CONDUIT™ Cervical System
EIT™ Cellular Titanium
Surgical Technique
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Indications and Contraindications

**Intended use / Indications**
The EIT™ Cellular Titanium Cervical Cages are intervertebral body fusion devices intended for use for anterior cervical interbody fusion in skeletally mature patients with cervical disc degeneration and/or cervical spinal instability, as confirmed by imaging studies (radiographs, CT, MRI), that results in radiculopathy, myelopathy, and/or pain at multiple contiguous levels from C2 - T1.
The EIT Cellular Titanium Cervical Cages are also to be used with supplemental fixation systems that have been cleared for use in the cervical spine.
The EIT Cellular Titanium Cervical Cages are designed for use with autogenous and/or allogeneic bone graft comprised of cancellous, and/or corticocancellous bone graft to facilitate fusion.

**Contraindications**
Do not use the EIT Cellular Titanium Cervical Cage in cases of:
- Any medical or surgical condition precluding the potential benefit of spinal surgery
- Acute or chronic systemic, spinal or localized infections
- Severe osteoporosis or osteopenia which may prevent adequate fixation and thus preclude the use of these or any other orthopedic implant
- Severe instabilities
- Vertebral body fractures
- Spinal tumors
- Systemic and metabolic diseases
- Conditions that may place excessive stress on bone and implants, such as severe obesity
- Pregnancy
- Dependency on pharmaceutical drugs, drug abuse, or alcoholism resulting in a lack of patient cooperation
- Prior fusion at the level(s) to be treated
- Demonstrated allergy or foreign body sensitivity to the implant material
Product Overview

CONDUIT™ Cervical Implant

Lattice Structure Geometry
• ~80% porosity1
• ~700 μm diamond pore size²

Dome shaped
Dome shaped to fit endplate anatomy³,⁴

Rough surface
Rough elevated surface

Grafting
Designed to allow for bone grafting

Various sizes
2 footprint sizes for maximized endplate contact
• Small (S) = 12 x 16 mm
• Large (L) = 14 x 18 mm

Various heights
6 heights in 1mm increments
• 5-10 mm

Several angles
4° and 8° lordosis angle for spinal alignment and sagittal balance

Lateral wedge
Lateral wedge design for maximal contact of the uncovertebral joint

References:
1. VAL2016-043 Strut diameter summary rev 0.
2. EIT Scaffold characteristics P773 Signed Report_DM 20180417.
4. EIT Implant Sizing Guides.
## CONDUIT Cervical Implants

### 4° Angle

<table>
<thead>
<tr>
<th>Height</th>
<th>Small</th>
<th>Large</th>
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<tbody>
<tr>
<td>5 mm</td>
<td>CUI4050S</td>
<td>CUI4050L</td>
</tr>
<tr>
<td>6 mm</td>
<td>CUI4060S</td>
<td>CUI4060L</td>
</tr>
<tr>
<td>7 mm</td>
<td>CUI4070S</td>
<td>CUI4070L</td>
</tr>
<tr>
<td>8 mm</td>
<td>CUI4080S</td>
<td>CUI4080L</td>
</tr>
<tr>
<td>9 mm</td>
<td>CUI4090S</td>
<td>CUI4090L</td>
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<tr>
<td>10 mm</td>
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### 8° Angle

<table>
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<tbody>
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<td>CUI8080S</td>
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</tr>
<tr>
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<td>CUI8090L</td>
</tr>
<tr>
<td>10 mm</td>
<td>CUI8100S</td>
<td>CUI8100L</td>
</tr>
</tbody>
</table>

![Diagram of CONDUIT Cervical Implants]

- **Height**
  - Small
  - Large
- **Angle**
  - 4°
  - 8°

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## Instruments

### Trials

#### 4° Angle

<table>
<thead>
<tr>
<th>Height</th>
<th>Small</th>
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<tbody>
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<tr>
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<td>CET2070L</td>
</tr>
<tr>
<td>8 mm</td>
<td>CET2080S</td>
<td>CET2080L</td>
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<tr>
<td>9 mm</td>
<td>CET2090S</td>
<td>CET2090L</td>
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#### 8° Angle

<table>
<thead>
<tr>
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<th>Large</th>
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<tbody>
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Instruments

<table>
<thead>
<tr>
<th>Part</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>Inserter Tube</td>
</tr>
<tr>
<td>B</td>
<td>Gripper</td>
</tr>
<tr>
<td>C</td>
<td>Stopper</td>
</tr>
<tr>
<td>D</td>
<td>Tail wheel</td>
</tr>
<tr>
<td>E</td>
<td>Tube wheel</td>
</tr>
</tbody>
</table>

