Surgical Technique
Guide
INTRODUCTION


EXPEDIUM Offset’s technique simplifying designs maximise performance to meet the challenge of even the most difficult pathologies.

Developed for comprehensive, multi-pathology application, EXPEDIUM Offset seamlessly integrates an unprecedented breadth of versatile and complementary components in a single implant system.

To spine surgeons trained in the treatment of complex spinal pathologies, the EXPEDIUM Offset System works in harmony with the EXPEDIUM family of in-line implants and offers uncompromising versatility to customise constructs based on the individual patient and pathology. The EXPEDIUM Offset System was developed by DePuy Spine, the company that pioneered offset technology.

EXPEDIUM OFFSET: AN EVOLUTION IN ADAPTABILITY

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The EXPEDIUM Spine System is a 5.5mm and 6.35mm rod based system offered in both titanium and stainless steel. Both systems consist of the following:

- Monoaxial screws
- Polyaxial screws
- Uni-planar screws
- Reduction screws
- Reduction hooks
- Hooks
- Extended tab implants
- Sacral extenders
- Lateral connectors
- Washers

In addition, the EXPEDIUM OFFSET Spine System is a 5.5 and 6.35mm rod and plate system, offered in both titanium and stainless steel. EXPEDIUM OFFSET will also include the following:

- Fixed bolts
- Polyaxial bolts
- Closed screws
- Hooks
- Slotted connectors
- Plates
- Nuts
- Washers
- Drop-entry connectors
- Modular cross connectors
- Transverse rod connectors
- Wires
For the purposes of clarifying terms used throughout this surgical technique, details follow on key implant features of the EXPEDIUM Offset System.

**IMPLANT TERMINOLOGY**

**FIXED BOLTS**

**POLYAXIAL BOLTS**
DUAL LEAD THREAD

All fixed and polyaxial bolts have a dual lead thread pattern. The dual lead thread advances twice as quickly as a traditional single lead thread.

SLOTTED CONNECTORS AND DUAL DIAMETER (DDVHG) TECHNOLOGY

The standard slotted connectors in the EXPEDIUM Offset System feature a dual diameter feature enabling use with either a 5.5mm or 6.35mm rod.
**IMPLANT ASSEMBLIES**

EXPEDİUM Offset provides multiple options for angulation. The first image shows the fixed bolt with no washers, and no angulation. The second image shows a fixed bolt, assembled with polyaxial washers above and below the slotted connector, providing 25° of angulation. Finally, the third image shows the EXPEDİUM Offset polyaxial bolt, offering an average 60° cone of angulation. The lowered rod slot of the slotted connector paired with the polyaxial bolt provides lower profile constructs.

**CONSTRAINED PLATES**

Constrained plates offer a single hole to avoid anatomy and the superior facet.
ANGULATING CONNECTORS

A new addition to the EXPEDIUM Offset System is the angulating connector, allowing the rod slot to rotate relative to the implant placement for desired connector positioning.

LOCKING NUTS

All locking nuts in the EXPEDIUM Offset System utilize an 8mm hexagonal drive feature.
EXPEDIUM OFFSET FIXED BOLTS

PEDICLE PREPARATION

Pedicle preparation is performed utilizing a selection of awls, pedicle probes, ball tip feelers and bone taps.

Probes and bone taps are marked to indicate appropriate length to aid in proper bolt selection.

All bolts are self-tapping. Taps are provided for surgeon preference, but are not required.

PROBES

Various probe options are offered based on patient anatomy and surgeon preference.

FIXED BOLT DRIVER INSERTION

The fixed bolt driver is placed over the bolt post until firmly seated. Once the pedicle is prepared and the correct fixed bolt length and diameter are selected, the fixed bolt is inserted into the pedicle.
Once the pedicle is prepared and the correct fixed bolt length and diameter are selected, the fixed bolt is inserted into the pedicle.

Pedicle preparation and implantation of the desired levels is completed with the appropriate fixed bolt lengths and diameters based on patient anatomy and surgeon preference.

**POLYAXIAL WASHER INSERTION**

If polyaxial motion is desired, polyaxial washers are inserted "dome down."

See Washer Directions on page 14.
**SLOTTED CONNECTOR ASSEMBLY ON RODS**

Appropriate style slotted connectors are chosen for optimal connection to each bolt.

The slotted connectors are loosely loaded onto the selected length rod with the nurse’s wrench and placed over the bolt posts.

