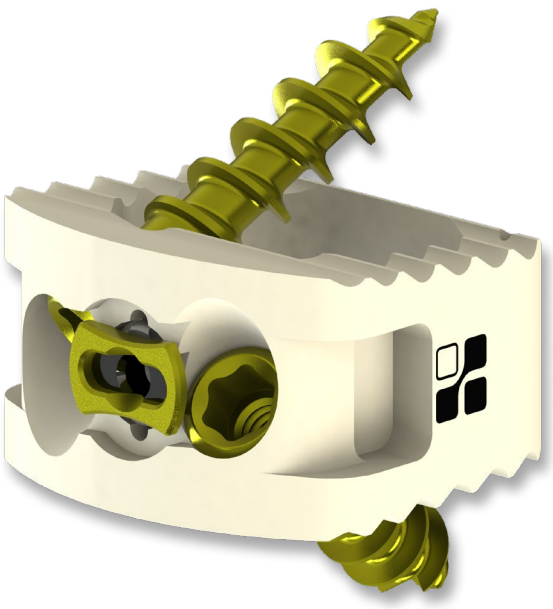
NEURO® STRUCTURES



Cavetto®-SA

STAND ALONE CERVICAL CAGE

SURGICAL TECHNIQUE GUIDE

As described by

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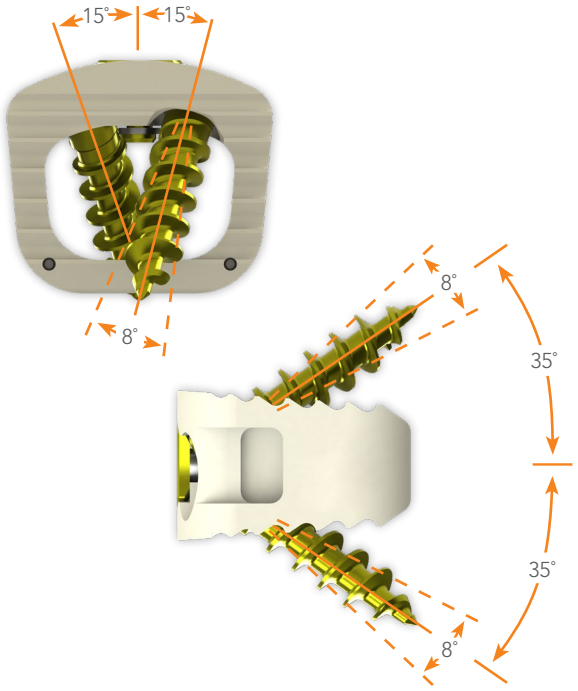
Cavetto®-SA

This is intended as a guide only. There are multiple techniques for the delivery of Cervical Cages as with any surgical procedure. A surgeon should be thoroughly trained before proceeding. Each surgeon must consider the particular needs of each patient and make the appropriate adjustments when necessary and as required. Please refer to the instructions for use insert for complete system description, indications, and warning.



Cage Sizes

		Depth (mm) x Width (mm)		
		12 x 14	14 x 16	16 x 18
Height (mm)	6	✓	✓	✓
	7	✓	✓	✓
	8	✓	✓	✓
	9	✓	✓	✓
	10	✓	✓	✓

** The Cavetto-SA Cervical Cage is offered in non-lordotic, anatomic, and 8° lordotic styles.*

Screws


Variable – *gold*
3.5mm self-drilling


Variable – *gold band*
4.0mm self-drilling


Fixed – *light blue*
3.5mm self-drilling


Fixed – *light blue band*
4.0mm self-drilling


Variable – *light green*
3.5mm self-tapping


Variable – *light green band*
4.0mm self-tapping


Fixed – *light magenta*
3.5mm self-tapping


Fixed – *light magenta band*
4.0mm self-tapping


Self-drilling


Self-tapping

Fixed & Variable Screw Size

		Ø (mm)	Length (mm)				
Self-Drilling	Variable	3.5	10	12	14	16	18
		4.0	10	12	14	16	18
	Fixed	3.5	10	12	14	16	18
		4.0	10	12	14	16	18
Self-Tapping	Variable	3.5	10	12	14	16	18
		4.0	10	12	14	16	18
	Fixed	3.5	10	12	14	16	18
		4.0	10	12	14	16	18

Trial

It is recommended that preoperative planning be used to help determine the proper entry point and trajectory. Identify the operative levels using A/P and lateral fluoroscopy.

Trials can be used to determine the appropriate implant size *(Figure 1 & 2)*.

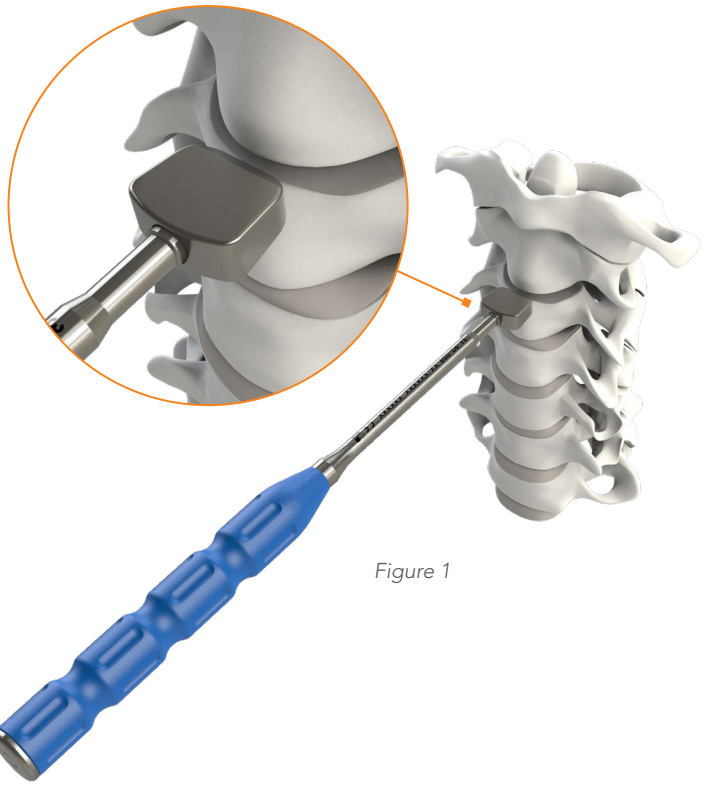


Figure 1

Trial

Figure 2

Rasp

Rasps can be used to prepare the site and determine the appropriate implant size *(Figure 3 & 4)*.

Rasp

Figure 3

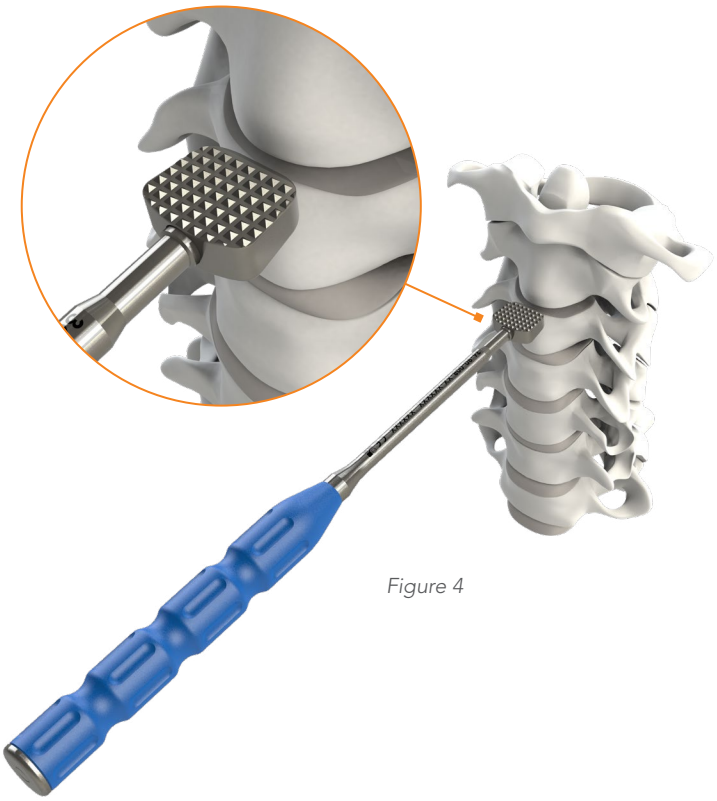


Figure 4

Standard Inserter

Select implant based on Trial/Rasp fit.

The Standard Inserter comes in two variations, one with a stop and one without the stop. Select the appropriate implant inserter size. When using either Standard Inserter, connect the implant by using the two side tabs on the Standard Inserter.

Insert the implant and Standard Inserter into the Inserter Handle. Once the Standard Inserter is fully seated into the Inserter Handle, rotate the knob on the end of the Inserter Handle clockwise to lock the Inserter Handle onto the Standard Inserter *(Figure 5 & 6)*.

Option 1

Inserter With Stop

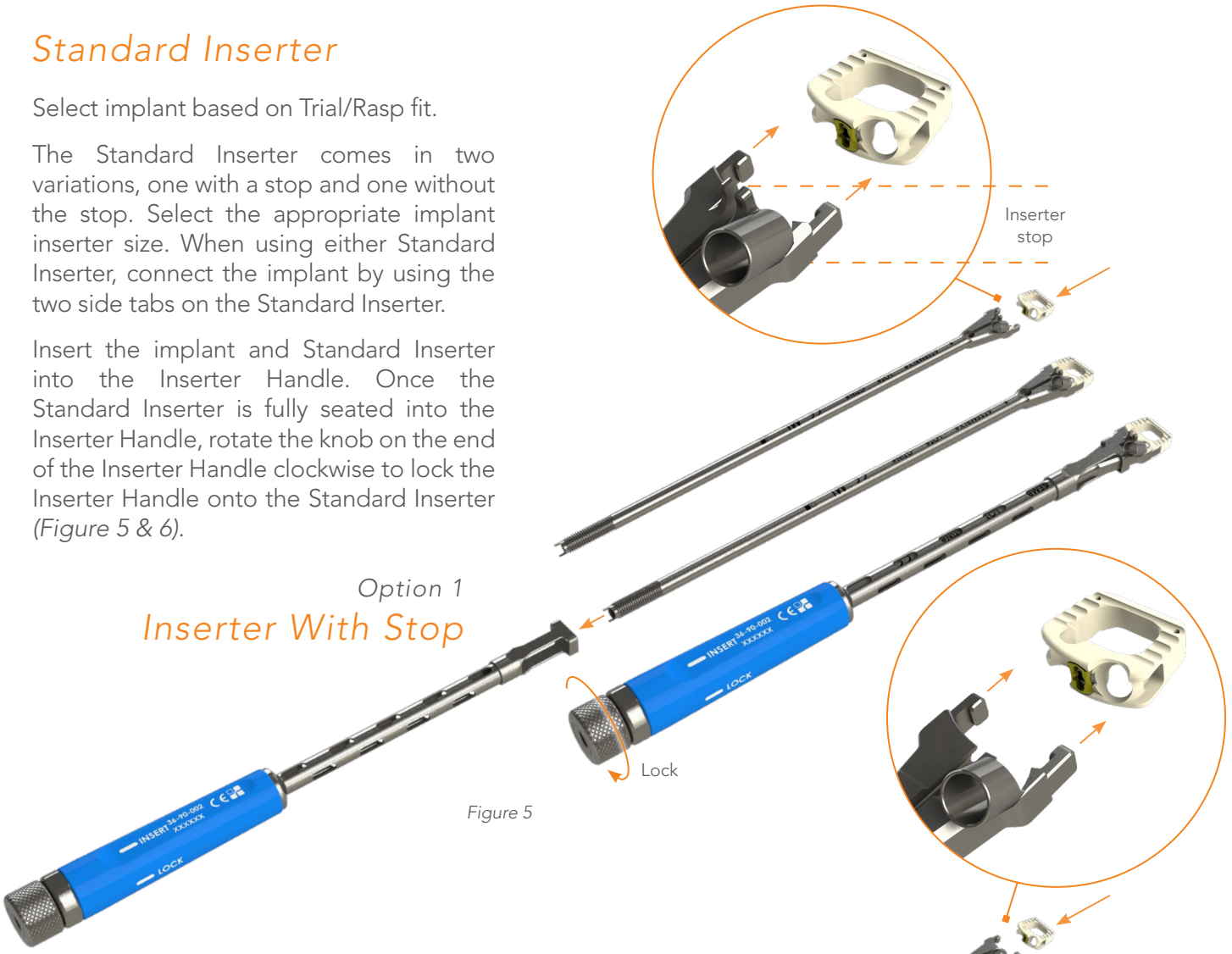


Figure 5

Option 2

Inserter Without Stop

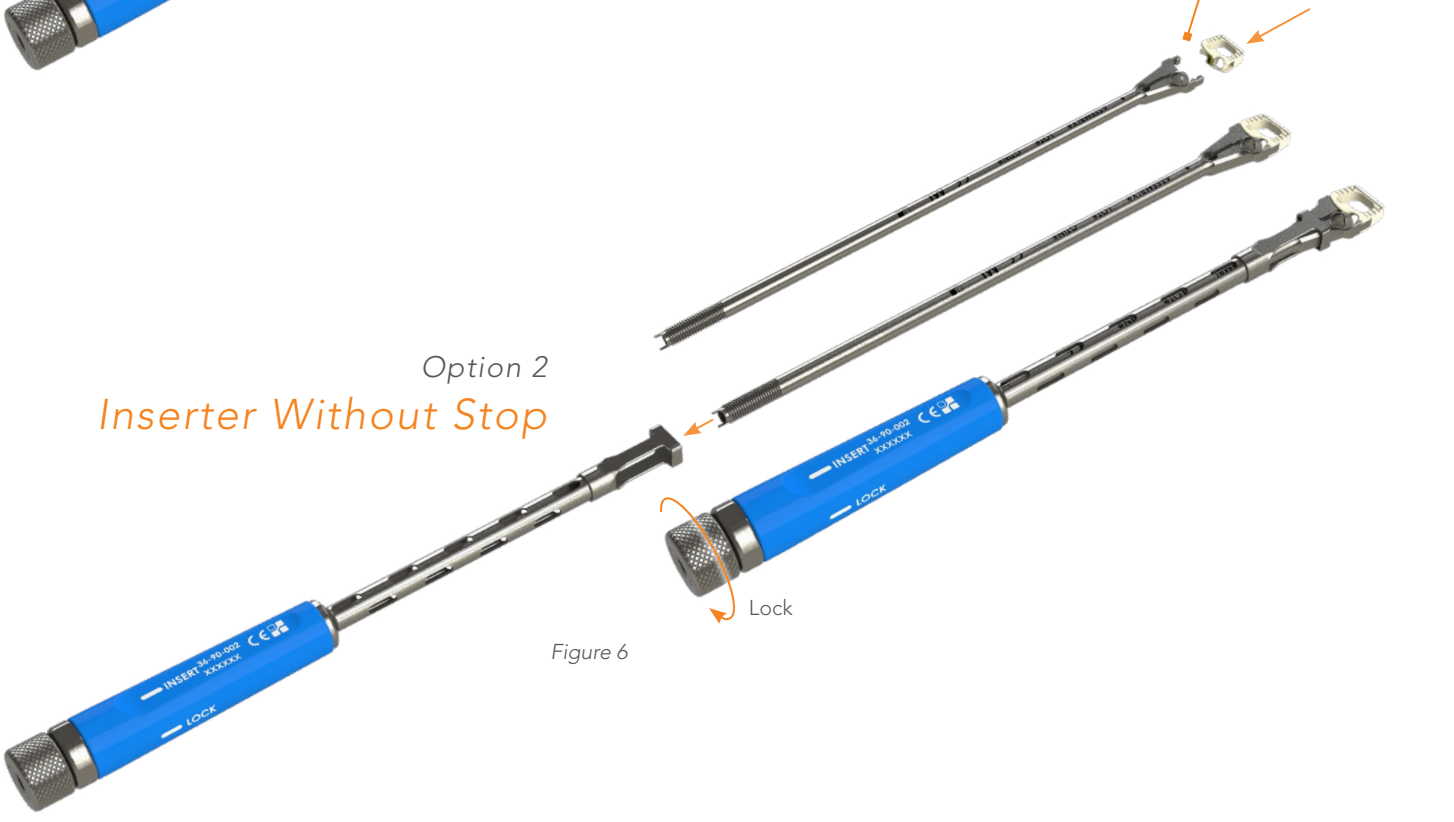


Figure 6

Simple Inserter

Select implant and the appropriate implant inserter based on Trial/Rasp fit.

