



**Medtronic**  
SOFAMOR DANEK

# CAPSTONE™

## Instrument Set Technique

as described by:

**Charles Branch, Jr., M.D.**

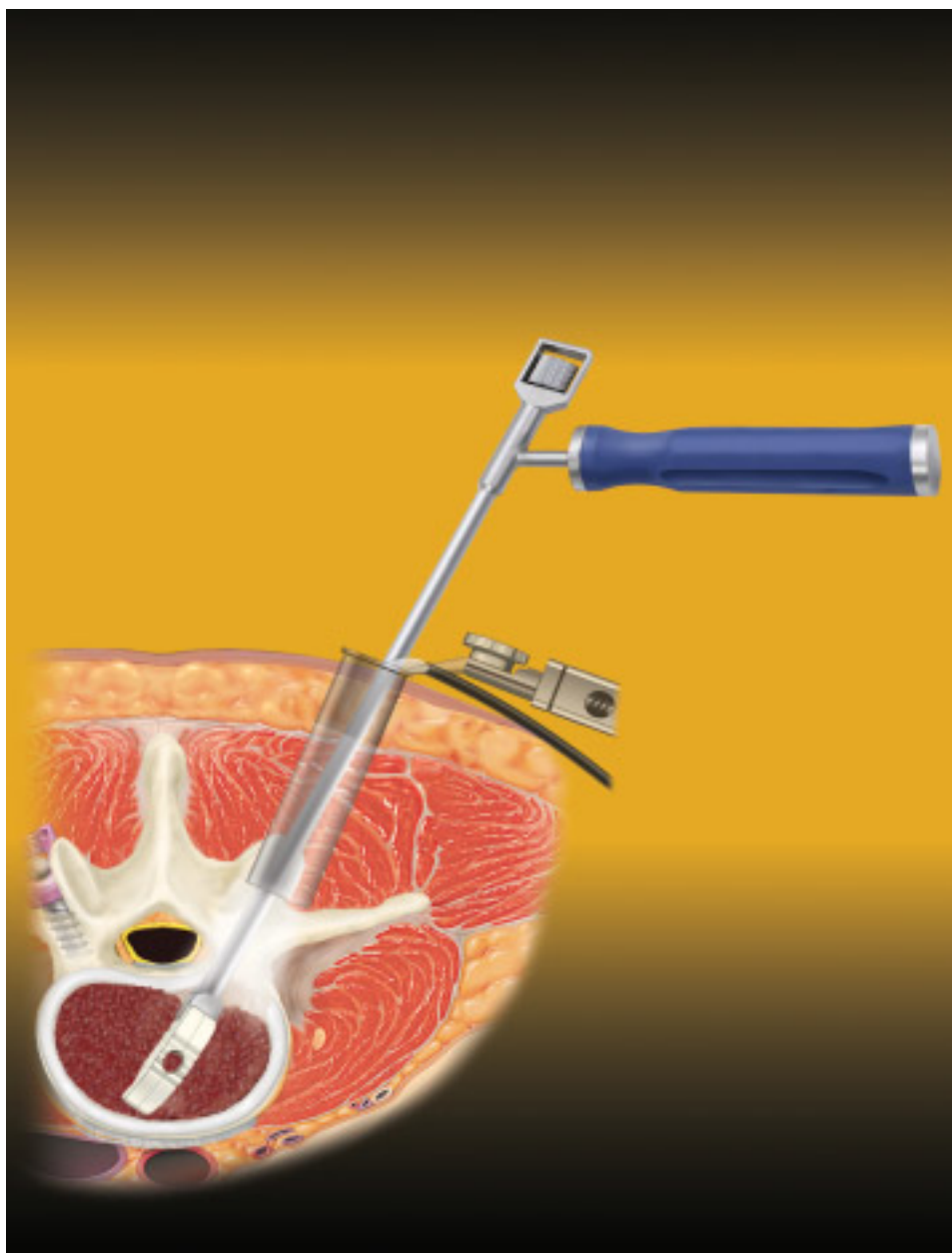
Wake Forest University  
Baptist Medical Center  
Winston-Salem,  
North Carolina

**Kevin Foley, M.D.**

Semmes-Murphey Clinic  
Neurologic & Spine Institute  
Memphis, Tennessee

**Anthony Salerni, M.D.**

Neurosurgery  
Lakes Regional Hospital  
Laconia, New Hampshire



 **CAPSTONE™**  
Instrument Set





*THE MOST VERSATILE INNOVATION  
IN INTERBODY INSTRUMENTATION*

Versatile Design

- Bilateral or unilateral procedural solutions combining CAPSTONE™ Instruments, METRx™ Tube, PYRAMETRIX® Advance Instruments, and CD HORIZON® SEXTANT™ Rod Insertion System
- Open, mini-open or MAST approaches
- Bullet shape distractor/trials for self-distraction and easier insertion
- Convex shape trials better match patient anatomy and allow more accurate sizing
- Simple five-step procedure (bony resection, distraction, disc space prep, trial and insertion of construct)