CET30101  Inserter

CET30131  Slender Inserter
Instruments

CET30201  Impactor

CET60100  Removal forceps

CEC00101  Cervical Instrument Tray - fits 15 trials

CEC00199  Cervical Tray Insert - fits 5 additional trials
**Surgical Technique**

**Preparation and Approach**

Place the patient in the supine position with slight extension to facilitate access to the anterior cervical spine. Locate the correct operative level and incision site with fluoroscopy. Use the medial anterior approach for C2-T1 and dissect the affected disc space per the standard operating procedure for an anterior cervical discectomy and fusion. (Figure 1)

**Discectomy and Endplate Preparation**

Use a Caspar Distractor to distract the space. Perform microsurgical decompression to relieve all points of neural compression and prominent ventral spondylosis ridges, preserving the uncovertebral joints and subchondral bone as much as possible. Perform the discectomy using curettes, rongeurs, rasps, or high speed drills. The vertebral bony endplates need to stay intact and it is important to thoroughly remove the cartilaginous material from these surfaces. The implant is intended to laterally rest on the uncovertebral joints. Carefully prepare the disc space symmetrically to ensure an optimal width for an appropriate cage fit. (Figure 2)

**Determination of Cage Size**

Choose an appropriately sized trial. “Lollipop” Trials are available matching footprint, height, and angle of each implant. Ensure the side marked “TOP” is cranial and position the Trial in the intervertebral disc space. Evaluate the fit by tactile feedback and, if necessary, fluoroscopy. Repeat until a suitable match is found and then remove the Trial. (Figure 2)

**Note:** Implants are slightly higher (0.25 mm) than the Trials due to the implant’s off-set dome shaped porous structure.
Inserter options
1. Inserter: Inserter-Forceps, no assembly required. (Figure 3)
2. Slender Inserter: Pencil shaped inserter, assembly required. (Figure 4)

Slender Inserter Assembly

The Slender Inserter consists of five parts that must be assembled (Figure 5). Connect the Tube wheel (part E) to the Inserter Tube (part A). Slide the Gripper (part B) in the Inserter Tube (part A) and Tube Wheel (part E) to prevent the Tube Wheel from falling off of the Inserter Tube. Connect the Tail Wheel (part D) to the Tube Wheel (part E). Slide the Stopper (part C) into the Gripper and both wheels and turn the Tail Wheel clockwise to complete assembly. Ensure the wings at the front of the Stopper slide over the Gripper. Turn the Tail Wheel to change the position of the Stopper. Make sure the Gripper is in the open position by turning the Tube Wheel.

Implant - Inserter connection

Upon selecting the appropriate Trial, remove the implant from its sterile packaging.
1. Attach the implant to the Inserter: (Figure 6)
   • Make sure the Inserter is in the open position (tips are apart).
   • Place the implant between the tips. Make sure the side marked 'TOP' on the implant is cranial.
   • Lock the implant with the grip notches between the tips by pressing the grips together and turning the wheel of the Inserter.
   • Confirm that the implant is securely connected to the Inserter.
2. Attach the implant to the Slender Inserter:
   • Make sure the Slender Inserter is in the open position (tips are apart), and the Stopper is located near the tube (turn Tail Wheel clockwise).
   • Place the implant between the tips. Make sure the side marked 'TOP' on the implant is cranial.
   • Lock the implant by rotating the Tube Wheel clockwise.
   • Set the preferred distance of the Stopper from the implant by turning the Tail Wheel.
   • Confirm that the implant is securely connected to the Inserter.
Surgical Technique

Implant Insertion

The implant should be packed with bone graft to facilitate the fusion process. Insert the implant into the intervertebral disc space. The implant should be positioned posteriorly to fit the concavity of the inferior endplate of the superior vertebral body. Confirm the position of the implant with fluoroscopy. The posterior edge of the implant should be at least 2 mm anterior to the dura. Detach the Inserter from the implant, by opening the Inserter Forceps (Figure 7) or turning the Tube Wheel counter clockwise to open up the tips of the Slender Inserter.

If repositioning is needed, the Impactor can be used to position the implant further into the vertebral disc space. The vertebral body stops of the Impactor allow the implant to be inserted up to 3 mm deep into the intervertebral space. The use of fluoroscopy is recommended during implantation to ensure proper positioning.

Completion of Surgery / Postoperative Care

After implanting the cage and removing the Caspar Distractor, close the wound. The use of the CONDUIT cervical cage does not require any specific postoperative care and the patient should be treated according to hospital and medical standards.

Implant Removal / Revision surgery

Removal with the Removal Forceps:
- Make sure the forceps are in the open position (tips are apart).
- Place the tips of the Removal Forceps into the implant and close the forceps. The tips should now grasp the implant inside the cavities.
- Remove the implant from the intervertebral disc space. (Figure 8)

Warning: Do not use the Removal Forceps for implantation. The lack of a stop could result in an error of placing the device too deep into the disc space resulting in spinal cord injury.
Instructions for Use

Please ensure that you have understood these instructions for use before using the product.