The Cavetto-SA set also includes a Simple Inserter option. Connect the cage by inserting the two pins directly into the screw holes on the front of the implant.

Then insert the implant and Simple Inserter into the Inserter Handle. Once the Simple Inserter is fully seated into the Inserter Handle, rotate the knob on the end of the Inserter Handle clockwise to lock the Inserter Handle onto the Simple Inserter *(Figure 7)*.

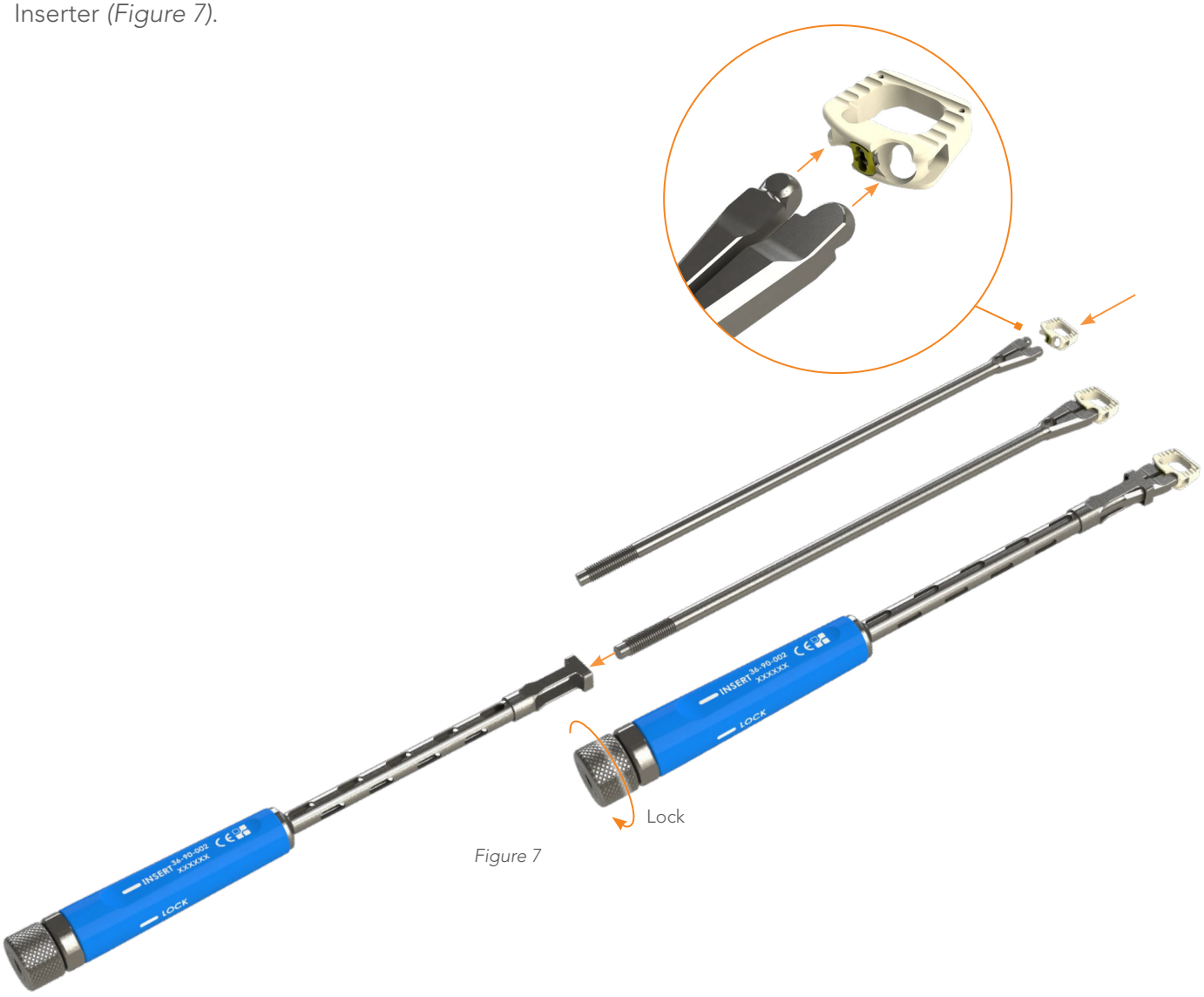


Figure 7

Standard Inserter

Insert the implant into the disc space *(Figure 9)*.

Once the implant has been inserted to the desired position, screw hole preparation and insertion will all be done through the guides *(Figure 10)*.

Caution: Confirm implant placement under fluoroscopy.

Note: If bone grafting material is needed, use the Packing Block and Packing Block Tamp to prepare the implant. Once the implant is loaded onto the inserter of choice, place it into the Packing Block. Then use the Tamp to pack it with bone graft prior to insertion.

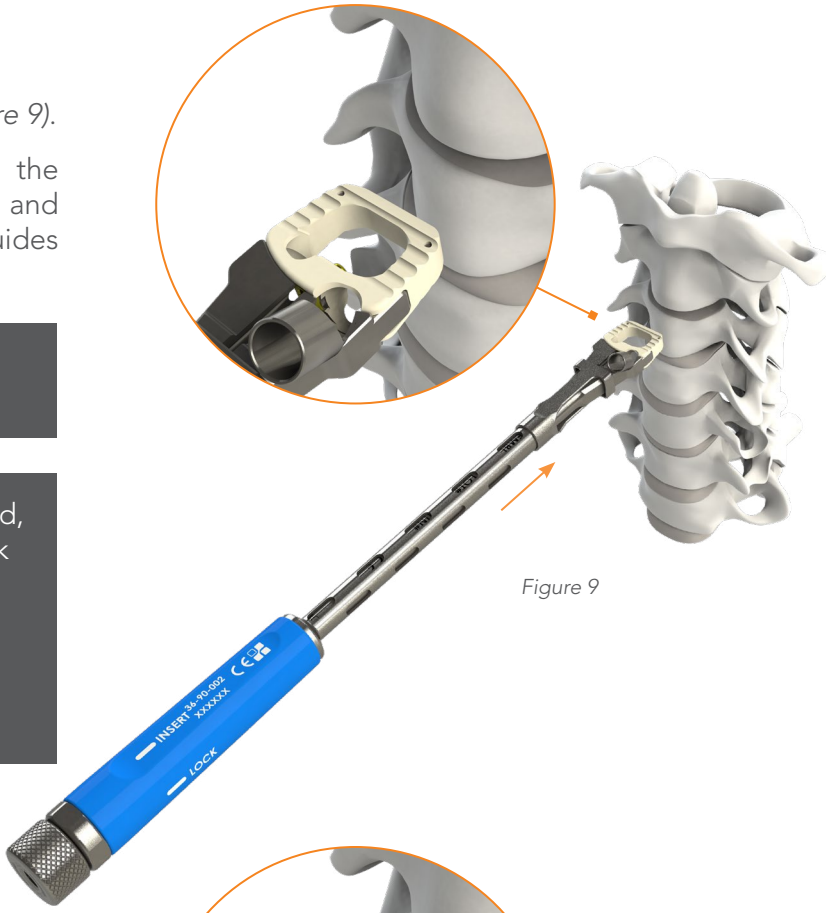


Figure 9

Use the Packing Block and Packing Block Tamp to pack the implant with bone graft prior to insertion *(Figure 8)*.

Figure 8

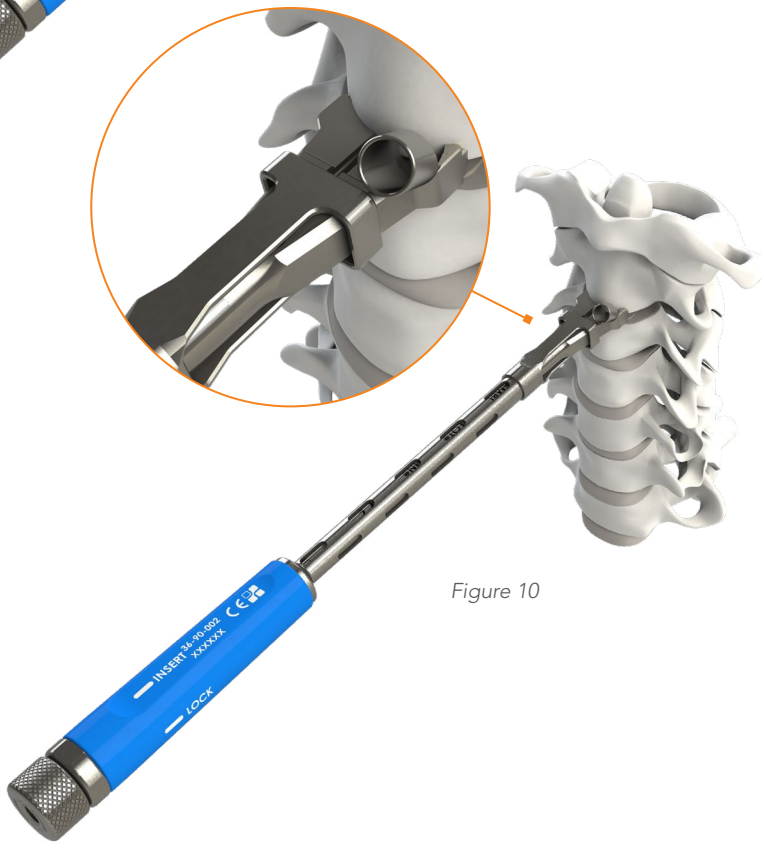


Figure 10

Simple Inserter

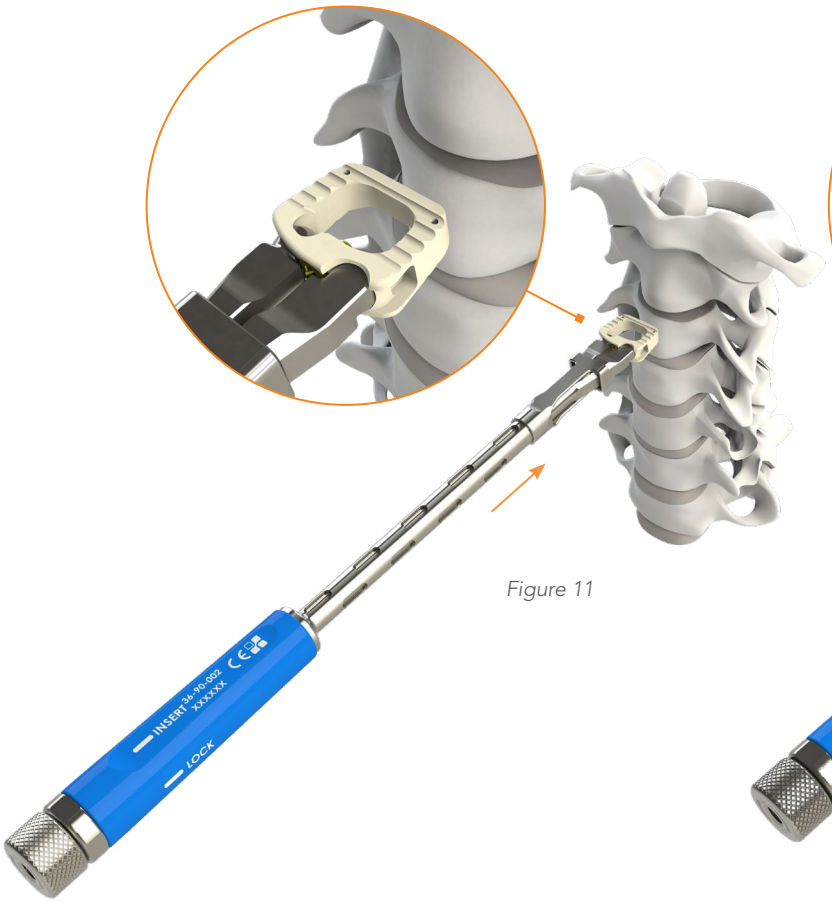


Figure 11

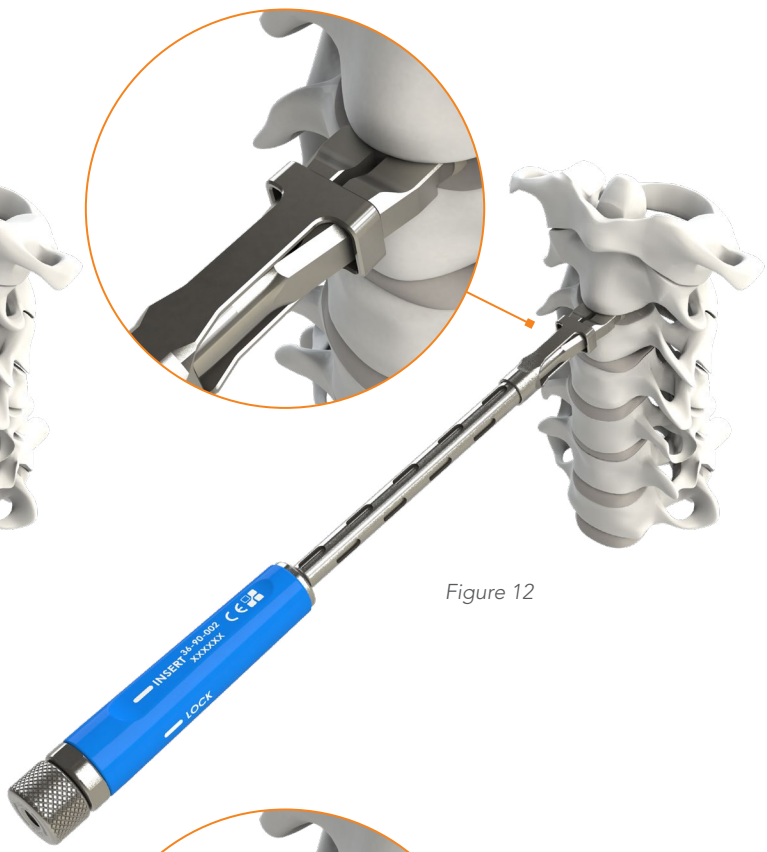


Figure 12

Insert the implant into the disc space *(Figure 11 & 12)*.

When the implant is in the desired position, rotate the knob on the Inserter Handle counter-clockwise to release Inserter Handle from Simple Inserter *(Figure 13)*.

Once the grip on the implant has loosened, both the Simple Inserter and Inserter Handle can be removed together *(Figure 13)*.

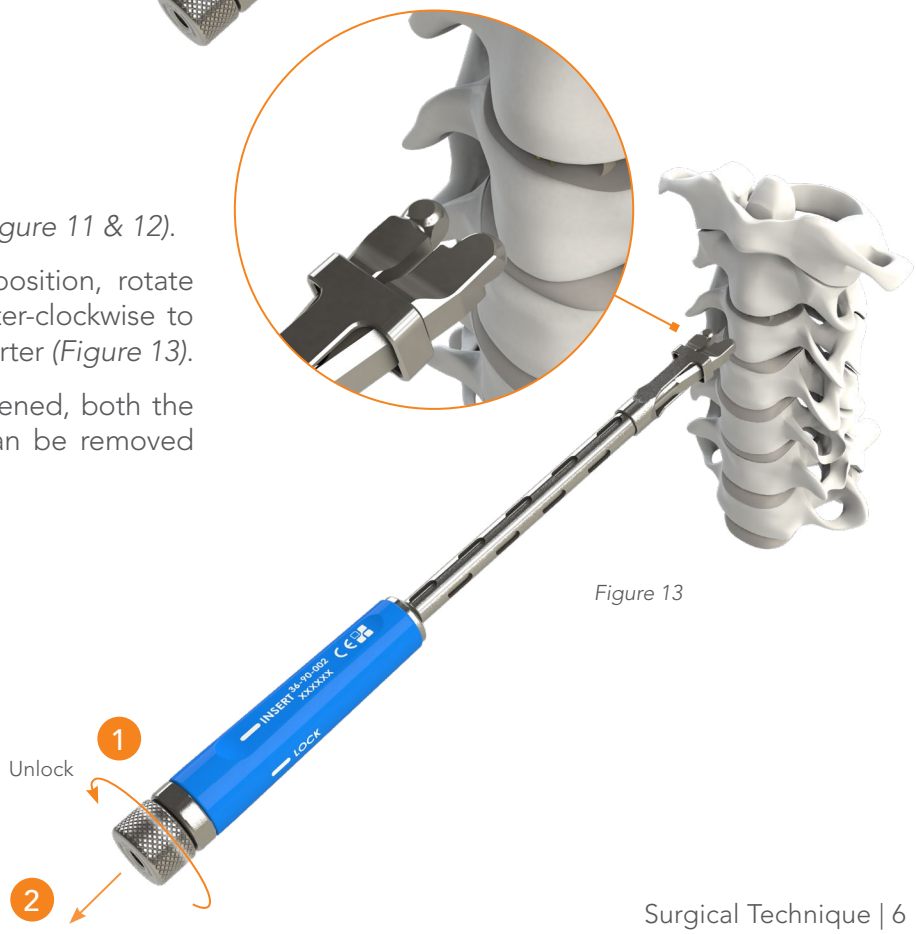


Figure 13

4 Implant Positioning (Optional)

Standard Inserter

This is an OPTIONAL step, to be used only if needed.