## CONTENTS

## Surgical Technique Steps

|                               |   |
|-------------------------------|---|
| <b>Instruments.</b> . . . . . | 3 |
|-------------------------------|---|

**Unilateral Technique Open and MAST:**

|                                                  |    |
|--------------------------------------------------|----|
| Laminotomy, Facetectomy and Discectomy . . . . . | 5  |
| Distraction . . . . .                            | 6  |
| Disc Space Preparation . . . . .                 | 7  |
| Endplate Preparation . . . . .                   | 8  |
| Trial Insertion . . . . .                        | 9  |
| Insert Construct . . . . .                       | 10 |
| Final Placement . . . . .                        | 11 |
| Additional Fixation Options . . . . .            | 12 |

**Bilateral Technique Open and MAST:**

|                                                  |    |
|--------------------------------------------------|----|
| Laminotomy, Facetectomy and Discectomy . . . . . | 14 |
| Distraction . . . . .                            | 15 |
| Disc Space Preparation . . . . .                 | 16 |
| Endplate Preparation . . . . .                   | 17 |
| Trial Insertion . . . . .                        | 18 |
| Insert Construct . . . . .                       | 19 |
| Final Placement . . . . .                        | 20 |
| Additional Fixation Options . . . . .            | 21 |

|                                         |    |
|-----------------------------------------|----|
| <b>Important Information.</b> . . . . . | 22 |
|-----------------------------------------|----|

## INSTRUMENTS



Distractor  
2980822



Distractor  
2981032



Inserter  
2980001

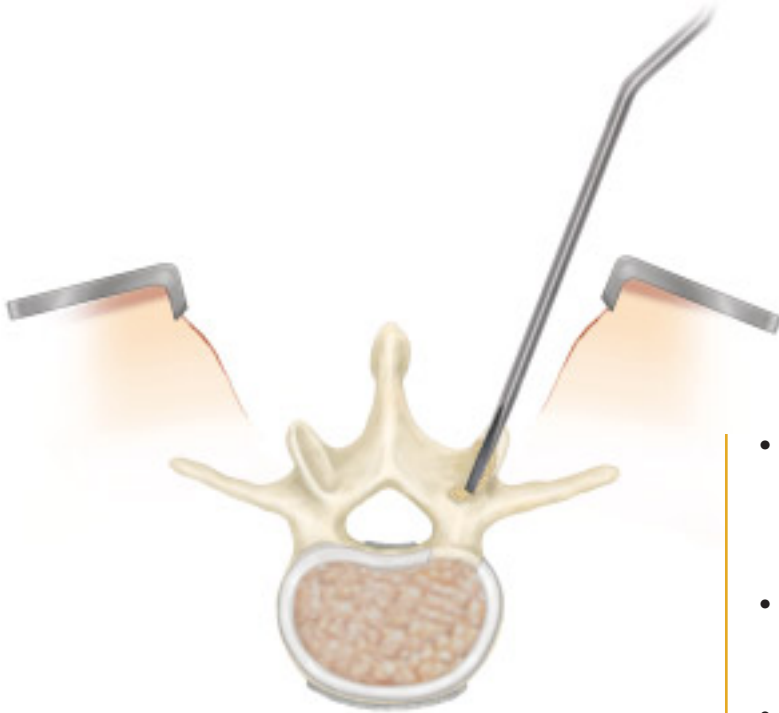


Slap Hammer  
9074002

# UNILATERAL TECHNIQUE

## OPEN AND MAST

## Laminotomy, Facetectomy and Discectomy

UNILATERAL OPEN  
TECHNIQUE

- A facetectomy is performed on the ipsilateral side. Using an Osteotome or drill, remove the ascending and descending articular processes.
- Additional bony removal may be carried out using a Kerrison Rongeur or drill.
- A 1cm square annulotomy is made with a scalpel in Kambin's Triangle. The disc is removed using a Pituitary Rongeur and Curettes.

The main goal of this step is to remove extruded fragments, to decompress neural elements, and to provide entry into the disc space for distraction with minimal or no nerve root retraction. If there is significant disc space collapse, a complete discectomy may not be possible until disc space distraction is accomplished.



