

POSTERIOR SPINE TRUSS SYSTEM (PSTS) INTERBODY FUSION DEVICE
INSTRUCTIONS FOR USE (ENGLISH)
PLEASE READ CAREFULLY

CAUTION: FEDERAL LAW (USA) RESTRICTS THESE DEVICES TO SALES BY OR ON THE ORDER OF A PHYSICIAN.

INTENDED USE: The Posterior Spine Truss System (PSTS) Interbody Fusion Device is designed to provide mechanical support to the posterior spine while biologic fusion takes place.

DEVICE DESCRIPTION: The device is an open architecture truss design mathematically formulated to provide structural support with open space throughout the implant for bone growth and fusion. The 4WEB additive manufacturing process provides a hierarchical surface roughness. The implant is made from Ti6Al4V alloy.

The device is available in a variety of sizes and lordotic angles to accommodate the patient's anatomy.

INDICATIONS FOR USE: The Posterior Spine Truss System (PSTS) Interbody Fusion Device is indicated for use in skeletally mature patients with degenerative spinal conditions such as spondylolisthesis or degenerative disc disease (DDD) at one or two contiguous levels from L2-L1. DDD is defined as discogenic back pain with disc degeneration and disc discoloration by patient history and radiographic studies. The device is intended to be used with supplemental fixation and must be used with autograft and/or allogeneic bone graft comprised of cancellous and/or corticocancellous bone graft. These 600 patients may also have up to Grade I spondylolisthesis or retrolisthesis at the involved level(s).

CONTRAINDICATIONS: The PSTS Interbody Fusion Device should not be implanted in patients with:

- An active infection at the operative site or other active systemic infections
 - Tumor involvement at the operative site
 - Prior fusion at the level(s) to be treated
 - Known sensitivity to the material
- WARNINGS AND PRECAUTIONS:** Safety and effectiveness have not been established in the following conditions:
- Drug or obesity
 - Smoking
 - Three or more levels to be fused
 - Symptomatic cardiac disease
 - Pregnancy
 - Previous attempts at the involved level(s)
 - Spondylolisthesis or retrolisthesis greater than Grade I
 - Significant loss of bone stock as seen with osteoporosis or osteomalacia
 - Conditions requiring chronic corticosteroid use
 - Active drug abuse

The PSTS Interbody Fusion Device is for single use only.

Bending or fracture of the implants or instruments can occur if not handled properly.

All instruments and instrumentation are provided non-sterile and must be steam sterilized prior to use. The 4WEB Spine Truss System Implants are intended to be used together with the 4WEB Spine Truss System instrumentation during spinal fusion interventions.

No implant should be reused if it has come in contact with blood or other bodily fluids.

All implants, sizers and instrumentation should be inspected prior to use for possible damage or defects. Any damaged or defective component should not be used and should be returned to 4WEB.

Interbody fusion devices are intended to provide mechanical support while biologic fusion occurs. In the event of pseudarthrosis or delayed fusion, the risk of implant migration, loosening or breakage increases. The physician/surgeon should consider the levels of implantation, patient weight, patient activity level, other patient conditions, etc which may impact the performance of the system.

Only surgeons trained in lumbar spine fusion procedures should implant this device.

For disposal of a product that has come in contact with body fluids, follow standard hospital procedures for disposing of biologically hazardous material. For disposal of a product that has not been in contact with body fluids, follow procedures for removal of hospital waste in force within the institution.

OPERATIVE PRECAUTIONS: The surgeon is to be thoroughly familiar with the PSTS Interbody Fusion Device, methods of application, instruments and surgical techniques. Correct positioning of the PSTS Interbody Fusion Device relative to the vertebral canal should be checked preoperatively with x-ray. The size (and more particularly the height) of the PSTS Interbody Fusion Device must be chosen on the basis of the patient's anatomy and desired correction.

The PSTS Interbody Fusion Device is to be filled with autologous and/or allogeneic bone graft. The implants are for single-use only. An explanted implant must never be re-implanted. Stressors on fracture, even though not noticeable by visual inspection, may have been created during initial implantation.

Following implantation, the product number and manufacturing lot number of the device that has been implanted must be reported in the patient's surgical file.

