

CERES[®]-C STAND-ALONE CERVICAL SYSTEM IMPLANTS AND INSTRUMENTATION

This package insert covers the Ceres-C Stand-Alone Cervical System and Manual Surgical Instruments that are used for the implantation of this system.

GENERAL INFORMATION

The Ceres-C Stand-Alone Cervical System includes a PEEK spacer conforming to ASTM F2026 with tantalum x-ray markers conforming to ASTM F560, and a titanium alloy (Ti-6Al-4V ELI) interbody plate and screws conforming to ASTM F136. The spacer component is assembled to the interbody plate and implanted anteriorly. The endplate contacting surfaces of the spacer component include serrations, and the plate component includes two holes for inserting one bone screw in each vertebral body. The plate component also includes a screw lock at each hole. The bone screws are available in a variety of diameters and lengths. The interbody plate components are available in a variety of heights. The spacer components are available in a variety of depths, widths, and heights.

INDICATION

The Ceres-C Stand-Alone Cervical System is a stand- alone anterior cervical interbody fusion device indicated for use in skeletally mature patients with degenerative disc disease (DDD) with accompanying radicular symptoms at one level from C2-T1. DDD is defined as discogenic pain with degeneration of the disc confirmed by history and radiographic studies. These patients should have had six weeks of non- operative treatment. The Ceres-C Stand-Alone Cervical implant should be packed with autograft or allogenic bone graft comprised of cancellous and/or corticocancellous bone graft and implanted with an anterior approach.

CONTRAINDICATIONS

1. The Ceres-C Stand-Alone Cervical System is contraindicated in the presence of infection, pregnancy, metabolic disorders of calcified tissues, drug/alcohol abuse, mental illness, general neurologic conditions, immunosuppressive disorders, patients with known sensitivity to materials in the device, obesity and patients who are unwilling to restrict activities or follow medical advice.
2. Biological factors such as smoking, use of nonsteroidal anti-inflammatory agents, the use of anticoagulants, etc. all have a negative effect on bony union. Contraindications may be relative or absolute and must be carefully weighed against the patient's entire evaluation.
3. This device is not intended for use except as indicated.
4. Prior fusion at the level(s) to be treated.

WARNINGS

Implants and instruments are provided non-sterile. Instruments must be cleaned and sterilized before use. Implants may be reprocessed prior to use and must be sterilized before use. Validated sterilization cycle parameter protocols are noted in the sterilization section of this insert. Implants that have come in direct contact with a patient or bio-contaminants should be disposed of.

Some instruments may be sharp, depending on their intended use. Care should be taken in handling such instruments to avoid injury to the user or patient.

A successful result is not always achieved in every surgical case. This fact is especially true in spinal surgery where many extenuating circumstances may compromise the results. System components are temporary implants used for the correction and stabilization of the spine. Devices are intended to be used to augment the development of a spinal fusion by providing temporary stabilization. Devices are not intended to be the sole means of spinal support. Use of these products without a bone graft or in cases that develop into a non-union will not be successful. No spinal implant can withstand body loads without the support of bone. In this event, bending, loosening, disassembly and/or breakage of the device(s) will occur.

Implantation of devices should be performed only by experienced surgeons with training in the use of spinal devices. This is a technically demanding procedure presenting a risk of serious injury to the patient.

Preoperative and operating procedures including knowledge of surgical techniques, proper reduction, and proper selection and placement of the implant are important considerations in the successful utilization of this device by the surgeon. Further, the proper selection and compliance of the patient will greatly affect the results. The physician should consider the levels of implantation, patient weight, patient activity level, and all other patient conditions that may have an impact on the performance of this device. Patients who smoke have been shown to have an increased incidence of non-union. These patients should be advised of this fact and warned of this consequence. Obese, malnourished, and/or alcohol abuse patients are also poor candidates for spine fusion. Patients with poor muscle and bone quality and/or nerve paralysis are also poor candidates for spine fusion.

Patients with previous spinal surgery at the level(s) to be treated may have different clinical outcomes compared to those without a previous surgery.

Physician Note: The physician is the learned intermediary between the company and the patient. The indications, contraindications, warnings, and precautions given in this document must be conveyed to the patient.