Where polyaxial washers were placed on bolts below the slotted connectors, a second washer must be placed “dome up” on each bolt on top of the slotted connector.

Spacer washers are not placed above slotted connectors.
LOCKING NUT APPLICATION

Locking nuts are loaded from the locking nut and washer caddy. Nuts can be loaded onto a nut inserter, nut driver or intermediate/final tightening torque shaft paired with the desired handle.

With the plates and the desired washers in place, the locking nuts are threaded onto the bolts.
SLOTTED CONNECTOR FINAL TIGHTENING – STEP ONE
SLOTTED CONNECTOR FINAL TIGHTENING – STEP TWO: LOCKING NUT FINAL TIGHTENING

The red T-handled hex lobe driver (X20) is placed thru the cannula of the T-handle torque wrench to prevent bolt advancement into the pedicle.

Set at 80 inch pounds of torque, the T-handle is then rotated clockwise until it clicks and resistance is no longer evident.
POST CUTTING

If a fixed reduction bolt was used in the procedure, the post should be cut with the supplied bolt post cutter.

The retained bolt post is then ejected from the cutter using the supplied ejection pin and discarded.

NOTE: A total of two washers (two spacer washers, or one spacer washer and one polyaxial washer) will fit below a slotted connector on a pedicle bolt. If additional washers are required, a reduction bolt must be used.

WASHER DIRECTIONS

Polyaxial “Dome Up”
Where a polyaxial washer has been placed beneath a spine plate, one should be placed above in the opposite orientation, or “dome up” to mate with the bottom of the lock nut.

Polyaxial “Dome Down”
Beneath a smooth spine plate, a single polyaxial washer may be placed “dome down” into the integral nut of a pedicle or reduction bolt, or the receiving portion of a spacer washer.

Spacer
Spacer washers may only be placed beneath a slotted connector, directly into the integral nut of a pedicle or reduction bolt.

Spacer washers may not be placed on top of polyaxial washers.
Pedicle preparation is performed utilising a selection of awls, pedicle probes, ball tip feelers and bone taps.

Probes and bone taps are marked to indicate appropriate length to aid in proper bolt selection.

All bolts are self-tapping. Taps are provided for surgeon preference, but are not required.

Various probe options are offered based on patient anatomy and surgeon preference.

The requested polyaxial bolt is taken from its caddy and aligned with the polyaxial bolt driver.

The polyaxial bolt driver’s tip should be moved down the post of the bolt. When engaged, the sleeve of the polyaxial bolt driver is rotated clockwise to tighten the polyaxial bolt to the driver. Attention should be made to confirm that the bolt is securely in place and the shaft of the bolt is oriented correctly.
Once the pedicle is prepared and the correct polyaxial bolt implant length and diameter are selected, the polyaxial bolt is inserted into the pedicle.

To adjust the height of the polyaxial bolt in the anatomy, it may be rotated counter-clockwise.

Once proper elevation above the pedicle is achieved, the polyaxial bolt head can be adjusted and positioned using the head adjuster (the fixed bolt driver located in the bolt insertion tray).

Pedicle preparation and implantation of the desired levels is completed with the appropriate polyaxial bolt lengths and diameters based on patient anatomy and surgeon preference.
**SLOTTED CONNECTOR PLACEMENT ON POLYAXIAL BOLTS**

Appropriate style slotted connectors are chosen for optimal connection to each bolt.

The slotted connectors are loosely loaded onto the selected length rod and placed over the threaded posts of the bolts.

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**LOCKING NUT APPLICATION**

Locking nuts are loaded from the locking nut and washer caddy. Nuts can be loaded onto a nut inserter, nut driver or intermediate/final tightening torque shaft paired with the desired handle.
The locking nuts are threaded onto the bolts.
The T-handle is then rotated clockwise until it clicks and resistance is no longer evident.

The closed connection stabiliser is used to prevent torsion of the construct during final tightening.

The T-handle torque wrench is always set to 80 inch pounds of torque for set screw tightening.

The X-25 set screws in the slotted connectors should always be torqued before final tightening of the nuts on the bolt posts.
SLOTTED CONNECTOR FINAL TIGHTENING – STEP TWO

The red T-handled hex lobe driver (X20) is placed thru the cannula of the T-handle torque wrench to prevent bolt advancement into the pedicle.

Set at 80 inch pounds of torque, the T-handle is then rotated clockwise until it clicks and resistance is no longer evident.
Hook sites are chosen preoperatively or intra-operatively by the surgeon.