Description
The EIT Cellular Titanium Cervical Cage is an implant made from a titanium alloy for the anterior stabilization of the cervical spinal column using an Anterior Cervical Discectomy and Fusion (ACDF) surgery. EIT Cellular Titanium Cervical Cages are offered in a variety of geometries and sizes to accommodate patient anatomy.

Material
The EIT Cellular Titanium Cervical Cage is made from titanium 6-aluminum 4-vanadium alloy (ASTM-F3001). It is supplied sterile and is available in a variety of heights, footprints and lordosis angles.

Intended use / Indications
The EIT Cellular Titanium Cervical Cages are intervertebral body fusion devices intended for use for anterior cervical interbody fusion in skeletally mature patients with cervical disc degeneration and/or cervical spinal instability, as confirmed by imaging studies (radiographs, CT, MRI), that results in radiculopathy, myelopathy, and/or pain at multiple contiguous levels from C2 - T1.

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Contraindications
Do not use the EIT Cellular Titanium Cervical Cage in cases of:
• Any medical or surgical condition precluding the potential benefit of spinal surgery
• Acute or chronic systemic, spinal or localized infections
• Severe osteoporosis or osteopenia which may prevent adequate fixation and thus preclude the use of these or any other orthopedic implant
• Severe instabilities
• Vertebral body fractures
• Spinal tumors
• Systemic and metabolic diseases
• Conditions that may place excessive stress on bone and implants, such as severe obesity
• Pregnancy
• Dependency on pharmaceutical drugs, drug abuse, or alcoholism resulting in a lack of patient cooperation
• Prior fusion at the level(s) to be treated
• Demonstrated allergy or foreign body sensitivity to the implant material

Adverse reactions
Adverse reactions may include:
• Clinical failure (i.e. pain or injury) due to bending, loosening, wear and tear, fracture, loss of fixation, dislocation and/or migration
• Pain, discomfort and/or abnormal sensations due to the presence of the implant
• Primary and/or secondary infections
• Allergic reactions to a foreign body, or implant material sensitivity
• Neurological injury due to surgical trauma or presence of the device, tethering of nerves in scar tissue, muscle weakness and paraesthesia
• Fracture of vertebrae or other bony structures
• Decrease in bone density due to stress shielding
• Degenerative changes or instability of segments adjacent to fused vertebral levels
• Dural tears experienced as a result of surgery could result in need for further surgery for dural repair, a chronic CSF leak or fistula, and possible meningitis
• Injury to vessels, nerves and organs; malpositioned implants adjacent to large arteries or veins could erode these vessels and cause catastrophic bleeding in the late postoperative period
• If a pseudarthrosis occurs coupled with the implant, mechanical grinding may occur which might generate wear debris. Most types of wear debris have shown the potential of initiating local osteolysis in articulating joints. Wear debris can also cause other possible local or systemic adverse reactions.
• Reflex sympathetic dystrophy
• Hematoma and/or impaired wound healing; hemorrhage
• Venous thrombosis, lung embolism, and cardiac arrest
• Nonunion or delayed union
• Spinal cord impingement or damage
• Paralysis
• Bursitis
• Death

Note: This list may not include all complications caused by the surgical procedure itself

Safety precautions
• Prior to use, thoroughly read these instructions for use and become familiar with the surgical technique.
• Keep the instructions for use accessible to all staff.
• The operating surgeon must have a thorough command of both the hands-on and conceptual aspects of the established operating techniques. Proper surgical performance of the implantation is the responsibility of the operating surgeon.
• The manufacturer is not responsible for any complications arising from incorrect diagnosis, choice of incorrect implant, incorrect operating techniques, the limitations of treatment methods or inadequate asepsis.
• Under no circumstances may modular implant components from different suppliers be combined.
• Each patient’s record shall document the implant used (article number, description and lot number).
• During the postoperative phase, it is of particular importance that the physician keeps the patient well informed about post-surgical behavioral requirements.
• Damage to the weight-bearing structures can give rise to loosening, dislocation and migration, as well as other complications. To ensure the earliest possible detection of such catalysts of implant dysfunction, the implant must be checked periodically post-operative using appropriate techniques.
• Patients with previous spinal surgery at the level(s) to be treated may have different clinical outcomes compared to those without a previous surgery.
• Never reuse an implant. Although the implant may appear undamaged, previous stresses may have created nonvisible damage that could result in implant failure.
• Never use an implant if its packaging is damaged.
• An implant with damaged packaging might be damaged itself and thus may not be resterilized or used.
• Never use an implant that is past its expiration date.

Storage, inspection and resterilization

Storage
The implant is individually packed in protective packaging that is labeled according to its contents. The implant is sterilized with gamma sterilization (25 kGy minimum).
• Always store the implant in the original protective packaging.
• Do not remove the implant from the packaging until immediately before use.
• Store the implant in a dry and dust-free place (standard hospital environment).