If the implant needs to be repositioned, the Implant Pusher may be used.

When using the Implant Pusher, the Standard Inserter must first be removed. To release the implant from the Standard Inserter, first rotate knob on Inserter Handle counter-clockwise to release Inserter Handle from the Standard Inserter *(Figure 15)*.

Once the grip on implant has loosened, both the Standard Inserter and Inserter Handle can be removed together.

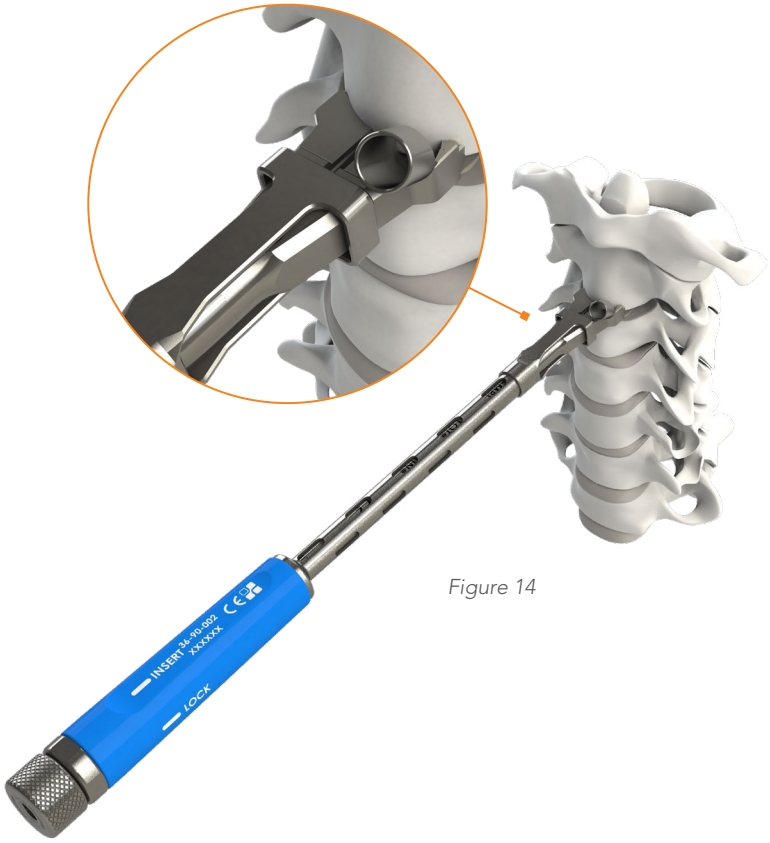


Figure 14

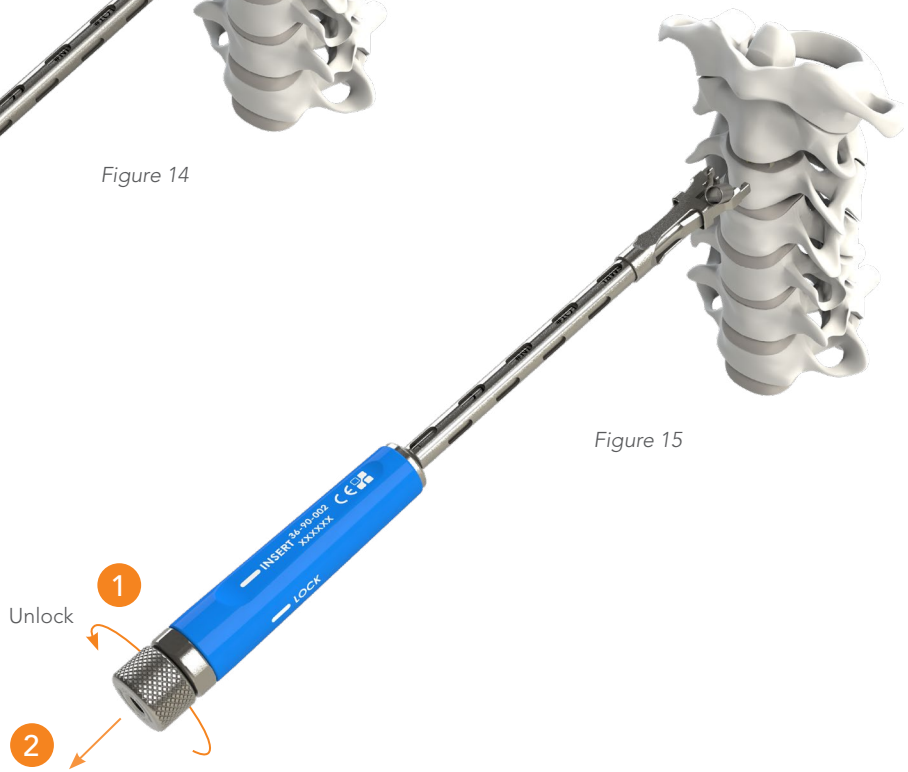


Figure 15

Connect the Implant Pusher to the implant by inserting the two pins into the screw hole on the front of the implant. Once attached, you may move the implant to the desired position *(Figure 17)*.

When the implant has been positioned in the desired location, remove the Implant Pusher by pulling straight out.

Once the Implant Pusher has been removed, reconnect the Standard Inserter or use the Simple Inserter moving forward.

Caution: Confirm implant placement under fluoroscopy.

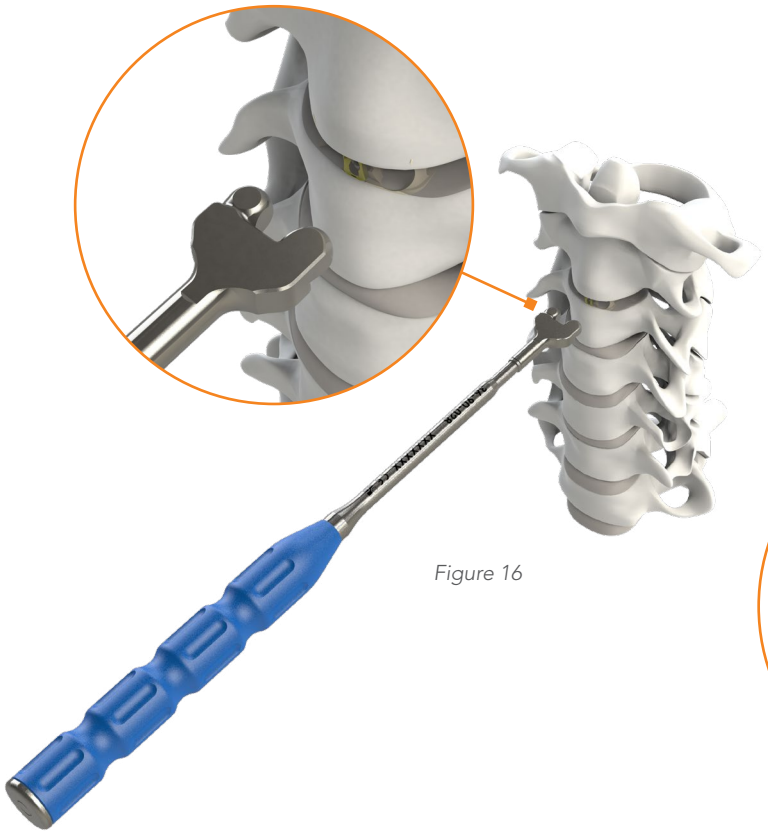


Figure 16

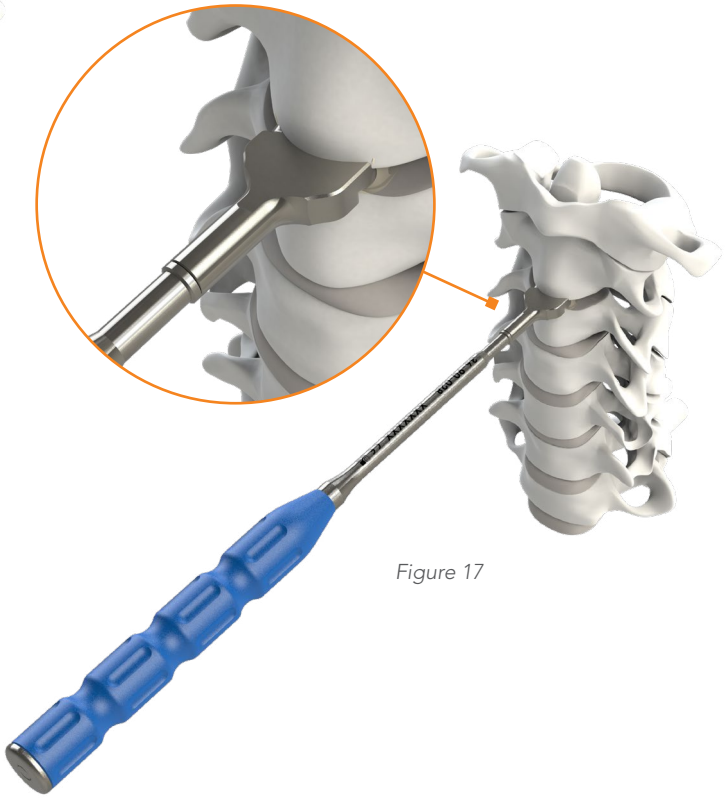


Figure 17

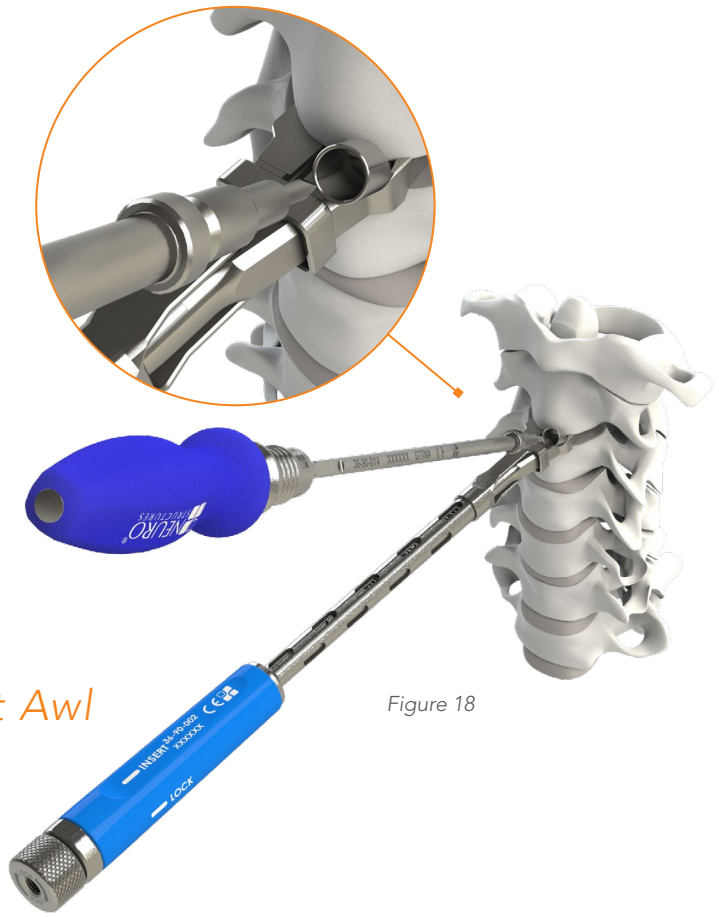
Cavetto-SA Radio Opaque Imaging

5 Screw Hole Preparation

Standard Inserter

The bone screws are self-drilling and/or self-tapping; however, creation of pilot holes is optional and recommended.

The Cavetto-SA system may also come with a Straight Awl, Straight Drill, Straight Tap, Flexible Awl, Flexible Drill, Flexible Tap, Angulating Awl, Straight Spring Loaded Awl, Flexible Spring Loaded Awl, or Angulating Spring Loaded Awl. These will aid in the insertion and preparation of screw holes while minimizing the size of the exposure site of the patient *(Figure 18 & 19)*.



Straight Awl

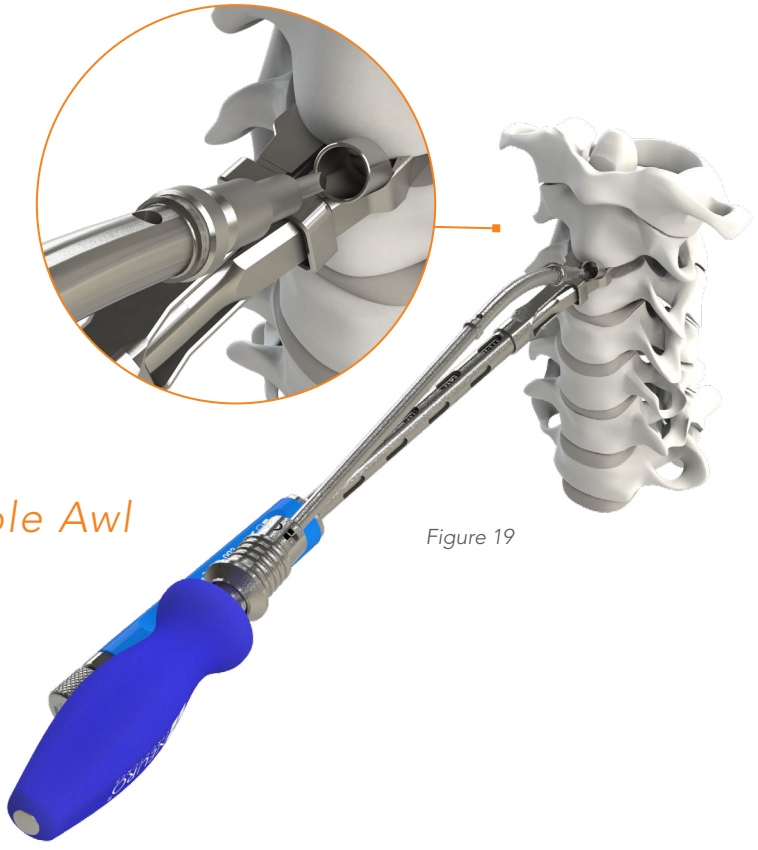
Figure 18

Insert the awl variation of your choice completely through the guide on the Standard Inserter. Once inserted, lightly tap through the cortical surface to create a pilot hole.

The awl depth is up to 8mm, depending on the height of the spacer.

Remove the awl by pulling straight out.

It is recommended to insert the first screw before preparing any other holes if no tapping or drilling is required.



Flexible Awl

Figure 19

Standard Inserter

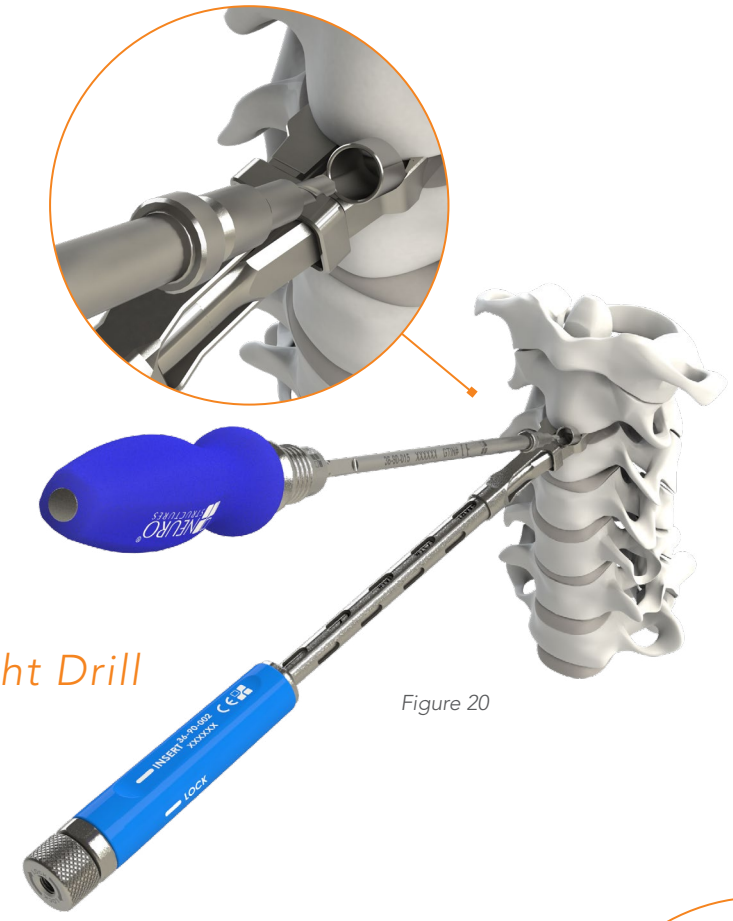


Figure 20

Insert the drill variation of your choice completely through the guide on the Standard Inserter *(Figure 20 & 21)*. Apply pressure on the handle of the drill with rotational motion.