Discectomy

UNILATERAL MAST  
TECHNIQUE

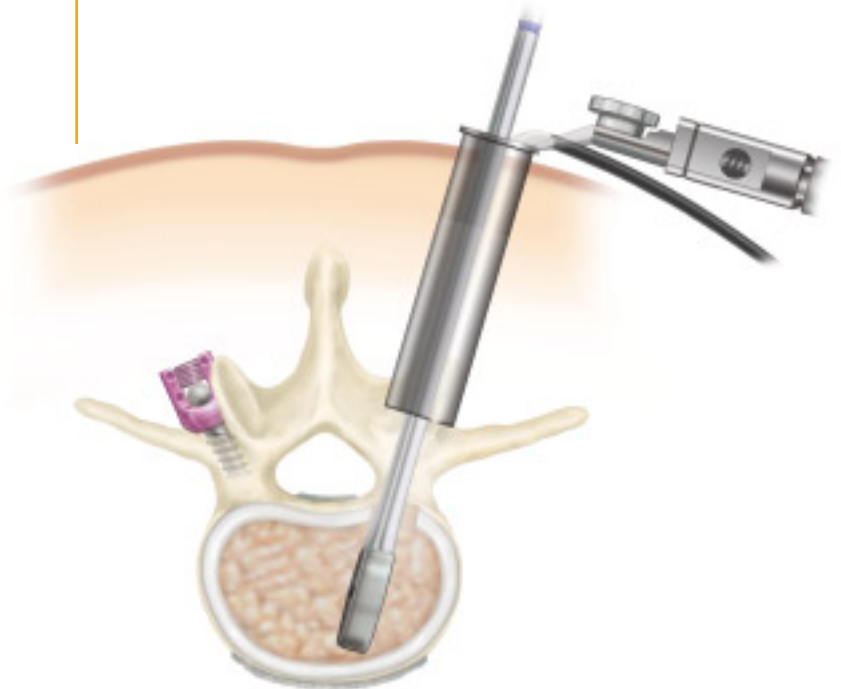
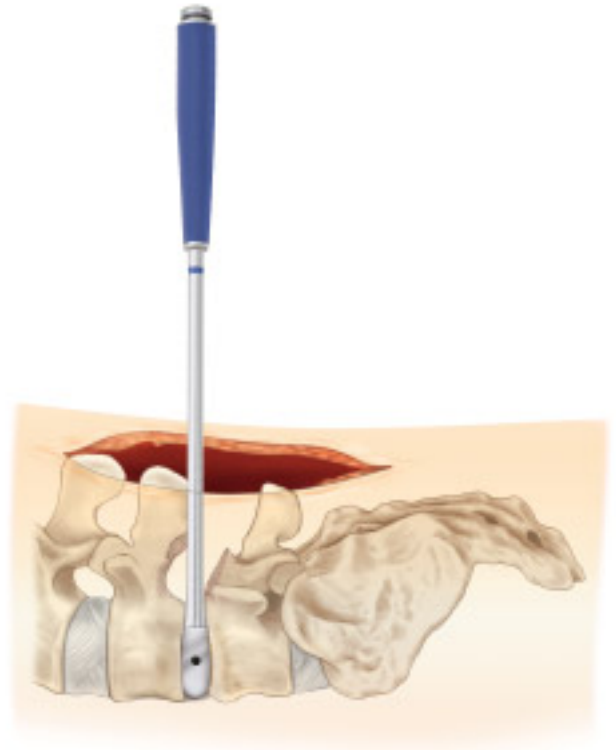
## UNILATERAL OPEN TECHNIQUE

### Distraction



The disc space is sequentially distracted until adequate disc space height is obtained and adequate foraminal size is restored.

- Insert the Distractor with the curved sides touching the endplates.
- Sequentially insert Distractors until the desired height is obtained.
- Insert supplemental screw and rod fixation on contralateral side to maintain distraction during disc space preparation.
- Provisionally tighten construct.



## UNILATERAL MAST TECHNIQUE

## Disc Space Preparation

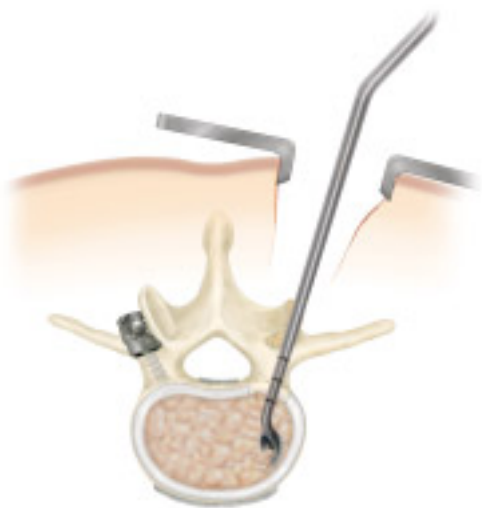
UNILATERAL OPEN  
TECHNIQUE

Remove disc using either the Straight or Curved Rotating Cutters. The Rotating Cutters are blunt tipped and side cutting to improve safety. A T-handle or a handheld power drill may be used for more efficient removal of disc.

