Access to the patient’s left or right side of the spine is achieved by positioning the patient in a lateral decubitus position. Generally speaking, a left-sided approach is used for the thoracolumbar junction, while a right-sided approach is preferred for the mid-thoracic spine. The patient is held securely with positioners and straps.

Palpate the surface anatomy to determine the incision location. The thoracolumbar junction is commonly approached through an incision over the tenth or eleventh rib. Confirmation of the intended surgical levels can be performed using fluoroscopy.
**STEP 1: DECOMPRESSION/CORPECTOMY:**

- Disc and endplate material rostral and caudal to the damaged vertebral body is removed.
- A corpectomy is performed at the damaged level(s).
- Bone removed from the corpectomy site can be used as autologous graft material with the selected vertebral body replacement device.

**STEP 2: DETERMINE SCREW LENGTH:**

- Using the Depth Gauge, measure the width of the vertebral bodies above and below the corpectomy site. The distance measured can be used as a guide to select the correct screw length to achieve bi-cortical fixation. As a general rule, anterior screws are typically 5.0 mm shorter than posterior screws.
- Alternatively, preoperative MRI/CT scans can be used to determine width of the vertebral body.
STEP 3: STAPLE SELECTION:

- Using the provided Staple Templates, determine the appropriate sized vertebral body staple. The proper staple is selected by identifying the size that maximises the coverage of the lateral aspect of the vertebral body without violating the adjacent disc space.

- Staples come in S, M, L and XL sizes in both rostral and caudal configurations.

STEP 4A: LOADING OF STAPLE IMPACTOR:

- Attach the selected staple to the Dual Hole Staple Impactor by inserting the distal end of the instrument into the staple's oval attachment holes.

- Once inserted and seated into the attachment holes, turn the Dual Hole Staple Impactor's proximal knob clockwise to securely attach the staple to the instrument.
STEP 4B: STAPLE PLACEMENT:

- When placed, the staples should be oriented on the spine so that the anterior screw holes are further apart than the posterior screw holes. All staples are marked “A” for anterior and “P” for posterior to facilitate proper implantation. Arrows etched on the rostral/caudal staples should be pointing into the corpectomy site.

- With the Dual Hole Staple Impactor, place the staple onto the vertebral body. The staple’s round, center spike should come into contact with the bone before the peripheral spikes. If desired, the surgeon can rotate the staple via the center spike for fine adjustment on the vertebral body. The center spike design allows the surgeon to optimise his/her staple location before final impaction into the bone.

- A surgical mallet is used to impact the staple.

- To release the Dual Hole Staple Impactor from the staple, turn the proximal knob 1-2 full turns in the counter-clockwise direction.

Note: Anterior thoracolumbar exposures are generally performed from the patient’s left side. If a right-sided approach is warranted, the staples must be reversed from their left-sided orientation (Left-sided rostral staples will become right-sided caudal staples and left-sided caudal staples will become right-sided rostral staples).
STEP 4C: STAPLE PLACEMENT:

- The Finishing Staple Impactor may be used to fully seat the staple into the vertebral body if this is not accomplished with the Dual Hole Staple Impactor.

STEP 5A: CREATION OF SCREW TRAJECTORIES WITH FREEHAND AWL:

- The Freehand Awl may be used to create pilot holes to aide in screw placement. The awl will create a 15 mm deep channel into the bone to guide the Tap and/or screw.

Note: The freehand awling method should only be performed with the instrument marked Freehand Awl.
STEP 5B: CREATION OF SCREW TRAJECTORIES USING OPTIONAL AWL/TAP GUIDE BLOCK:

- The Awl/Tap Guide Blocks can be used to create defined anterior/posterior screw trajectories. There are 4 Guide Blocks (S, M, L and XL) to match the 4 different staple sizes. The Guide Blocks can be attached to the Dual Hole Staple Impactor either before or after staple impaction.

- Slide the appropriately sized Guide Block onto the Dual Hole Staple Impactor.

1. Position the Guide Block’s T-Slot on the same side as the Dual Hole Staple Impactor’s Guide Block rails.

2. Above the Guide Block rails, slide the Guide Block onto the Dual Hole Staple Impactor until the Guide Block T-slot mates with the Guide Block rails.

3. Slide the Guide Block down until it bottoms out on the Dual Hole Staple Impactor.
STEP 5C: CREATION OF SCREW TRAJECTORIES USING OPTIONAL AWL/TAP GUIDE BLOCK:

- Using the instrument marked, Guide Block Awl, create the anterior and posterior screw trajectories. The Guide Block creates converging 7.5° trajectories. The awl prepares a channel through the cortex and cancellous bone that is approximately 15 mm in depth.