MAGNETIC RESONANCE ENVIRONMENT

The Ceres-C Stand Alone device has not been evaluated for safety and compatibility in the MR environment. It has not been tested for heating, migration, or image artifact in the MR environment. The safety of the device in the MR environment is unknown. Scanning a patient who has this device may result in patient injury.

POSSIBLE ADVERSE EVENTS

1. Early or late loosening of any or all of the components.
2. Disassembly, bending, and/or breakage of any or all of the components.
3. Loss of fixation (implant migration).
4. Foreign body (allergic) reaction to implants, debris, corrosion products (from crevice, fretting, and/or general corrosion), including metallosis, staining, tumor formation, and/or autoimmune disease.
5. Postoperative change in spinal curvature, loss of correction, height, and/or reduction.
6. Infection.
7. Dural tears, persistent CSF leakage, meningitis.
8. Loss of neurological function including paralysis (partial or complete), radiculopathy, and/or the development or continuation of pain, numbness, spasms, or sensory loss.
9. Cauda equina syndrome, neurological deficits, paraplegia, reflex deficits, irritation, and/or muscle loss.
10. Loss of bladder control or other types of urological system compromise.
11. Scar formation possibly causing neurological compromise or compression around nerves and/or pain.
12. Fracture, micro-fracture, resorption, damage, or penetration of any spinal bone.
13. Soft tissue injury, vascular, or visceral injury.
14. Herniated nucleus pulposus, disc disruption or degeneration at, above, or below the level of surgery.
15. Non-union (pseudo-arthritis), delayed union, mal-union.
16. Cessation of any potential growth of the operated portion of the spine.
17. Loss of or increase in spinal mobility or function.
18. Inability to perform the activities of daily living.
19. Death.

Additional surgery may be necessary to correct the occurrence of some of these possible adverse events.

PREOPERATIVE MANAGEMENT

1. The surgeon should consider for surgery only those patients indicated for the use of this device.
2. The surgeon should not consider for surgery those patients contraindicated for the use of this device.
3. The surgeon should have a complete understanding of the device's indications, contraindications, and applications.
4. The surgeon should have a complete understanding of the function and limitations of each implant and instrument.
5. Device components should be received and accepted only in packages that have not been damaged or tampered with. Damaged implants and/or instruments should not be used. All implants and instruments should be inspected prior to use. Components must be carefully handled and stored in a manner that prevents scratches, damage, and corrosion.
6. The type of implant to be used for the case should be determined prior to beginning the surgery.
7. All instruments and implants should be processed and sterilized prior to use.

INTRAOPERATIVE MANAGEMENT

1. Caution should be taken in handling the implants. Damage to the implants may affect their performance.
2. Extreme caution should be used around the spinal cord and nerve roots. Damage to the nerves will cause loss of neurological functions.
3. Breakage, slippage, or misuse of instruments or implant components may cause injury to the patient or operative personnel.
4. Implants should be attached to the corresponding inserter such that they are fully seated on the inserter. Care should be taken not to over-tighten the implant to the inserter.
5. Implants should not be axially rotated with the inserter once they have been implanted. This may lead to damage of the implant and/or the inserter.
6. Whenever possible or necessary, an imaging system should be utilized to facilitate surgery.
7. Caution should be taken not to over-tighten threaded components, including instruments, implants, and interfaces between implants and instruments.
8. To assure proper fusion below and around the location of the fusion, autogenous bone graft should be used.
9. Implants should not be reused (used in additional patients) under any circumstances.

POSTOPERATIVE MANAGEMENT

Postoperative management by the surgeon, including instruction and warning to and compliance by the patient, of the following is essential:

1. The patient should have a complete understanding of and compliance with the purpose and limitations of the implant devices.
2. Postoperative patients should be instructed to limit activity as determined by their surgeon.
3. Retrieved implants should be properly disposed of and are not to be reused under any circumstances.

SINGLE USE

Reuse of a single use device that has come in contact with blood, bone, tissue or other body fluids may lead to patient or user injury. Possible risks associated with reuse of a single use device include, but are not limited to, mechanical failure, serious injury, transmission of infectious agents and death.

CLEANING AND MAINTENANCE

GENERAL INFORMATION

Spinal Elements' instruments are manufactured from various stainless steels, aluminums, and polymers. All materials used have a history of use in such instruments.