POTENTIAL ADVERSE EVENTS: Potential adverse events may be related to surgery in general, spine surgery specifically or the device. These may include but are not limited to the following:

- Adverse events related to surgery, reactions to anesthesia, the anesthetic or other medications; bleeding; infection; ileus; blood vessel damage; nerve or soft tissue damage; atelectasis; pneumonia; hematoma; seroma; wound dehiscence or incisional hernia; uterine problems; embolism; anemia; colitis; thromboembolitis; heart attack; stroke; or death.
- Adverse events related to surgery, including dural tear and CSF leak; nerve damage leading to radiculopathy, myopathy, paraparesis, paresis or paralysis; meningitis; vertebral body damage or fracture; ligament damage; fractured sacrum; or retrograde ejaculation.
- Adverse events related to the device: implant crack or fracture, failure to achieve fusion, implant migration, dislodgement, or metal sensitivity to a foreign body, including possible tumor formation. Additional surgery may be required for implant removal, repositioning or replacement. Additional stabilization at the implanted level or surgery at another disc level may be necessary if non-union or anatomic change at an adjacent level develops.

POSTOPERATIVE CARE: The physician's postoperative directions and warnings to the patient and the corresponding patient compliance are extremely important.

Detailed instructions on the use and limitations of the device must be given to the patient. The patient must be warned that loosening, and/or breakage of the device(s) are complications which may occur after surgery. The patient must be advised not to smoke or consume alcohol during period of the bone fusion process.

The patient must be advised of the inability to bend at the point of spinal fusion and taught to compensate for this permanent physical restriction in body motion.

It is critical that immobilization of union is established and confirmed by roentgenographic examination. This may require a second roentgenogram, or a second visit, and / or break, the devices must be revised and / or removed immediately before serious injury occurs.

MRI SAFETY INFORMATION: Non-clinical testing has demonstrated the PSTS Interbody Fusion Device is MR Conditional. A patient with this device can be safely scanned in an MR system meeting the following conditions:

- Static magnetic field of 3 T or 1.5 T
- Maximum spatial field gradient of 1900 gauss/cm (19 T/m)
- Maximum MR system reported, whole body averaged specific absorption rate (SAR) of ≤ 2 W/kg (Normal Operating Mode)

Under the scan conditions defined above, non-clinical testing results indicate the PSTS Interbody Fusion Device produces a maximum temperature rise of no more than 5.0°C after 15 minutes of continuous scanning.

In non-clinical testing, the image artifact caused by the device extends approximately 28 mm from the PSTS Interbody Fusion Device when imaged with a gradient echo pulse sequence and a 3 T MR system.

PACKAGING: PSTS Interbody Fusion Device is provided sterile and is clearly labeled as such in an unopened sterile package provided by 4WEB. The contents are considered sterile unless the package is damaged, opened, or the expiration date on the device label has passed. The integrity of the packaging should be checked to ensure that the sterility of the contents is not compromised.

Implants supplied sterilized from 4WEB must not be re-sterilized.

PSTs ancillary instrumentation is provided non-sterile and is supplied in a tray that is used for steam sterilization prior to use in the operating room. In the case of instrument restock, individual items will be sent in a plastic bag labeled for that device.

Storage conditions must maintain the integrity of the implants, associated ancillary instruments and their respective packaging. The condition of all implants and instruments must be checked before use. Damaged products must not be used and should be returned to 4WEB.

INFORMATION FOR CLEANING AND STERILIZATION OF SURGICAL INSTRUMENTS:

CAUTION: THESE INSTRUCTIONS DO NOT APPLY TO SINGLE-USE DEVICES.

The instruments used to implant the PSTS Interbody Fusion Device do not have an indefinite functional life. All reusable instruments are subjected to repeated stresses related to bone contact, impaction, routing, cleaning, and sterilization processes. Instruments should be carefully inspected before use that they are fully functional.

All ancillary instruments of the PSTS Interbody Fusion Device are delivered non-sterile and therefore, must be decontaminated, cleaned and sterilized prior to surgical use. Decontamination reduces the population of microorganisms and facilitates the subsequent cleaning stage. Strict compliance with the instructions for use regarding decontamination and cleaning is mandatory, particularly the concentration and exposure time requirements. Thorough rinsing with water must be conducted following decontamination and cleaning.

• Decontamination: Each hospital must use their own validated decontamination procedures.