  Note: The Guide Block Awl is designed specifically for use with the Guide Blocks and should not be used as a Freehand Awl.

- Follow the awl's path with the 5.0 mm Tap. The tap is graduated up to 90 mm and 30 mm needs to be subtracted from the final reading on the tap when it used with the Guide Block.

  Note: The 6.0 and 7.0 mm Taps cannot be used with the Guide Blocks and their depth is read as indicated on the instrument.
STEP 6: MONOAXIAL SCREW INSERTION:

- Thread the Monoaxial Screwdriver Shaft into the screw head.

- Slide the Monoaxial Screwdriver Sleeve down and into the rod cutouts on the screw head and insert the screws into the vertebral body.

- Screws should be inserted until the underside of the screw head comes into contact and is flush with the top of the staple. Screw openings should be parallel to the spine to allow for insertion of the rods.

Note: The Monoaxial Screws are not self-tapping. 7.0 mm screws should only be used with medium, large and extra-large staples.
STEP 7: DEFORMITY CORRECTION:

- Slide the Screw Distractor into the monoaxial screw heads either from an anterior or posterior approach. If necessary, the Screw Distractor can be further secured to the screw heads by inserting set screws into the Monoaxial Screws with the Smooth Shaft Self-Retaining Innie Inserter.

- Correction of the spinal deformity is performed until the Anterior Longitudinal Ligament (if intact) is taut.

- Insert the selected vertebral body replacement device.

- Release the Screw Distractor and remove it from the screws.

Note: The Screw Distractor is capable of traveling up to 120 mm.
STEP 8: ROD PLACEMENT AND SET SCREW INTRODUCTION:

- Using the Graft Measuring Caliper or Rod Template, measure the length of the rods required for the construct. Rods come in various pre-cut lengths.

- Insert the rods into the screw heads using the Rod Holder.

- Using the Alignment Guide and Self-Retaining Innie Inserter, fasten the rods to the screw heads by inserting the set screws.

- Provisionally tighten the rostral set screws. Provisional tightening should be performed using the Fixed Handle X25 Driver.

- Caudal set screws remain loose for compression of the construct.

STEP 9: COMPRESSION AND FINAL TIGHTENING:

- Using the Offset Rod Holder and Compressor, compress the caudal screws on both the posterior and anterior rods.

- Provisionally tighten the caudal set screws using the X25 Fixed Handle Driver.

- Using the Rod Stabiliser and Torque Wrench Assembly, lock all four set screws to 80-inch lbs.
STEP 10: CROSS CONNECTOR APPLICATION:

- Using the Cross Connector Measuring Templates determine the appropriate sized Cross Connector to apply to the rods. Cross Connectors are available in 1.0 mm increments from 13-18 mm.

- Using the Self-Retaining X25 Nurses Wrench, insert the Cross Connector Set Screw into the Cross Connector body until resistance is encountered. This should leave approximately 2 threads visible on the set screw.

- Pick up the selected Cross Connector implant from the caddy by pressing the Cross Connector Applicator into the applicator cutouts on the caddy. The cutouts will center the Cross Connector Applicator over the Cross Connector Set Screw for final tightening.
• Apply selected Cross Connectors to the rods using the Cross Connector Applicator.  
  
  Note: To properly seat cross connector on rods, push down on applicator to ensure connector fully engages rods.

• Using the Torque Wrench Assembly, tighten the Cross Connector Set Screws to 80-inch lbs.  
  
  Note: Two (2) Cross Connectors are recommended for each construct.
Indications
The EXPEDITUM Anterior Spine System is intended for anterolateral screw fixation to the T4 to L4 levels of the spine, with all metal at least 1 cm from a major vessel. The EXPEDITUM Anterior Spine System may be used in either thoracoscopic procedures or open procedures.

The EXPEDITUM Anterior Spine System is indicated for:

1. Degenerative disc disease (DDD) defined as back pain of discogenic origin with degeneration of the disc confirmed by history and radiographic studies
2. Spondylolisthesis
3. Trauma (i.e., fracture or dislocation)
4. Spinal stenosis
5. Deformities or curvatures (i.e., scoliosis, kyphosis, and/or lordosis)
6. Tumour
7. Pseudarthrosis
8. Previous failed fusion

Limited Warranty and Disclaimer
DePuy Spine 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.

WARNING: This product has labeling limitations. See package insert for complete information.

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