CLEANING AND MAINTENANCE

Devices must be free of packaging material prior to sterilization. Cleaning, maintenance and mechanical inspection must be performed by hospital personnel trained in the general procedures involving contaminant removal. Only neutral pH cleaners or detergents labeled for use in cleaning medical devices should be used for cleaning components. Only lubricants that are intended for use on surgical instruments should be used to lubricate instruments. Follow directions from the manufacturer of lubricating and cleaning agents regarding handling, concentration, and use of such agents.

Cleaning instructions are provided in accordance with recognized standards and regulations and are intended to supplement a hospital's existing device cleaning and disinfecting protocol. Contaminated devices should be wiped clean of visible soil at the point of use prior to transfer to a central processing unit for cleaning and sterilization. Contaminated devices must be cleaned promptly after use per the instructions provided in this insert to minimize drying and ensure an effective cleaning.

AUTOMATED CLEANING INSTRUCTIONS

All devices must be processed manually prior to automated cleaning. Follow the instructions below for the manual and automated washing.

PRE-AUTOMATED WASHER: MANUAL CLEANING

1. Disassemble all instruments that come apart for cleaning.
2. Rinse under running tap water to remove gross contamination. Use a syringe, wire guide and/or pipe cleaner (as appropriate to the presented cleaning challenge) to push debris out of lumens/cannulations or other hard to reach areas. Pay special attention to lumens of the external shafts of disassembled instruments.

3. Prepare Enzol® (or equivalent neutral or mild pH enzymatic cleaner) according to manufacturer recommendations using warm tap water. Fully immerse devices in the enzymatic cleaner solution and allow to soak for a minimum of one (1) minute. While soaking, actuate the instruments through a full range of motion (as appropriate) to allow complete penetration of the cleaning solution. Instruments that do not disassemble may require additional soaking.
4. After the soak, remove the instruments and wipe any soil or debris using a disposable towel. Then, place the instruments into a fresh batch of enzymatic cleaning solution using warm water. Scrub the entire surface of the devices with a soft bristle brush paying particular attention to hard to reach areas such as mated surfaces. A syringe, wire guide, and/or pipe cleaner should be used to aid in cleaning lumens/cannulations or other hard to reach areas. A minimum of 60ml of detergent should be used when flushing lumens and cannulations. Ensure no soil is visible in the rinse stream.
5. Remove from enzymatic cleaner solution and rinse with reverse osmosis or de-ionized (RO/DI) water for a minimum of 30 seconds to remove any residual cleaner solution. Thoroughly and aggressively flush lumens, holes and other hard to reach areas with a minimum of 60ml of water.
6. Prepare Prolystica® (or equivalent neutral pH detergent) according to manufacturer recommendations using warm tap water in an ultrasonic bath. Fully immerse into the sonication bath and sonicate for a minimum of 10 minutes.
7. Remove from the detergent solution and rinse by agitating and actuating in RO/DI water for a minimum of 30 seconds to remove any residual detergent and until no sign of soil is seen in the rinse stream. While rinsing, thoroughly and aggressively flush lumens, holes and other hard to reach areas with a minimum of 60ml of water.

AUTOMATED CLEANING

8. Transfer the instruments into the washer for processing. Position the instruments to allow for proper drainage. Process per the cycle below. These are minimum validated parameters:

Phase	Recirculation Time	Water Temp	Detergent Type (if applicable)
Pre-wash	2 minutes	Cold tap water	N/A
Enzyme Wash	2 minutes	Hot tap water	Enzol or equivalent per manufacturer's instructions
Wash	2 minutes	65.5°C	Prolystica or equivalent per manufacturer's instructions
PURW Rinse	2 minutes	43°C	N/A
Drying	15 minutes	90°C	N/A

9. If needed, dry devices using a clean lint-free cloth. Pressurized air (20psi) may be used to assist in drying.
10. Visually examine devices to ensure all visible soil has been removed.
11. Once instruments pass visual inspection, reassemble devices that come apart for cleaning.
12. After cleaning, an instrument lubricant (i.e., Steris Hinge-Free® or equivalent) should be applied to moving devices to maintain fluid movement between components. Pay special attention to the instruments called out in system specific sections.