The drill depth is up to 8mm, depending on the height of the spacer.

Remove the drill by pulling straight out. It is recommended to insert the first screw before preparing any other holes if no tapping is required.

Straight Drill

Note: The surgeon must take great care to properly position bone screw holes when using the awl, drill, or tap. Excessively converging hole patterns prohibit proper seating of the bone screws.

Caution: Verify instrument trajectory and placement with fluoroscopy.

Flexible Drill

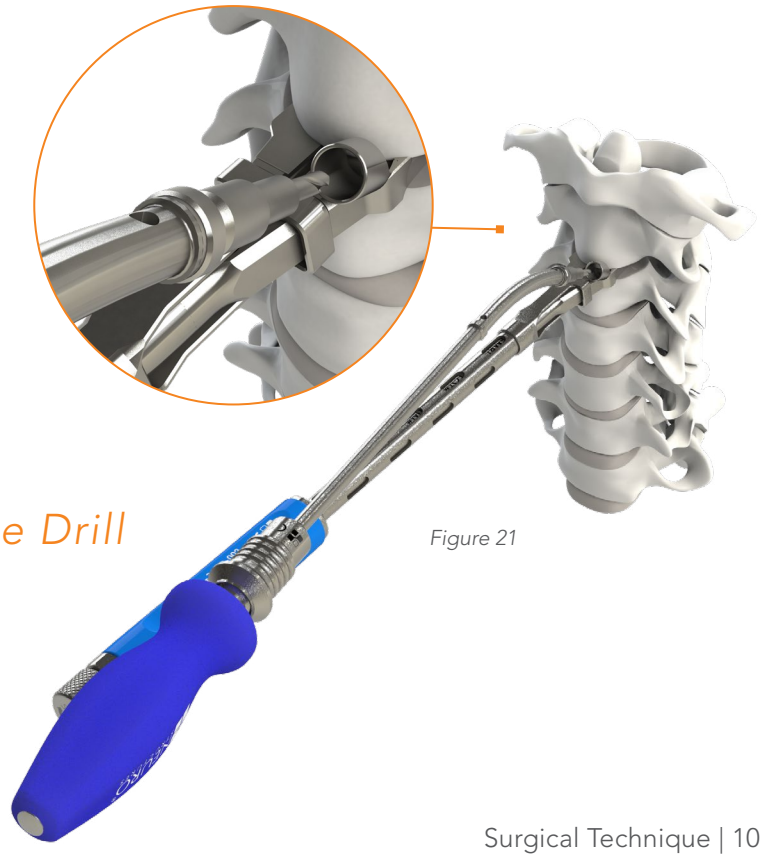


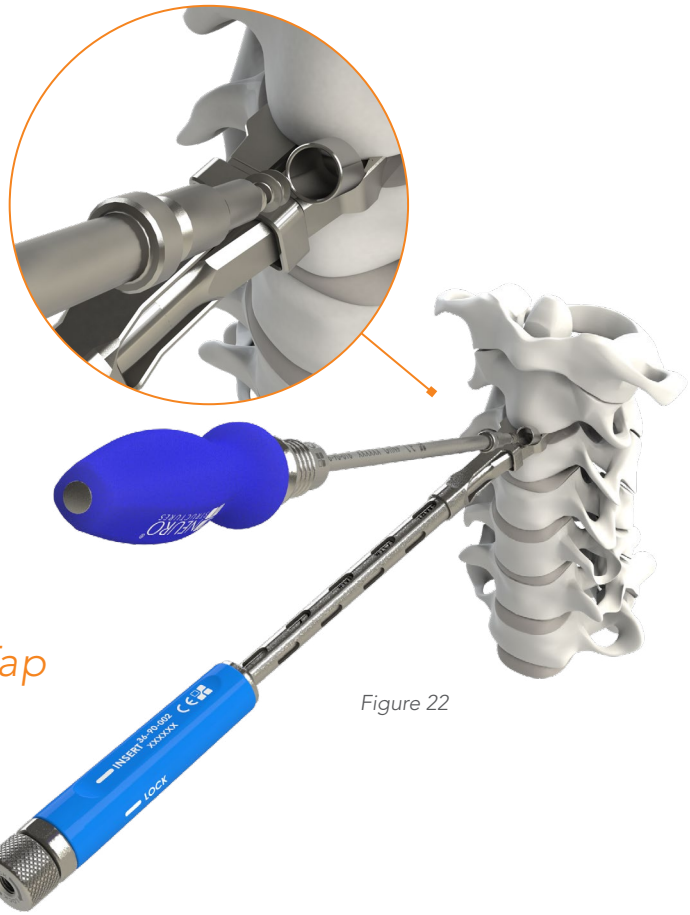
Figure 21

Standard Inserter

Insert the tap variation of your choice completely through the guide on the Standard Inserter *(Figure 22 & 23)*. Apply pressure on the handle of the tap with rotational motion.

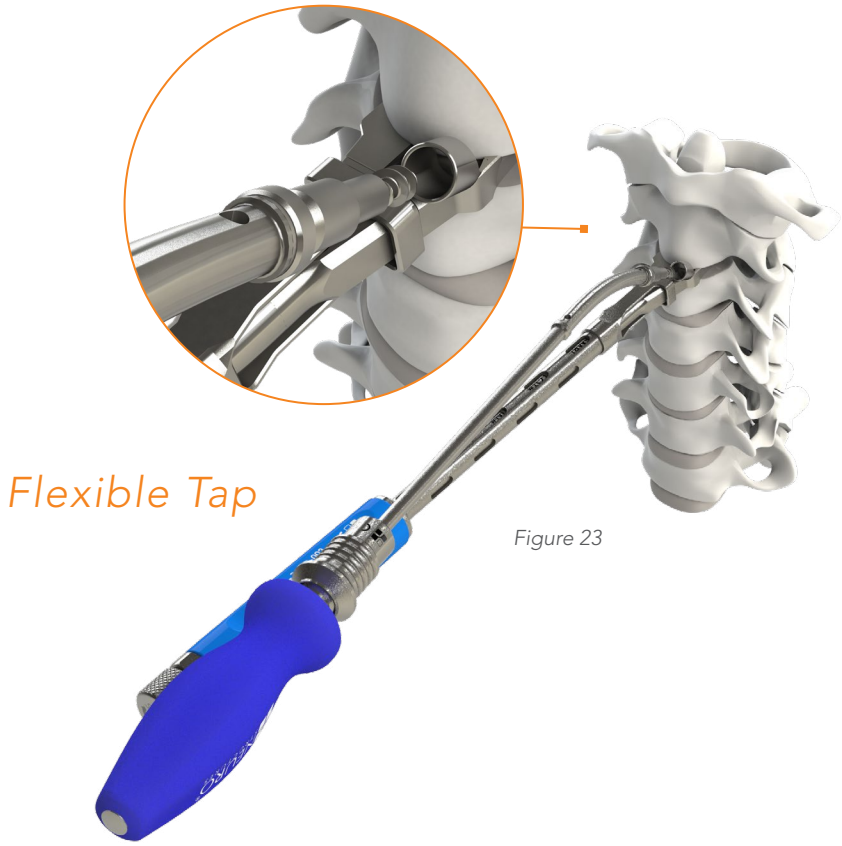
The tap depth is up to 8mm, depending on the height of the spacer.

Remove the tap by pulling straight out. It is recommended to insert the first screw before preparing any other holes.



Straight Tap

Figure 22



Flexible Tap

Figure 23

Single Guide Tube

The bone screws are self-drilling or self-tapping; however, creation of pilot holes is optional and recommended.

Attach the Single Guide Tube to the implant by inserting it into the screw hole *(Figure 24)*.

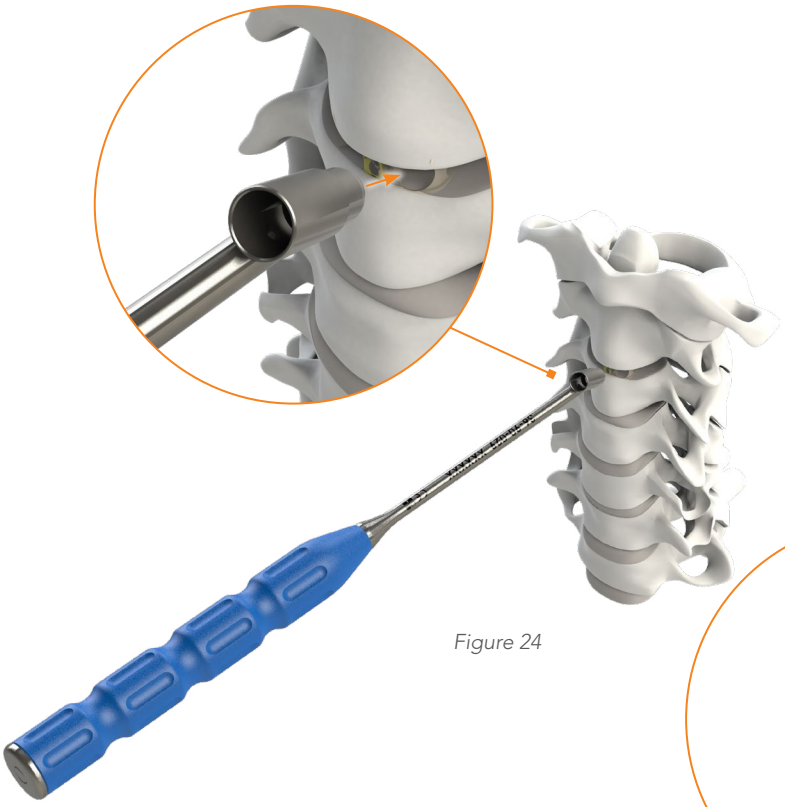


Figure 24

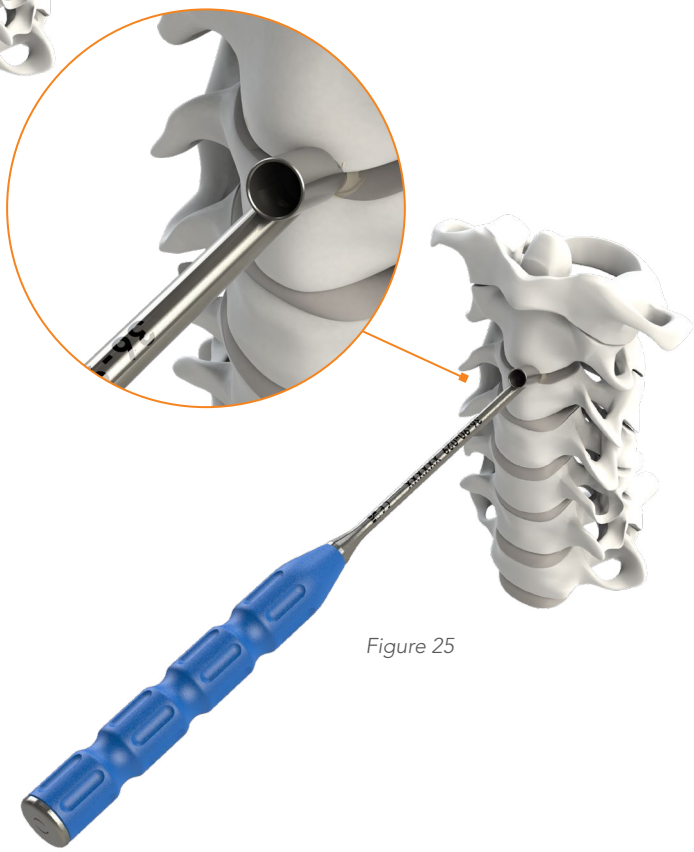


Figure 25

Note: The surgeon must take great care to properly position bone screw holes when using the awl, drill, or tap. Excessively converging hole patterns prohibit proper seating of the bone screws.

Caution: Verify instrument trajectory and placement with fluoroscopy.

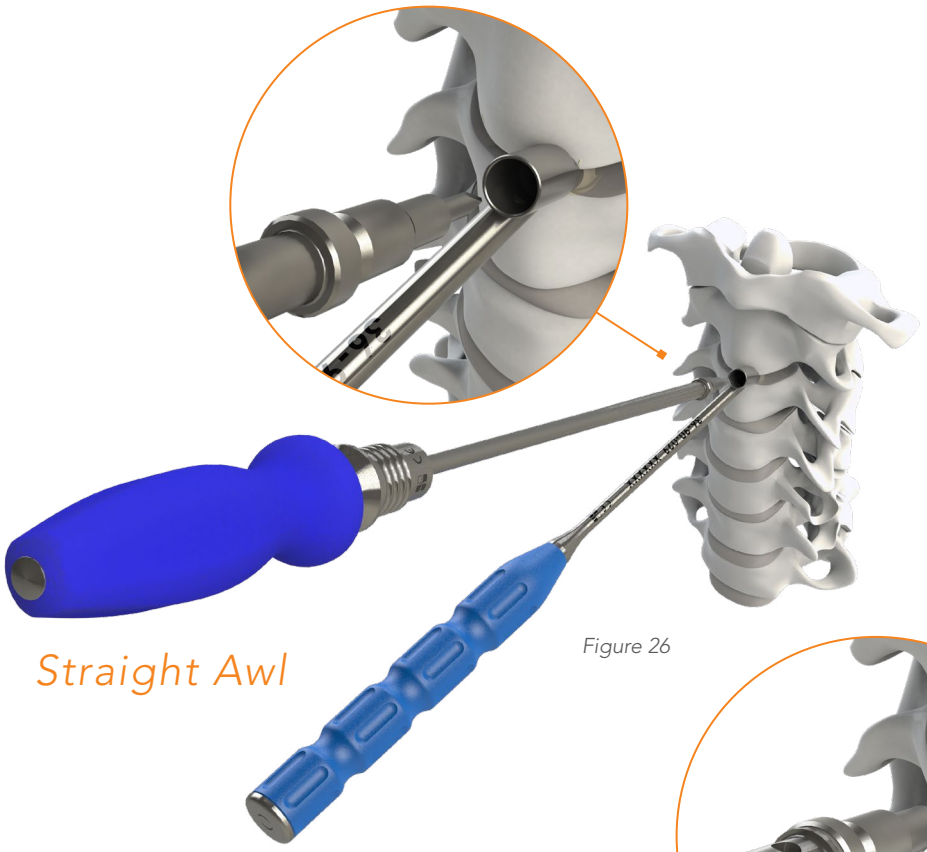
Single Guide Tube

Insert the awl variation of your choice completely through the Single Guide Tube *(Figure 26 & 27)*. Once inserted, lightly tap through the cortical surface to create a pilot hole.

The awl depth is up to 8mm, depending on the height of the spacer.