Disinfection/cleaning
The implant is not designed to be disinfected or cleaned by the user.

Resterilization
The implant is not designed to be resterilized by the user.

Magnetic Resonance (MR) compatibility
Non-clinical testing has demonstrated that the EIT Cellular Titanium Cervical Cage is MR Conditional and can be scanned safely under the following conditions:
• Static magnetic field of 1.5-Tesla (1.5 T) or 3-Tesla (3 T).
• Spatial gradient field of up to 3,000 G/cm (30 T/m) for 1.5 T and 3 T systems.
• Maximum whole body averaged specific absorption rate (SAR) of 4.0 W/kg for 15 minutes of scanning in First Level Controlled Operating Mode at 1.5 T and 3 T.

1.5 T and 3T RF heating
Under the scan conditions above, the EIT™ Cellular Titanium Cervical Cage is expected to produce a maximum temperature rise of less than 0.5°C after 15 minutes of continuous scanning.

Warning: The RF heating behavior does not scale with static field strength. Devices that do not exhibit detectable heating at one field strength may exhibit high values of localized heating at another field strength.

MR Artifact
In testing with gradient-echo sequencing, the shape of the image artifact follows the approximate contour of the device and extends radially up to 1.7 cm from the device.

Procedure
Only implant the EIT Cellular Titanium Cervical Cage with the applicable EIT cervical instruments.
Note: The EIT cervical instruments are available from the manufacturer at any time.

Preoperative
The operating surgeon draws up an operation plan specifying and documenting the following:
• Implant component(s) and their dimensions; correct selection of the proper implant size is imperative for best outcomes.
• Proper position of the implant component(s)
• Determination of intraoperative orientation points

The following conditions must be fulfilled prior to application:
• All required implant component(s) are available.
• Highly aseptic operating conditions are present.
• All requisite implantation instruments are available and in working order.

Warning: Never use or process damaged or defective instruments. Contact your local representative or dealer for repair or replacement.

Warning: The use of an instrument for tasks other than those for which they are intended may result in damaged/broken instruments or patient injury.
• The operating surgeon and operating room team are thoroughly familiar with the operating technique, as well as the range of implants and instruments to be applied. Complete information on these subjects is readily available at the workplace.
• The operating surgeon is especially trained in spinal surgery, biomechanical principles of the spine and the relevant operating techniques.

The operating procedure must be explained to the patient, and the patient’s understanding of the following information must be documented:
• The patient is aware of the risks associated with neurosurgery, general surgery, orthopedic surgery and with general anesthesia.
• The patient has been informed about the advantages and disadvantages of the implant procedure and about possible alternative treatments.
• The implant can fail due to excessive load, wear and tear, or infection. Internal fixation devices are load-sharing devices that are used to obtain an alignment until normal healing occurs. If healing is delayed, or does not occur, the implant may eventually break produced by weight bearing, and activity levels will, among other conditions, dictate the longevity of the device. Notches, scratches, or bending of the implant during the course of surgery may also contribute to early failure.

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Instructions for Use

• The service life of the implant is determined by body weight and physical activity. The implant must not be subjected to overload through extreme strain, or through work-related or athletic activities.
• Corrective surgery may be necessary if the implant fails.
• The patient must have a physician carry out follow-up examinations of the implant at regular intervals.

Intraoperative
Prior to use, inform yourself in the product brochure about the operating technique, the related implants and the instruments.

Prior to use, verify the integrity of the sterile packaging and check the product expiration date.

Warning: Never use the implants if the packaging is damaged.
Warning: Never use implants that are past their expiration date.

The EIT Cellular Titanium Cervical Cage is implanted using a standard anterior approach to the cervical spine. Adequate cleaning and preparation of the endplates is necessary to allow for good bone contact of the device.

• Determine the appropriate implant size with the Trial.
• Place the implant into position using the Inserter.
• If necessary, slightly adjust the location of the implant using the impactor under X-ray control.

In cases of instability, consider supplemental internal fixation using a cervical plating system.

Warning: When performing cauterization around an implant, avoid contact with the implant.

Postoperative
• Reiterate preoperative instructions to the patient.
• Ensure that the patient is aware of physical activity restrictions and possible adverse reactions.

Revision surgery / Implant removal
The EIT Cellular Titanium Cervical Cage is intended for permanent implantation and is not intended for removal. However, removal may be advisable in the following situations:
• Implant breakage, migration or other clinical failure
• Pain due to the implant
• Infection

The Removal Forceps can be used to grasp and remove the implant if necessary.
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.

WARNING: In the USA, this product has labeling limitations. See package insert for complete information.

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

Some devices listed in this surgical technique 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.