MANUAL CLEANING INSTRUCTIONS

Follow the instructions listed below for manual cleaning prior to sterilization.

1. Disassemble all instruments that come apart for cleaning. Ensure that the jeweler handle AO connection is removed from any drill or driver that it is connected to, and that the graft loader blocks are separated. Please put these instruments in their dedicated locations in the sterilization trays after cleaning.
2. Rinse under running tap water to remove gross contamination. Use a syringe, wire guide, and/or pipe cleaner (as appropriate to the presented cleaning challenge) to push debris out of lumens/cannulations or other hard to reach areas. Pay special attention to the lumens of the external shafts of disassembled instruments.
3. Prepare Enzol® (or equivalent neutral pH enzymatic cleaner) according to manufacturer recommendations using warm tap water. Fully immerse devices in the enzymatic cleaner solution and allow to soak for a minimum of 20 minutes. After the soak, scrub devices with a soft bristle brush paying particular attention to hard to reach areas such as mated surfaces. A syringe, wire guide, and/or pipe cleaner should be used to aid in cleaning lumens/cannulations or other hard to reach areas. A minimum of 60ml of detergent should be used when flushing lumens and cannulations.
4. Remove from enzymatic cleaner solution and rinse with reverse osmosis/de-ionized (RO/DI) water for a

- minimum of 3 minutes to remove any residual cleaner solution. Thoroughly and aggressively flush lumens, holes and other hard to reach areas with a minimum of 60ml of water.
5. Prepare Prolystica® (or equivalent neutral pH detergent) according to manufacturer recommendations using warm tap water in an ultrasonic bath. Fully immerse into the sonication bath and sonicate for a minimum of 10 minutes.
 6. Remove from the detergent solution and rinse with RO/DI water for a minimum of 3 minutes to remove any residual detergent and until no sign of soil is seen in the rinse stream. Thoroughly and aggressively flush lumens, holes and other hard to reach areas with a minimum of 60ml of water.
 7. Repeat Steps 5 and 6.
 8. Dry devices using a clean lint-free cloth. Pressurized air (20psi) may be used to assist in drying.
 9. Visually examine devices to ensure all visible soil has been removed.
 10. Once instruments pass visual inspection, reassemble devices that come apart for cleaning.
 11. After cleaning, an instrument lubricant (i.e., Steris Hinge-Free® or equivalent) should be applied to moving devices to maintain fluid movement between components. All instruments with hinged or ratcheting mechanisms should be lubricated.









STERILIZATION

Implants and instruments are provided non-sterile and must be sterilized before use. Non-sterile implants and instruments should be autoclave sterilized using one of the following validated cycle parameters.

	Method	Cycle Type	Sterilization Temperature	Exposure Time	Dry Time
Wrapped	Steam	Gravity Displacement	250°F (121°C)	30 minutes	30 minutes
	Steam	Pre-vacuum	270°F (132°C)	4 minutes	30 minutes

Sterilization parameters were validated per *ANSI/AAMI/ISO 17665-1: 2006. Sterilization of Health Care Products – Moist Heat – Part 1 Requirements for the Development, Validation, and Routine Control of a Sterilization Process for Medical Devices and ANSI-AAMI ST79 - Comprehensive guide to steam sterilization and sterility assurance in health care facilities*. These parameters were validated to a sterility assurance level (SAL) of 10⁻⁶. These sterilization cycles are not considered by the Food and Drug Administration to be standard sterilization cycles. It is the end user's responsibility to use only sterilizers and accessories (such as sterilization wraps, sterilization pouches, chemical indicators, biological indicators, and sterilization cassettes) that have been cleared by the Food and Drug Administration for the selected sterilization cycle specifications (time and temperature).

INFORMATION

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| <p> Catalog Number</p> <p> Batch Code</p> <p> Manufacturer</p> <p> Caution, Consult Accompanying Documents</p> | <p> Material</p> <p> Packaged Quantity</p> <p> Date of Manufacture</p> <p> Do Not Re-Use</p> |
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 Device Not Sterile

 Prescription Only

 Instruction for Use are provided electronically at ifu.spinalelements.com

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Patent: patent.spinalelements.com

For additional information regarding any of Spinal Elements' devices, please contact Spinal Elements, Inc. Customer Service at (760) 607-0121.

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