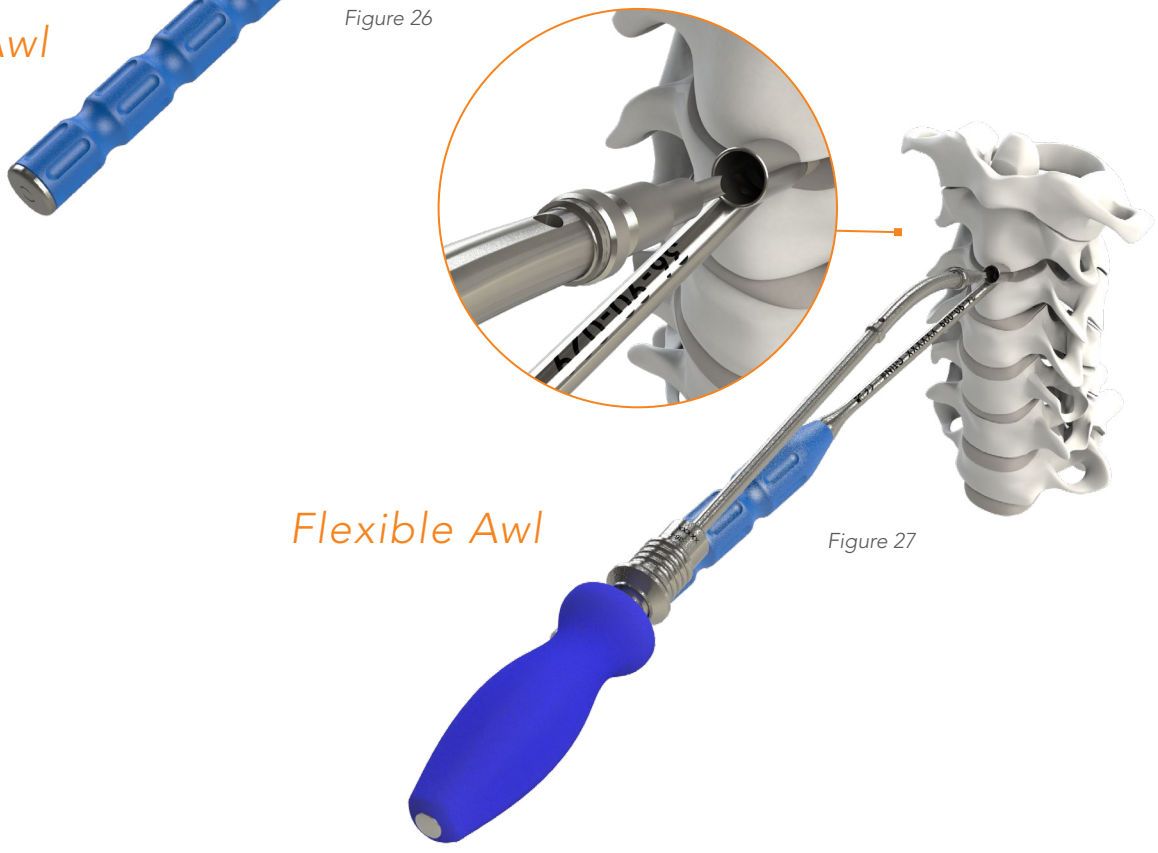
Remove the awl by pulling straight out.

It is recommended to insert the first screw before preparing any other holes if no tapping or drilling is required.



Straight Awl

Figure 26



Flexible Awl

Figure 27

Single Guide Tube

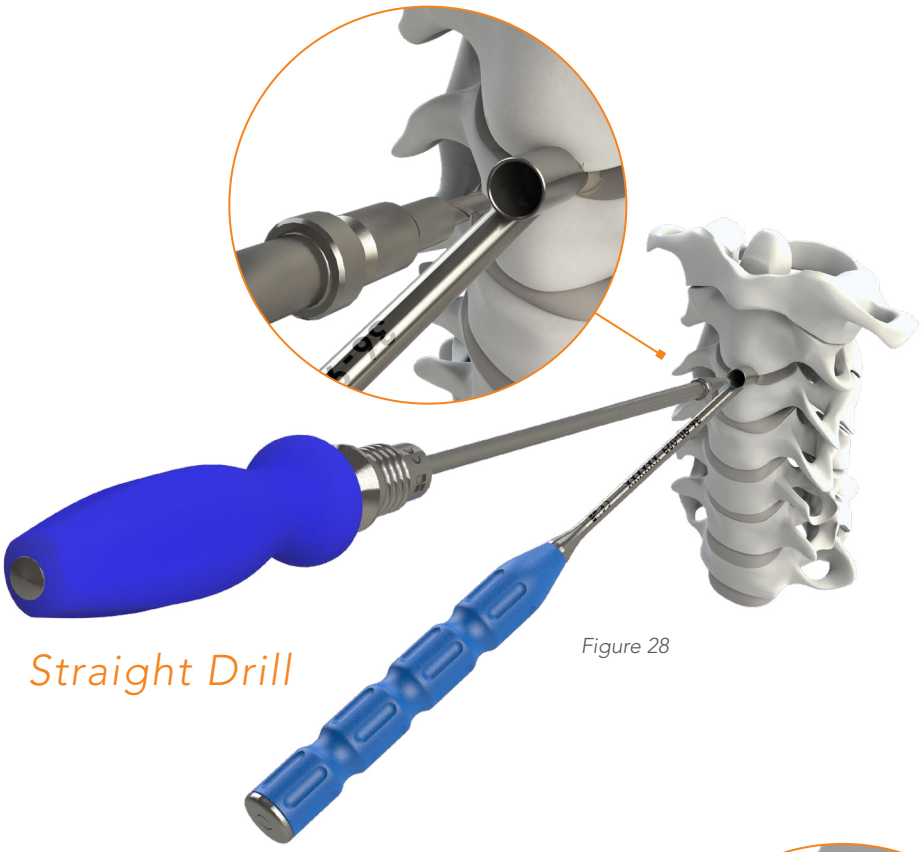


Figure 28

Straight Drill

Insert the drill variation of your choice completely through the Single Guide Tube *(Figure 28 & 29)*. Apply pressure on the handle of the drill with rotational motion.

The drill depth is up to 8mm, depending on the height of the spacer.

Remove the drill by pulling straight out. It is recommended to insert the first screw before preparing any other holes if no tapping is required.

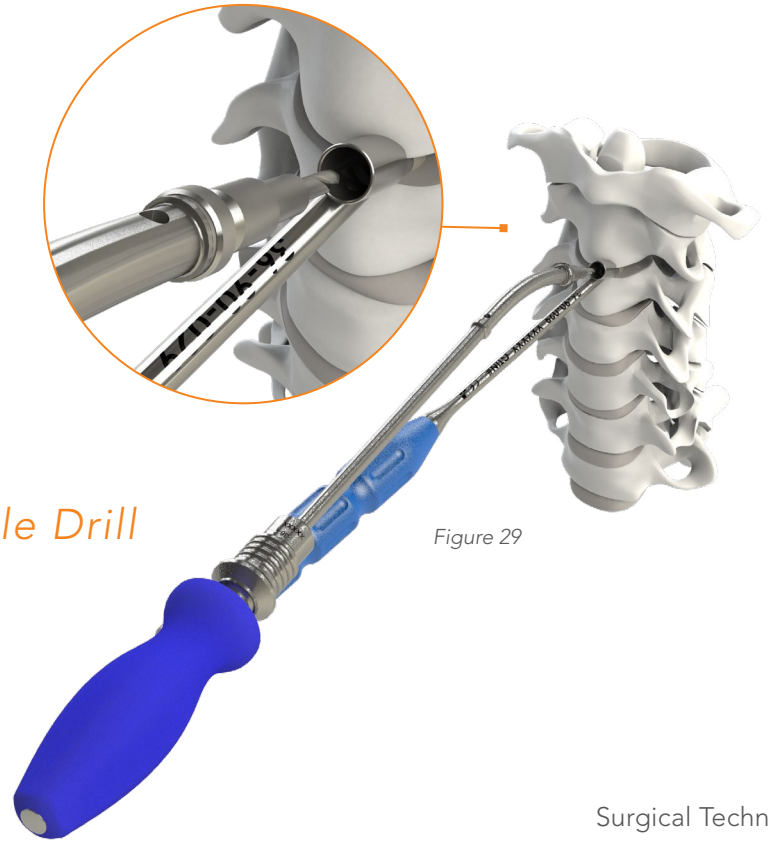


Figure 29

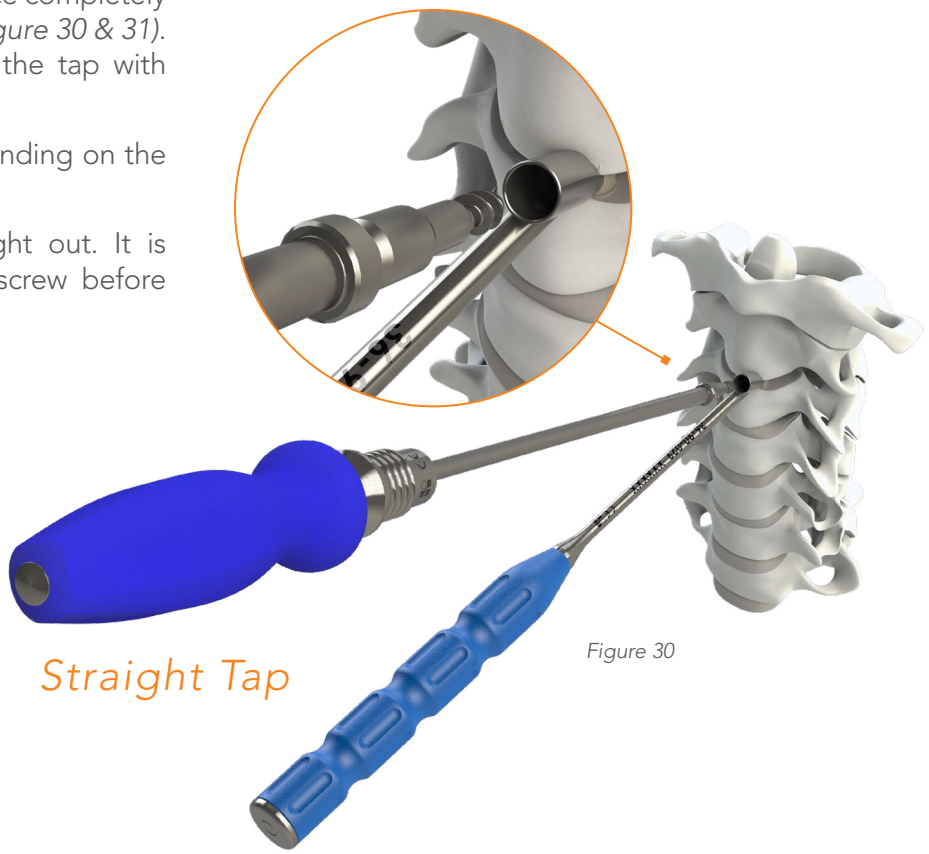
Flexible Drill

Single Guide Tube

Insert the tap variation of your choice completely through the Simple Guide Tube *(Figure 30 & 31)*. Apply pressure on the handle of the tap with rotational motion.

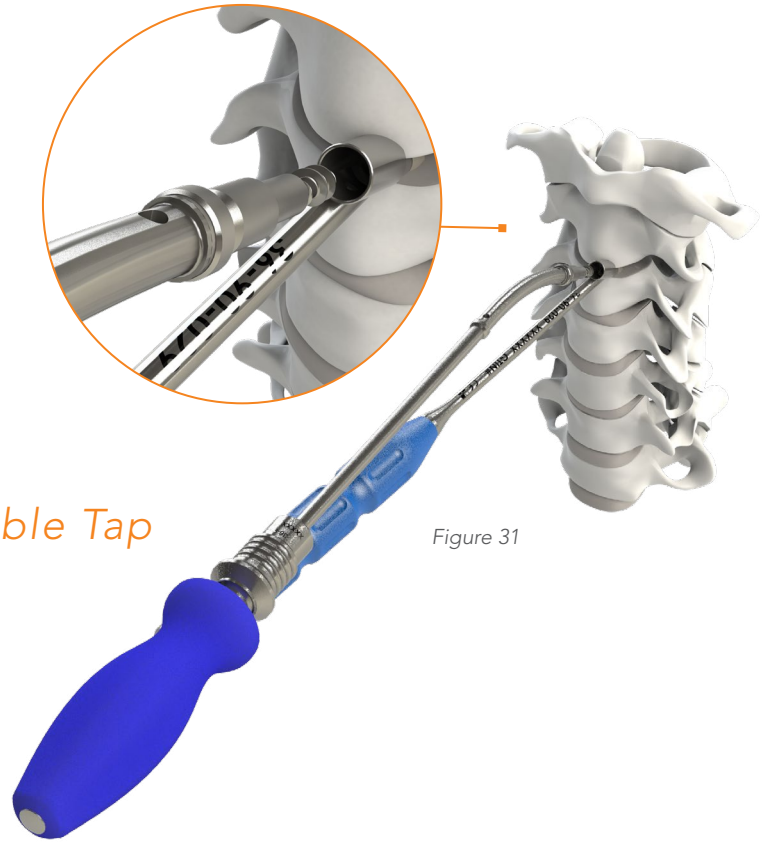
The tap depth is up to 8mm, depending on the height of the spacer.

Remove the tap by pulling straight out. It is recommended to insert the first screw before preparing any other holes.



Straight Tap

Figure 30



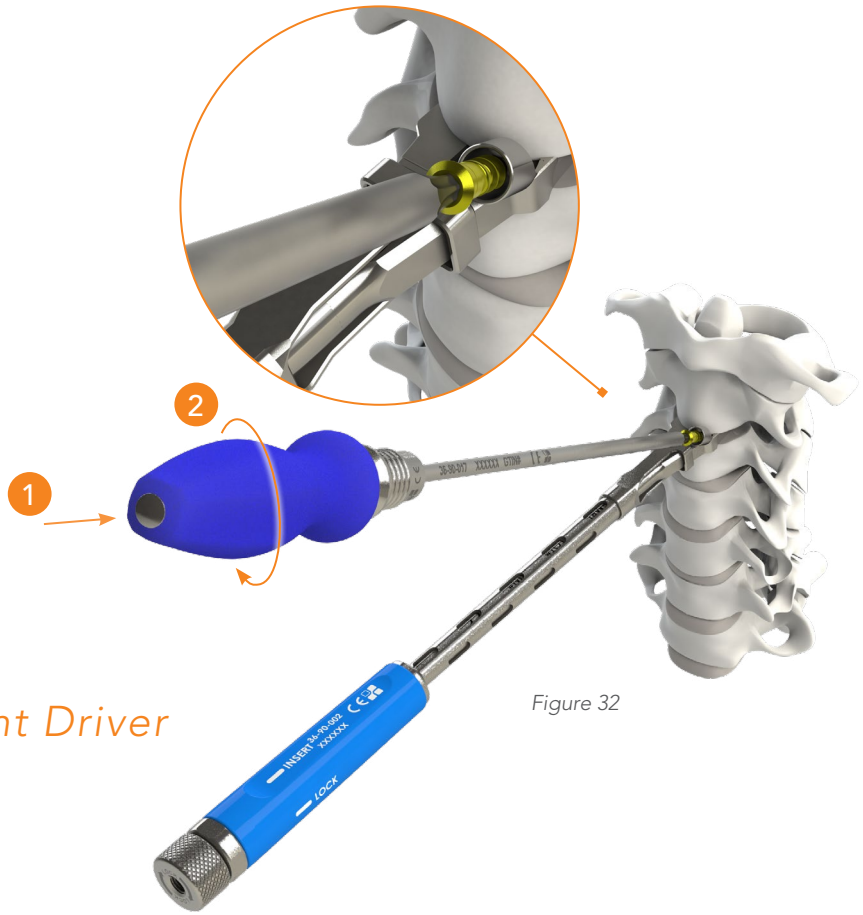
Flexible Tap

Figure 31

Standard Inserter

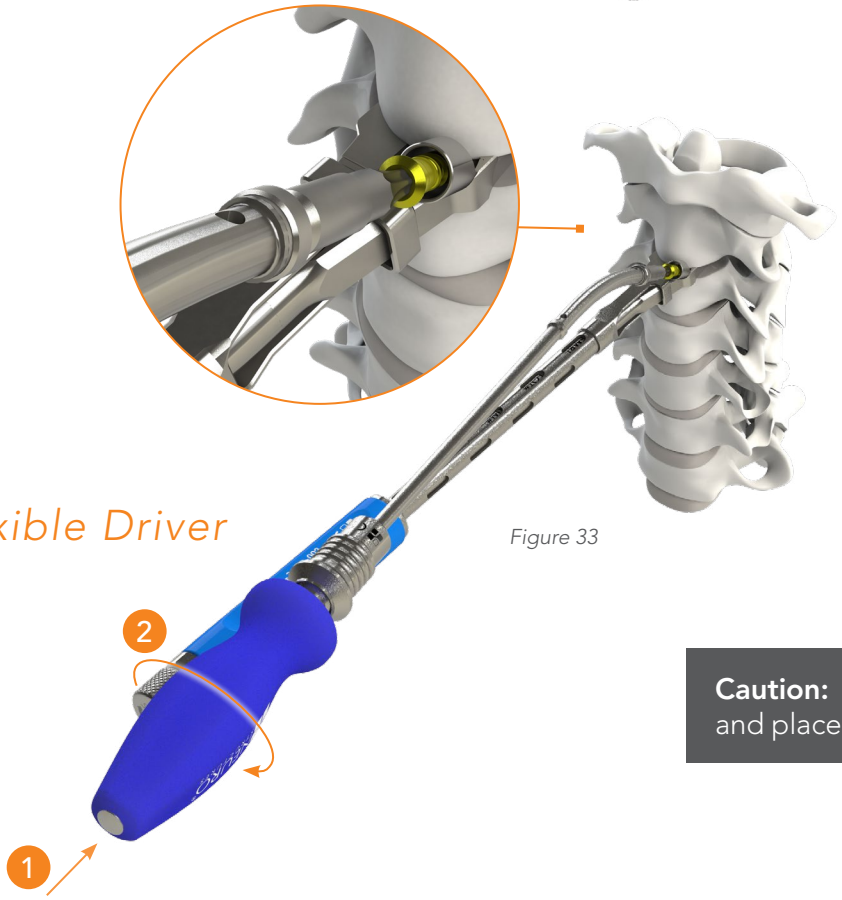
Insert the screw completely through the guide on the Standard Inserter using the Bone Screw Driver variation of your choice *(Figure 32 & 33)*.