• Cleaning: Wash instruments in a LANCER type or equivalent ISO 15833-1 and ISO 15833-2 compliant washing machine with the appropriate cleaning products, rinse, and dry. Any product which may alter the material is prohibited, i.e. bleach, formalin, hypochlorite solutions, saline solution, etc.

The reprocessing instructions provided have been validated as being capable of preparing reusable 4WEB instruments. It is the responsibility of the reprocessor to ensure that the reprocessing is actually performed using appropriate equipment, materials, and personnel to achieve the desired result. This normally

requires validation and routine monitoring of the process. Any deviation by the reprocessor from these instructions should be evaluated for effectiveness and potential adverse consequences.

WARNINGS:

- Follow the instructions and warnings issued by the suppliers of any cleaning and disinfection agents and equipment used.
- Do not exceed 140°C (284°F) during reprocessing steps.

• Highly alkaline conditions can damage products with aluminum parts.

• Avoid using abrasive detergents as these will promote corrosion.

• Scratches or dents can result in breakage.

• For instruments produced by another manufacturer, refer to the manufacturer's instructions for use.

• Care should be taken to remove any debris, tissue or bone fragments that may collect on the instrument.

LIMITATIONS ON REPROCESSING:

• End of useful life is generally determined by wear or damage in surgical use.

• Carefully inspect instruments between uses to verify proper functioning and configuration.

• Damaged instruments must be replaced to prevent potential patient injury such as loss of metal fragments during the surgical site.

DECONTAMINATION CONSIDERATIONS – CRETZUFELDT-JAKOB DISEASE (CJD):

• Under certain classifications of risk, the World Health Organization (WHO) or local regulatory authorities recommend special CJD (Creutzfeldt-Jakob Disease) inactivation processing procedures. For use of this product outside the United States, consult WHO and local regulations for further information.

REPROCESSING INSTRUCTIONS
CARE AT THE POINT OF USE

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CLEANING:

ALL INSTRUMENTS (for instruments requiring disassembly for cleaning may be found in the Surgical Technique Manual ST-PSTS-01).

• Prepare an enzymatic cleaning solution in accordance with the manufacturer's instructions (1oz Enzol, or equivalent, per gallon of purified water). Note: the enzyme solution must be changed on a regular basis.

• Soak soiled instruments for 5 minutes in the enzymatic solution.

• Use a soft bristle brush to remove all traces of blood and debris; pay close attention to any hard-to-reach areas, creases, and/or crevices.

• Rinse the instrument thoroughly with purified water.

• Dry the instrument immediately after final rinse.

• Clean using the "INSTRUMENT CYCLE" in a validated washer disinfector and pH neutral cleaning agent intended for medical devices. The cleaning cycle should incorporate enzymatic pre-wash, wash, rinse, thermal rinse, and dry steps.

• Place heavier instruments on the bottom of containers. Do not place heavy instruments on top of delicate instruments.

• For instruments with concave surfaces, such as curettes, place instrument with the concave surface facing downward to facilitate draining.

CLEANING INSPECTION:

• Inspect all instruments to verify that all visible debris is removed during cleaning and prior to sterilization. If debris is still visible after cleaning, repeat the cleaning process.

MAINTENANCE INSPECTION AND FUNCTIONAL TESTING:

• Visually inspect all instruments to ensure no damage and wear.

• Ensure there are no cracked handles and shafts are secure in handles.

• Ensure long instruments are free of any bending and distortion.

• Ensure instrument tips are free of defects or burns.

• Ensure reprocessing instruments with moving parts function appropriately.

WRAPPING:
WRAPPING TECHNIQUE

• Use instrument trays to contain instruments that are provided in sets.

• Biological or Chemical Indicators (BIs or CIs) used for monitoring the performance of sterilization processes should be placed in the middle racks within wrapped trays. They should be tested according to the instructions provided in the 4WEB Sterilization Technique Manual ST-PSTS-01.

• Double wrap instruments in accordance with local procedures, using standard wrapping techniques such as those described in ANSI/AAMI ST79.

• Use only FDA-cleared wraps.

• Label the contents of the wrapped tray using an indelible marker or other sterilization compatible label.

• Allow 1 inch of free space between the instrument tray and the inside of the container lid for effective protection.

STERILIZATION:

• Use a validated, properly maintained and calibrated steam sterilizer.

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