The appropriate hook starter is utilised based on surgeon preference to prepare each selected hook site.
PEDICLE HOOKS

The hook driver can be used in conjunction with the open hook holder to position the pedicle hook.

The rod is captured into the pedicle hook by inserting the set screws.

Final tightening is performed, utilising the open hook stabiliser, and tightening the set screw to 80 inch pounds.
TRANVERSE PROCESS HOOKS

The hook driver can be used in conjunction with the open or closed hook holder to position an open or closed hook on the transverse process.

Open or closed hooks may be used according to surgeon preference.

CLOSED HOOK PLACEMENT

Ensure closed hook body is clear of the set screw prior to insertion of the rod.

The rod is placed through the hook. Compression may be required. Compression and distraction maneuvers are facilitated thru interim tightening and loosening of set screw.

When final hook placement is completed, it is followed by final tightening utilising the closed hook stabiliser and tightening to 80 inch pounds of torque.

OPEN HOOK PLACEMENT AND TIGHTENING

Open hook placement is consistent with placement of closed hooks; however, the rod is captured into the open hook by inserting the set screw.

Compression and distraction can be facilitated by interim tightening of the set screw and utilising the appropriate compressor and distractor.

Final tightening is also completed to 80 inch pounds of torque. Counter-torque is applied using the open hook stabiliser.
LAMINAR HOOK PLACEMENT

The hook driver can be used in conjunction with the open or closed hook holder to position an open or closed hook on the lamina.

Open or closed hooks may be used according to surgeon preference.

The X25 final tightener is placed in the hook stabiliser for closed hooks (shown) or open hooks.

The stabiliser is lowered over the hook and final tightening is performed to 80 inch pounds of torque.

REMOVAL INSTRUCTIONS

If a decision is made to remove the implants after solid fusion occurs, the following steps should be taken after the implant is exposed.

1. Clean debris/tissue from the locking nuts and set screws.
2. Loosen locking nuts on the bolt posts with an 8mm wrench after placing the T-20 counter torque down the bolt post, and remove.
3. Once the locking nuts are loose, the rods and slotted connectors or plates can be removed.
4. If necessary, the set screws on the slotted connectors may be loosened with the X-25 screwdriver.
5. With polyaxial or fixed bolt heads visible, utilise the appropriate screwdriver to back the screw out of the pedicle.
IMPLANT OPTIONS

FIXED BOLTS

FIXED REDUCTION BOLTS

POLYAXIAL BOLTS

POLYAXIAL REDUCTION BOLTS

4.35 mm
5.0 mm
6.0 mm
7.0 mm
8.0 mm
9.0 mm
SLOTTED CONNECTORS (DUAL DIAMETER 5.5 MM AND 6.35 MM)

- Standard
- Extended
- Downsized
- Angled
- Offset Left & Right
- Mini Offset Left & Right

SLOTTED CONNECTORS FOR POLYAXIAL BOLTS (DUAL DIAMETER 5.5 MM AND 6.35 MM)

- Standard
- Extended
- Downsized
- Offset Left & Right
- Mini Offset Left & Right

ANGULATING CONNECTORS

- 5.5 mm
- 6.35 mm

TWISTERS
BAND CLAMP

SPLIT CONNECTORS

OPEN CONNECTORS

CLOSED ILIAC BOLTS

FIXED ILIAC BOLTS

LOCKING NUTS/WASHERS

Polyaxial  Spacer  Locking
MISC

DROP ENTRY CONNECTOR

CLOSED HOOKS (ALL SIZES AVAILABLE IN 5.5 MM AND 6.35 MM)

Closed Pedicle
Closed Narrow
Closed Wide Blade
INDICATIONS
The EXPEDİUM® Spine System is intended to provide immobilization and stabilization of spinal segments in skeletally mature patients as an adjunct to fusion in the treatment of acute and chronic instabilities or deformities of the thoracic, lumbar and sacral spine.

The EXPEDİUM Spine System is intended for noncervical pedicle fixation and nonpedicle fixation for the following indications: degenerative disc disease (defined as back pain of discogenic origin with degeneration of the disc confirmed by history and radiographic studies); spondylolisthesis; trauma (i.e., fracture or dislocation); spinal stenosis; curvatures (i.e., scoliosis, kyphosis, and/or lordosis); tumor; pseudoarthrosis; and failed previous fusion in skeletally mature patients.

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.

WARNINGS, PRECAUTIONS AND CONTRAINDICATIONS: In the USA, 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.

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