Drive the screw into the adjacent vertebral body by turning the screw driver clockwise until solid engagement of the screw is achieved. Remove the Bone Screw Driver by pulling straight out *(Figure 32 & 33)*.



Straight Driver

Figure 32



Flexible Driver

Figure 33

Caution: Verify instrument trajectory and placement with fluoroscopy.

Simple Inserter

Use the Bone Screw Driver of your choice *(Figure 34)*.

Drive the screw into the adjacent vertebral body by turning the screw driver clockwise until solid engagement of the screw is achieved *(Figure 35)*. Remove the Straight Bone Screw Driver by pulling straight out.

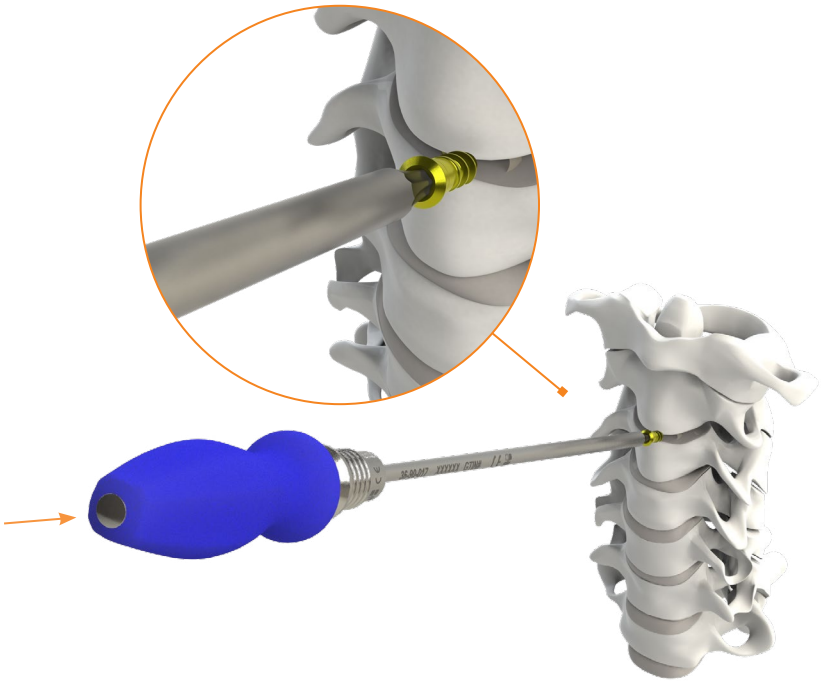


Figure 34

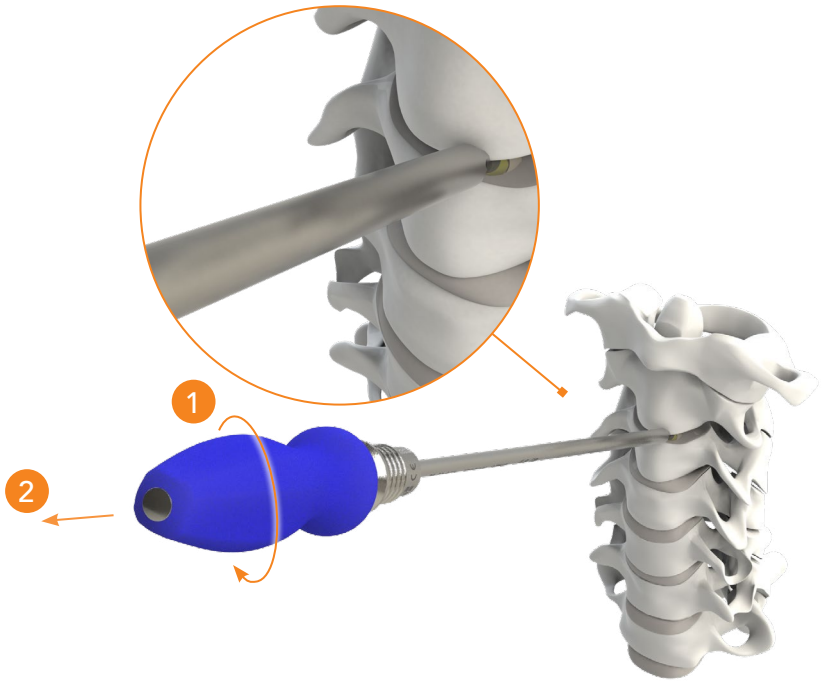


Figure 35

Standard Inserter

Once the bone screws have been inserted and tightened, the cage lock can then be engaged to capture the screws.

Insert the Cage Lock Driver through the Inserter handle *(Figure 36 & 37)*. When the Cage Lock Driver is fully seated, turn it 90° clockwise to capture the screws and lock the cage. Remove the Cage Lock Driver by pulling straight out *(Figure 38)*.

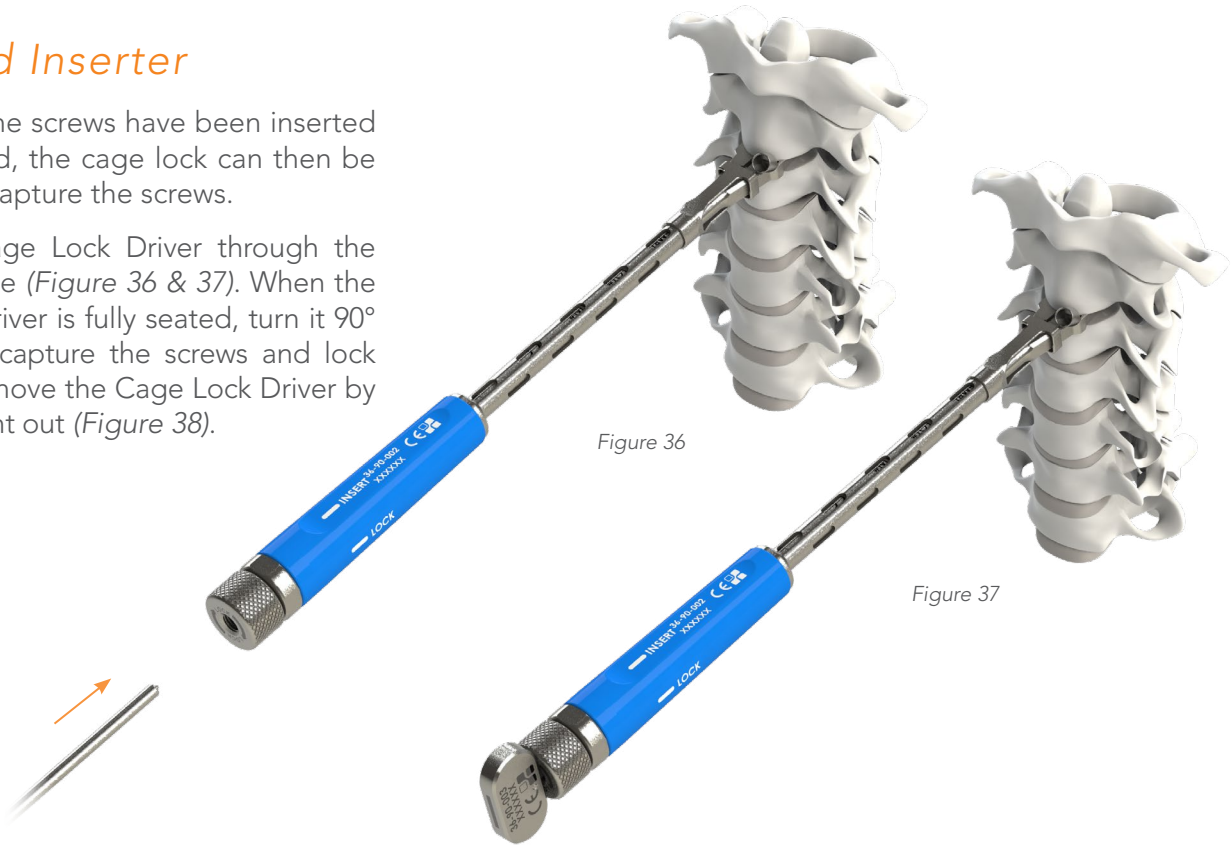


Figure 36

Figure 37

To release the implant from the Standard Inserter, first rotate knob on Inserter Handle counter-clockwise to release Inserter Handle from the Standard Inserter *(Figure 39)*.

Once the grip on implant has loosened, both the Standard Inserter and Inserter Handle can be removed together.

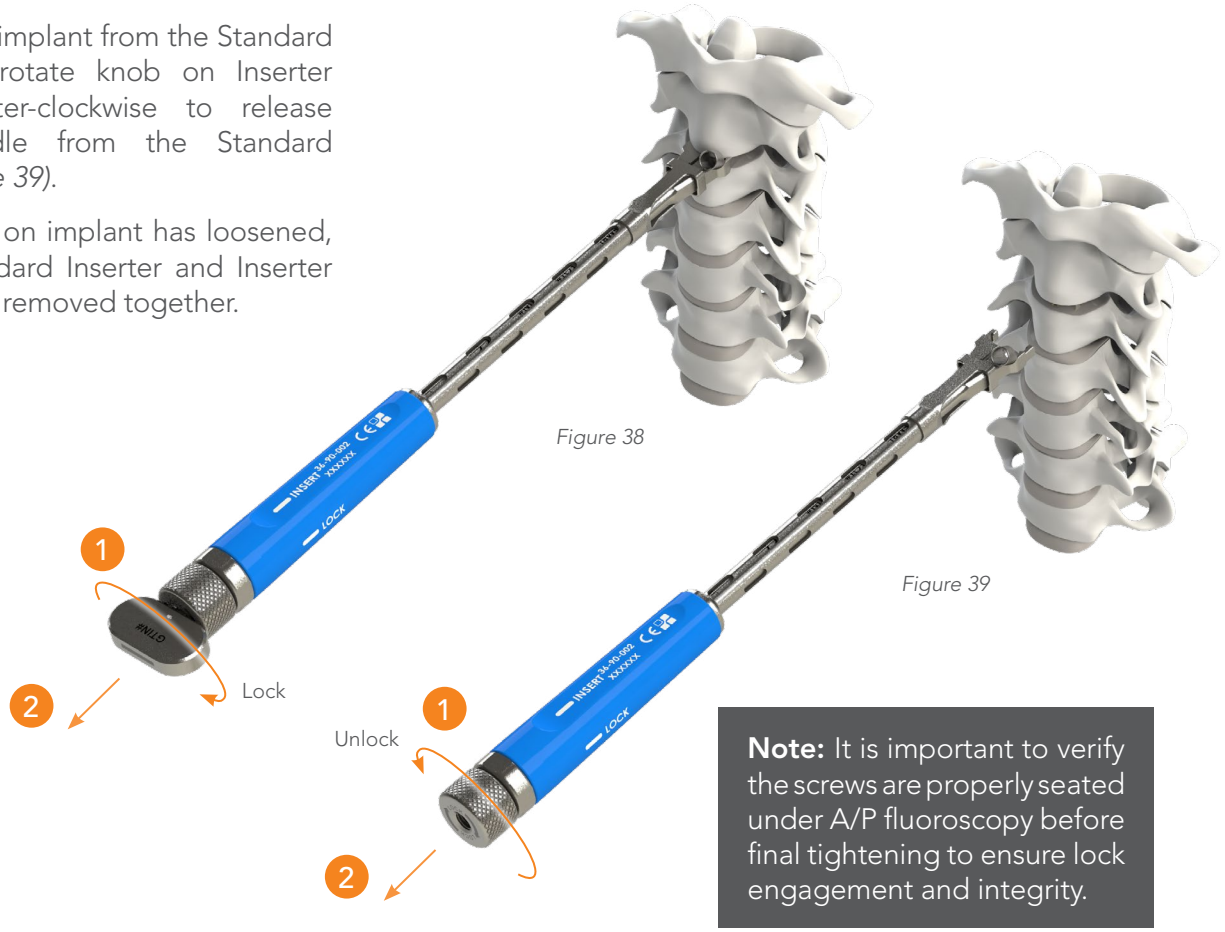


Figure 38

Figure 39

Note: It is important to verify the screws are properly seated under A/P fluoroscopy before final tightening to ensure lock engagement and integrity.

Simple Inserter

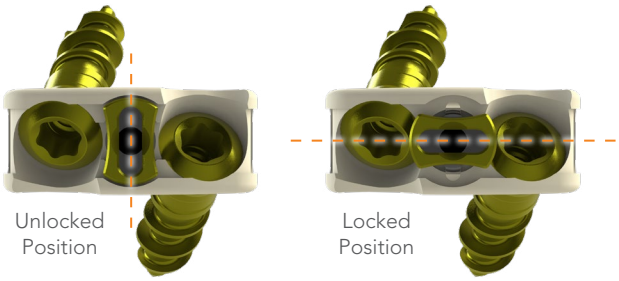


Figure 40

Once the bone screws have been inserted and tightened, the cage lock can then be engaged to capture the screws.

Insert the Cage Lock Driver directly into the locking mechanism *(Figure 41)*. When the Cage Lock Driver is fully seated, turn it 90° clockwise to capture the screws and lock the cage. Remove the Cage Lock Driver by pulling straight out *(Figure 42)*.

Note: It is important to verify the screws are properly seated under A/P fluoroscopy before final tightening to ensure lock engagement and integrity.

Figure 41

Figure 42

8 Final Position

Optimal implant position is in the middle of the disc space *(Figure 43 & 44)*.

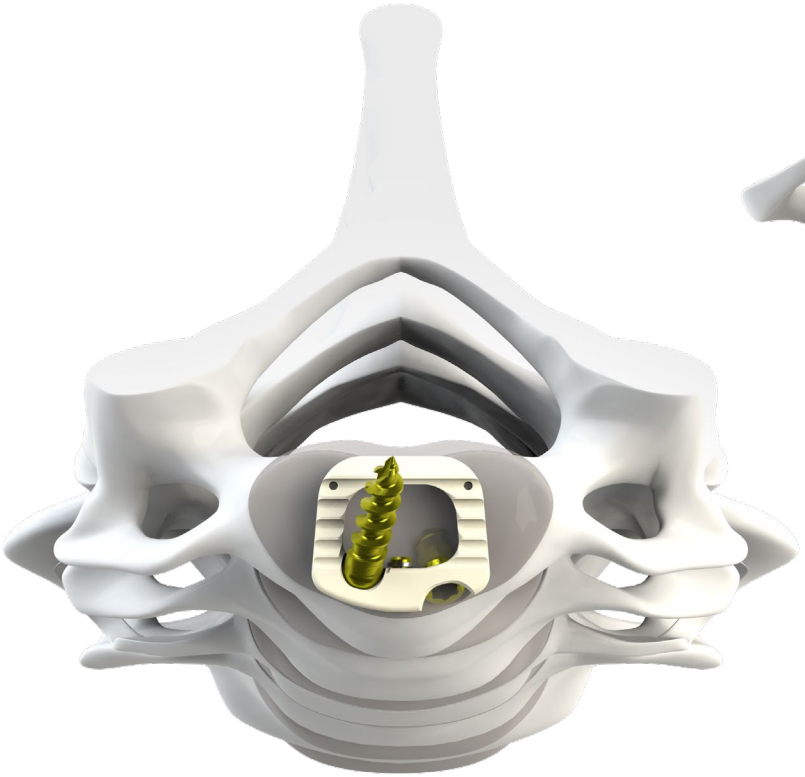


Figure 43

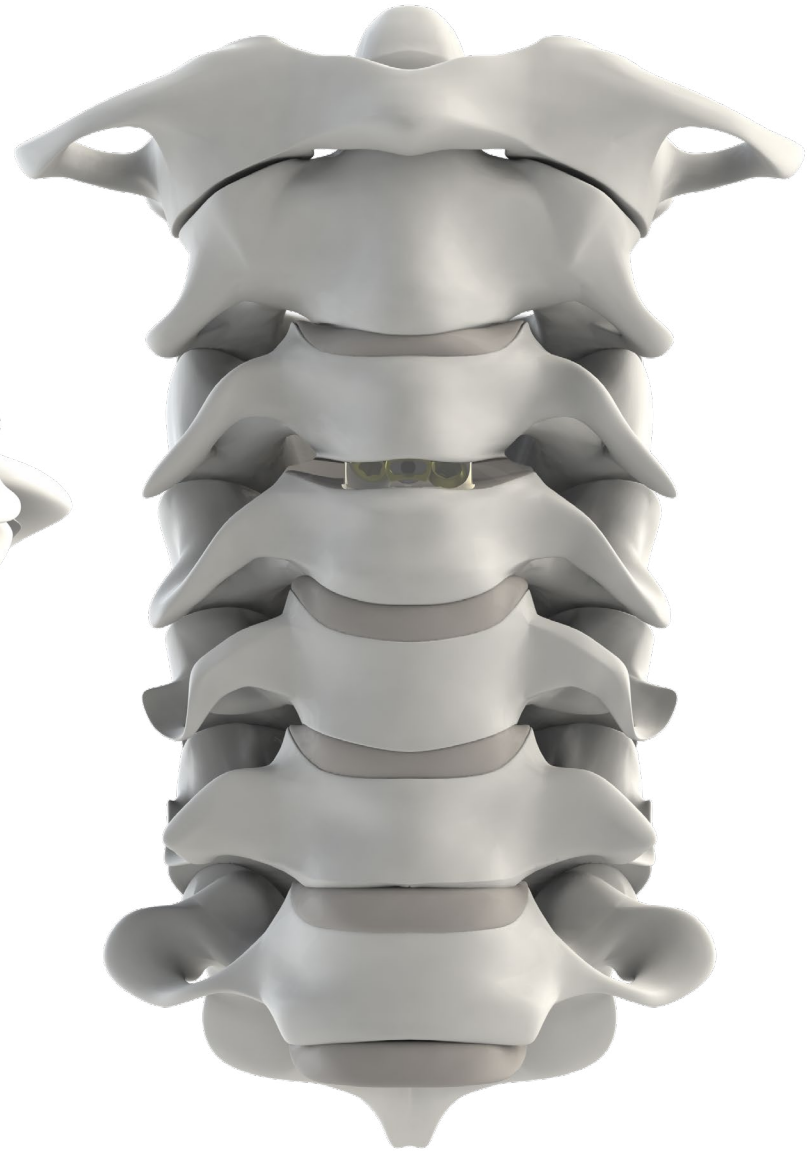


Figure 44

9 Implant Removal

If the implant needs to be removed, first insert the Cage Lock Driver into the locking mechanism *(Figure 46)*.

When the Cage Lock Driver is fully seated, turn it 90° counter-clockwise to release the screws and unlock the cage. Remove the Cage Lock Driver by pulling straight out on the instrument *(Figure 47)*.

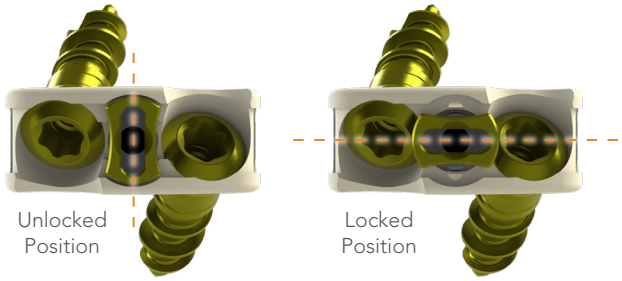


Figure 45

Figure 46

Figure 47

Once the locking mechanism has been unlocked, the Bone Screw Driver then can be used to remove the screws.

Insert the Bone Screw Driver fully into the screw head and turn counter-clockwise until screw is fully removed *(Figure 48 & 49)*.

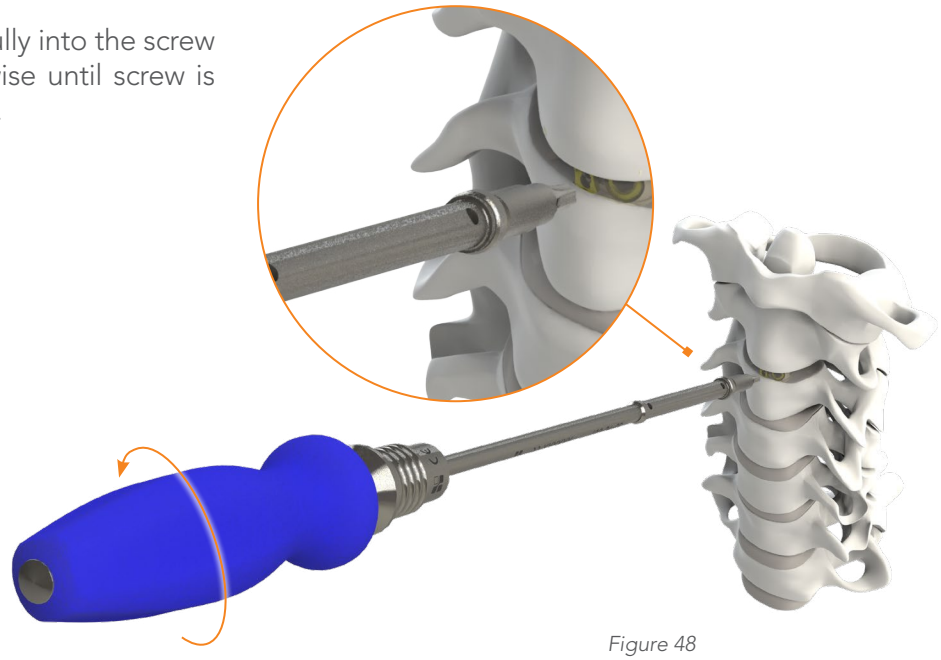


Figure 48

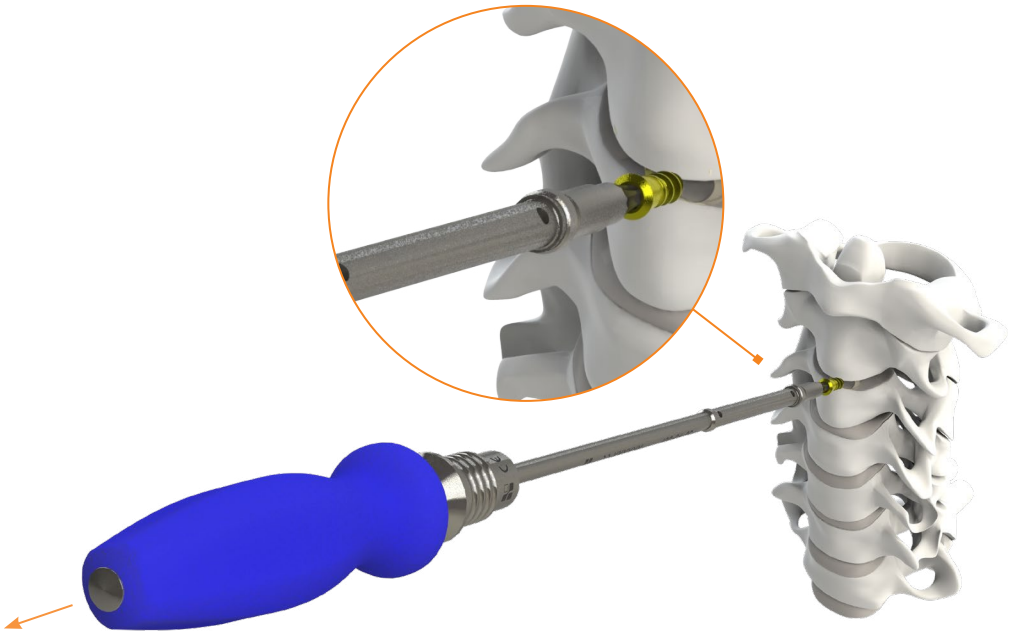


Figure 49

When all screws have been removed, then the Implant Remover can be used.

Connect the Implant Remover to the implant by the two side tabs on the implant. When the Implant Remover is positioned on the implant, compress the handle to lock it onto the implant *(Figure 50 & 51)*.

Remove the implant by pulling straight out on the Implant Remover *(Figure 52)*.

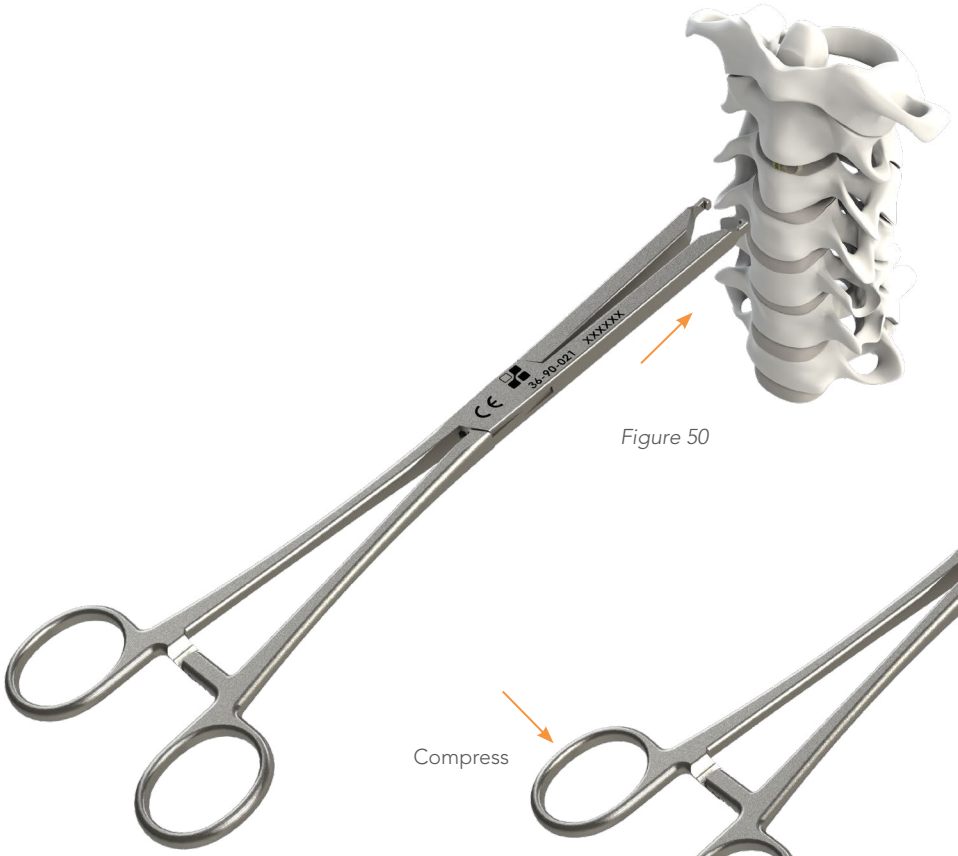


Figure 50

Figure 51

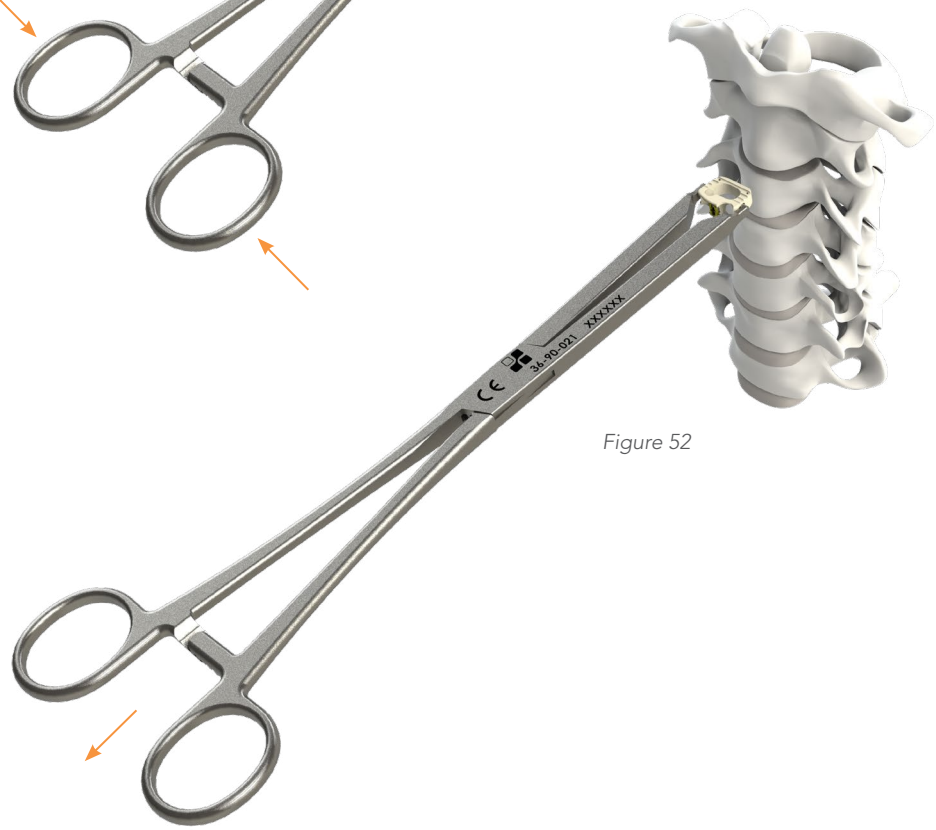


Figure 52

36-90-001-XX
Inserter with Stop

36-90-002
Inserter Handle

36-90-003
Cage Lock Driver

36-90-004
Flexible Awl

36-90-005
Flexible Drill

36-90-006
Flexible Tap

36-90-007
Flexible Bone Screw Driver

36-90-008-XX-XX
Rasp with Handle

36-90-009-XX-XX
Trial with Handle

36-90-010
Non-Ratcheting Axial Handle

36-90-011-XX
Inserter No Stop

36-90-012
Ratcheting Axial Handle

30-90-013
Simple Inserter

36-90-014
Straight Awl

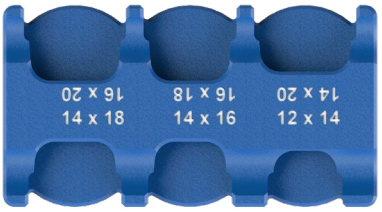
36-90-015
Straight Drill

36-90-016
Straight Tap

36-90-017
Straight Bone
Screw Driver

36-90-0021
Implant Remover

36-90-022
Packing Block Tamp



36-90-023
Packing Block

36-90-024
Angulating Awl

36-90-025
Angulating Drill

36-90-026
Angulating Tap

36-90-027
Angulating Bone
Screw Driver

36-90-028
Implant Pusher

36-90-029
Single Guide Tube

Device Description:

The Cavetto-SA Cervical Cage System is a stand-alone spinal intervertebral fusion device made from medical grade polyetheretherketone (PEEK) as per ASTM F2026. It is provided in a variety of footprints, styles, and sizes to accommodate various patient anatomies.

The Cavetto-SA Cervical Cage System is offered in non-lordotic, anatomic, and 8° lordotic styles ranging from 12mm anterior-posterior x 16mm medial-lateral to 14mm anterior-posterior x 20mm medial-lateral. It is provided in heights from 6mm to 10mm in 1mm size increments and has two radiographic marker pins made from tantalum, per ASTM F560. The implants incorporate integrated anterior screw holes to allow for placement of two titanium alloy screws (per ASTM F136), as well as a titanium alloy locking mechanism for securing the screws once in place.

The Cavetto-SA Cervical Cage System implants and instruments are provided non-sterile and will require thorough cleaning and sterilization prior to each use.

Indications:

The Cavetto-SA Cervical Cage System is intended for spinal fusion procedures at one level (C2 to T1) in skeletally mature patients with degenerative disc disease (defined as pain of discogenic origin with degeneration of the disc confirmed by history and radiographic studies) of the cervical spine. Implants are intended to be implanted via an open, anterior approach and packed with autograft bone and/or allogenic bone graft composed of cancellous and/or corticocancellous bone graft. This cervical device is to be used in patients who have had six weeks of non-operative treatment. The Cavetto-SA Cervical Cage System should be used with the provided bone screws and requires no additional supplementary fixation systems.

Contraindications:

Contraindications include, but are not limited to:

- Infection, local to the operative site.
- Allergy to PEEK, titanium alloy or tantalum.
- Signs of local inflammation.
- Fever or leukocytosis.
- Morbid obesity.
- Pregnancy.
- Mental illness.
- Grossly distorted anatomy due to congenital abnormalities.
- Any medical or surgical condition which would preclude the potential benefit of spinal implant surgery, such as the elevation of sedimentation rate unexplained by other diseases, elevation of white blood count (WBC), or a marked left shift in the WBC differential count.
- Rapid joint disease, bone absorption, osteopenia, and/or osteoporosis. Osteoporosis is a relative contraindication since this condition may limit the degree of obtainable correction, the amount of mechanical fixation, and/or the quality of the bone graft.
- Any case not needing a bone graft and fusion or where fracture healing is not required.
- Any case requiring the mixing of metals from different components.
- Any patient having inadequate tissue coverage over the operative site or where there is inadequate bone stock, bone quality, or anatomical definition.
- Any case not described in the Indications.
- Any patient unwilling to cooperate with the post-operative instructions.
- Reuse or multiple use.
- Any time implant utilization would interfere with anatomical structures or expected physiological performance.

Potential Complications and Adverse Effects:

Potential complications and adverse effects include, but are not limited to:

- Early or late loosening of any or all of the components.
- Disassembly, bending, and/or breakage of any or all of the components.
- Cessation of growth of the fused portion of the spine.
- Foreign body (allergic) reaction to implants, debris, corrosion products, graft material, including metallosis, staining, tumor formation, and/or auto-immune disease.
- Pressure on the skin from component parts in patients with inadequate tissue coverage over the implant possibly causing skin penetration, irritation, and/or pain. Bursitis Tissue damage caused by improper positioning and placement of implants or instruments.
- Post-operative change in spinal curvature, loss of correction, height, and/or reduction.
- Infection and/or wound complications.
- Dural tears, pseudomeningocele, fistula, persistent CSF leakage, and/or meningitis.
- Loss of neurological function, including paralysis (complete or incomplete), dysesthesias, hyperesthesia, anesthesia, paraesthesia, appearance of radiculopathy, and/or the development or continuation of pain, numbness, neuroma, or tingling sensation.
- Neuropathy, neurological deficits (transient or permanent), bilateral paraplegia, reflex deficits, and/or arachnoiditis.
- Loss of bowel and/or bladder control, or other types of urological system compromise.
- Scar formation possibly causing neurological compromise around nerves, and/or pain.

- Fracture, microfracture, resorption, damage, or penetration of any spinal bone, and/or bone graft or bone graft harvest site at, above, and/or below the level of surgery.
- Interference with roentgenographic, CT, and/or MR imaging because of the presence of the implants.
- Non-union (or pseudoarthrosis). Delayed union. Mal union.
- Loss of spinal mobility or function. Inability to perform the activities of daily living.
- Malalignment of anatomical structures (i.e. loss of normal spine contours or change in height).
- Bone loss or decrease in bone density, possibly caused by stress shielding.
- Graft donor site complications including pain, fracture, or wound healing problems.
- Subsidence of the device into the vertebral body.
- Pain or discomfort.
- Atelectasis, ileus, gastritis, herniated nucleus pulposus, and/or retropulsed graft.
- Hemorrhage, hematoma, seroma, embolism, edema, stroke, excessive bleeding, phlebitis, wound necrosis, wound dehiscence, or damage to blood vessels.
- Gastrointestinal and/or reproductive system compromise, including sterility and loss of consortium.
- Development of respiratory problems, e.g. pulmonary embolism, bronchitis, pneumonia, etc.
- Change in mental status.
- Revision surgery.
- Death.

Note: Additional surgery may be necessary to correct some of these potential adverse effects.

Warnings and Precautions:

The implantation of the Cavetto-SA Cervical Cage System should be performed only by experienced spinal surgeons with specific training in the use of this device because this is a technically demanding procedure presenting a risk of serious injury to the patient.

A successful result may not occur in every case in which the Cavetto-SA Cervical Cage System is implanted. Failure rates in spinal fusion procedures are published, and spinal fusion failure is an accepted risk of the procedure. This is particularly true for patients who choose to smoke tobacco products, patients in malnourished or obese states, or who abuse alcohol products.

The Cavetto-SA cage is NOT intended to be used without the Cavetto-SA fixation screws provided and should NOT be implanted alone without the support of the fixation screws.

The device is not intended or expected to be the only mechanism of support of the spine. Regardless of the etiology of the spine pathology for which the implantation of this device was chosen, it is the expectation and requirement that adequate anterior column support exists, either by virtue of existing anatomy or by means of a spinal fusion or arthrodesis. Without solid biological anterior column support, the device cannot be expected to support the spine indefinitely, and will fail in any of several modes.

These modes may include bone-implant interface failure, implant failure, or bone failure.

Physician Note:

Although 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.

Caution:

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

OTHER PREOPERATIVE, INTRAOPERATIVE, AND POSTOPERATIVE WARNINGS ARE AS FOLLOWS:

Implant Selection:

The selection of the proper size, shape, and design of the implant for each patient is crucial to the success of the procedure. Surgical implants are subject to repeated stresses in use, and their strength is limited by the need to adapt the design to the size and shape of human bones. Unless great care is taken in patient selection, proper placement of the implant, and postoperative management to minimize stresses on the implant, such stresses may cause fatigue and consequent breakage, bending or loosening of the device before the healing process is complete. This may result in further injury or the need to remove the device prematurely.

Use of the Cavetto-SA Cervical Cage System should only be considered when the following preoperative, intraoperative, and postoperative conditions exist.

Preoperative:

Proper selection of patients and good compliance of patients with post-surgical instructions are an integral part of the realization of a successful surgical procedure. All patients contemplating implantation of this device should be apprised of the risks associated with the procedure as well as the limitations regarding activities that the patient will face following surgery.

A successful result is not achieved in every surgical case, especially in spinal surgery where many extenuating circumstances may compromise results. Preoperative planning and operating procedures, including knowledge of surgical techniques, proper reduction, and proper selection and placement of the implant are critical considerations in achieving a successful result. Longevity of the implant depends on the weight and activity level of the patient, patient mortality, or need for component replacement secondary to patient weight and activity level.

The correct selection of the implant is extremely important. The potential for success is increased by the selection of the proper size of the implant. An adequate inventory of sizes should be available at the time of surgery, including sizes larger and smaller than those expected to be used.

Intraoperative:

Care should be used in the handling of the implant components. The implants should not be scratched or otherwise damaged.

Extreme caution should be used around the spinal cord and nerve roots. Damage to the nerves will cause loss of neurological functions.

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.

It is recommended to use an imaging system to verify that the implant is properly placed and correctly aligned within the disc space.

Different manufacturers use different materials, varying tolerances, and design configurations. Components of the Cavetto-SA Cervical Cage System must not be used with components from any other system or manufacturer.

Postoperative:

The physician's post-operative directions and warnings to the patient and the corresponding patient compliance are extremely important. It is recommended that regular, long-term postoperative follow-up be undertaken to detect early signs of component wear, and to consider the course of action to be taken if such events occur.

Periodic x-rays should be taken to detect evidence of positional changes, failed fusion, and/or device fracture. In such cases, patients should be closely monitored and the benefits of revision surgery should be considered to avoid further deterioration.

Detailed instructions on the use and limitations of the device should be given to the patient. If partial weight-bearing is recommended or required prior to forming bony union, the patient must be warned that loosening or breakage of the implant is a complication which can occur as a result of excessive or early weight-bearing or excessive muscular activity. It is important that immobilization of the surgical site be maintained until bony union consolidated and been confirmed by radiographic examination. The patient must be adequately warned of these hazards and closely supervised to ensure cooperation until bony union is confirmed. The risk of loosening of an implant during postoperative rehabilitation may be increased if the patient is active, or if the patient is debilitated, demented, or otherwise unable to use crutches or other such weight supporting devices. The patient should be warned to avoid falls or sudden jolts in spinal position. The patient should be advised not to smoke or consume alcohol during the autogenous bone graft healing process.

All patients should be instructed on the limitations of the device and the possibility of subsequent surgery. The patient should be instructed to limit and restrict physical activities, especially lifting and twisting motions, and any type of sport participation. Patients should be advised of their inability to bend at the point of spinal fusion and taught to compensate for this permanent restriction in body motion.

If a non-union develops or the components loosen, bend, and/or break, the device(s) should be revised, and/or removed immediately before serious injury occurs. Failure to immobilize a delayed or nonunion of bone will result in excessive and repeated stresses on the implant. By the mechanism of fatigue these stresses can cause eventual bending, loosening, or breakage of the device(s).

Any retrieved devices should be treated in such a manner that reuse in another surgical procedure is not possible. As with all orthopedic implants, none of the Cavetto-SA Cervical Cage System implants should ever be reused under any circumstances. Any implant, once used, should be discarded; even though it may appear undamaged, it may have small defects and internal stress patterns which may lead to early breakage.

Decontamination and Cleaning:

Unless just removed from an unopened package, all instruments and implants must be disassembled (if applicable), and thoroughly cleaned using neutral cleaners before sterilization and introduction into a sterile surgical field, or (if applicable) returned to NeuroStructures, Inc. Cleaning and disinfecting of instruments can be performed with aldehyde-free solvents at higher temperatures. Cleaning and decontamination must include the use of neutral cleaners followed by a deionized water rinse.

PRE-CLEAN PROCEDURE – INSTRUMENTS ONLY

1. It is recommended that instruments should be reprocessed as soon as is reasonably practical following use.
2. Keep instruments moist, and do not allow blood and/or bodily fluids to dry on the instruments.

3. Open instruments with ratchets, box locks, or hinges.
4. Remove sharp instruments for manual cleaning or place into a separate tray.
5. Lumen/cannula of instruments should be manually processed prior to cleaning. Lumen/cannula should first be cleared of debris. Lumen/cannula should be brushed thoroughly using appropriately sized soft-bristled brushes and twisting action. Brushes should be tight-fitting. Brush size should be approximately the same diameter of the lumen/cannula to be cleaned. Using a brush that is too big or too small for the diameter of the lumen/cannula may not effectively clean the surface of a lumen/cannula. After brushing lumen/cannula, blow clean compressed air through the lumen/cannula to clear debris, if necessary.
6. Soak and/or rinse heavily soiled instruments or cannulated instruments prior to cleaning to loosen any dried soil or debris. Use a neutral pH enzymatic soak or detergent to soak devices. Follow the enzymatic cleaner or detergent manufacturer's instructions for use for correct exposure time, temperature, water quality, and concentration. Use cold tap water to rinse instruments.
7. Do not use saline or chlorinated solutions.
8. Cavetto-SA Cervical Cage System instruments must be cleaned separately from instrument trays and cases. Lids should be removed from cases for the cleaning process, if applicable.

MANUAL CLEANING PROCEDURE – INSTRUMENTS ONLY

Equipment: Use various sized soft-bristled brushes, lint-free cloths, syringes, pipettes, and/or water jet, neutral enzymatic cleaner, or neutral detergent with a pH between 7 – 9.

1. Rinse soiled instrument under running cold tap water for a minimum of two minutes. Use a soft-bristled brush to assist in the removal of gross soil and debris.
2. Soak instrument in a neutral pH enzymatic cleaner or detergent solution for a minimum of ten minutes. Follow the enzymatic cleaner or detergent manufacturer's instructions for use for correct exposure time, temperature, water quality, and concentration.
3. Rinse device with cold water for a minimum of two minutes. Use a syringe, pipette, or water jet to flush lumens, channels, and other hard to reach areas.
4. Manually clean instrument for a minimum of five minutes in a freshly prepared neutral pH enzymatic cleaner or detergent solution. Use a soft-bristled brush to remove soil and debris. Actuate joints, handles, and other movable instrument features to expose all areas to the detergent solution, if applicable. Clean instrument under water to prevent aerosolization of contaminants.

   Note: Fresh solution is a newly-made, clean solution.
5. Rinse instrument thoroughly with deionized (DI) or purified (PUR) water for a minimum of two minutes. Use a syringe, pipette, or water jet to flush lumens and channels. Actuate joints, handles, and other moveable instrument features in order to rinse thoroughly under running water, if applicable.
6. Visually inspect instrument. Repeat the manual cleaning procedure (steps 2 - 6) until no visible soil remains on instrument.
7. Perform a final rinse on instrument using DI or PUR water.
8. Dry device using a clean, soft, lint-free cloth, or clean compressed air.

Please see the below table for the recommended cleaning parameters:

Cycle	Minimum Time (Minutes)	Minimum Temperature/Water	Type of Detergent
Rinse 1	2	Cold tap water	N/A
Soak	10	Cold to warm tap water	Neutral enzymatic pH between 7 – 9
Rinse 2	2	Cold tap water	N/A
Wash	5	Warm tap water (>40°C)	Detergent with pH between 7 – 9
Rinse 3	2	Warm DI or PUR (>40°C)	N/A
Final Rinse	2	Cold DI or PUR	N/A

Note: Certain cleaning solutions such as those containing formalin, glutaraldehyde, bleach, and/or other alkaline cleaners may damage some devices, particularly instruments; these solutions should not be used. Also, many instruments require disassembly before cleaning. No visual contamination shall be present after cleaning, so the instruments shall be re-cleaned if they are not visually clean.

All products should be treated with care. Improper use or handling may lead to damage and/or possible improper functioning of the device.

It is recommended that devices should be reprocessed as soon as is reasonably practical following use.

Visually inspect all reusable devices for signs of wear and tear before each use. Any devices with corrosion, discoloration, or cracked seals should be returned to the manufacturer.

Sterility:

Unless noted otherwise on the package labeling, the Cavetto-SA Cervical Cage System components are provided non-sterile. These products need to be steam sterilized by the hospital using the following method:

Steam Sterilization Cycle Type	Exposure Time At 132 °C (270 °F)	Drying Times
Dynamic Air Removal: Pre-Vacuum	4 min	20 – 30 min

Remove all packaging materials prior to sterilization. Only FDA-cleared wraps should be used. Use only sterile products in the operating field. After surgery, immediately decontaminate, clean, and re-sterilize before handling, or (if applicable) return the re-sterilized product to NeuroStructures, Inc.

Implants and instruments are provided non-sterile.

Magnetic Resonance Environments:

The Cavetto-SA Cervical Cage System has not been evaluated for safety and compatibility in the MR environment. The Cavetto-SA Cervical Cage System has not been tested for heating or migration in the MR environment.

Product Complaints:

Any Health Care Professional (e.g., customer or user of this system of products), who has any complaints or who has experienced any dissatisfaction in the product quality, identity, durability, reliability, safety, effectiveness, and/or performance, should notify the manufacturer, NeuroStructures, Inc. Further, if any of the implanted Cavetto-SA Cervical Cage System component(s) ever "malfunctions," (i.e., does not meet any of its performance specifications or otherwise does not perform as intended), or is suspected of doing so, the manufacturer should be notified immediately. If any NeuroStructures, Inc. product ever "malfunctions" and may have caused or contributed to the death or serious injury of a patient, the manufacturer should be notified immediately by telephone and written correspondence. When filing a complaint, please provide the component(s) name, part number, lot number(s), your name and address, the nature of the complaint, and notification of whether a written report from the manufacturer is requested.

Further Information:

Recommended directions for use of this system (surgical operative techniques) are available at no charge upon request. If further information is needed or required, please contact:

NeuroStructures, Inc., 199 Technology, Suite 110, Irvine, CA 92618, 800-352-6103.

www.neurostructures.com

Notes

NOTES *CONT.*

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06/18 Rev. 003 NS-100-183