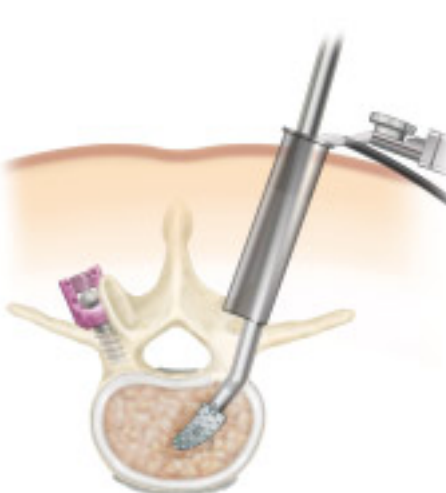
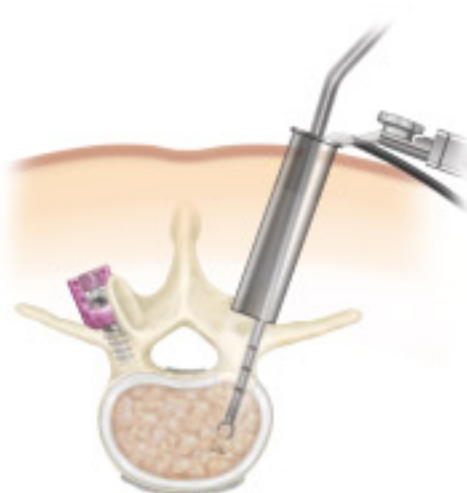
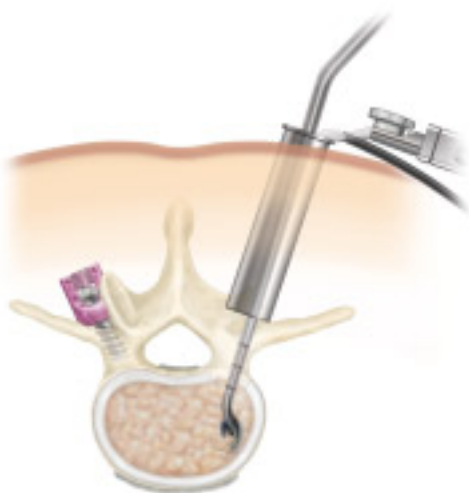


## UNILATERAL OPEN TECHNIQUE

## Endplate Preparation

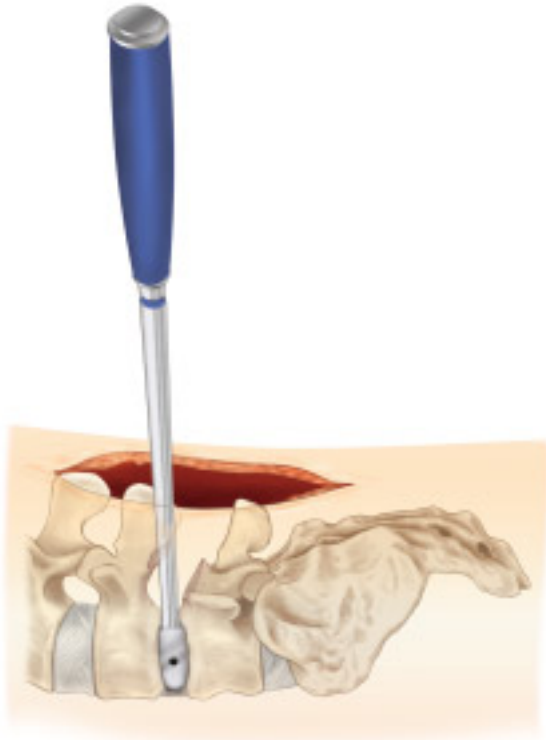


- Specifically designed angled instruments allow disc resection and endplate preparation.

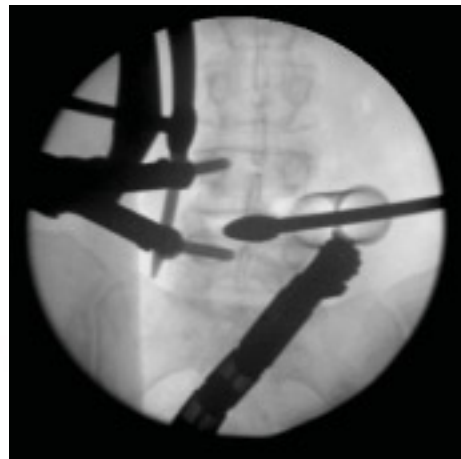
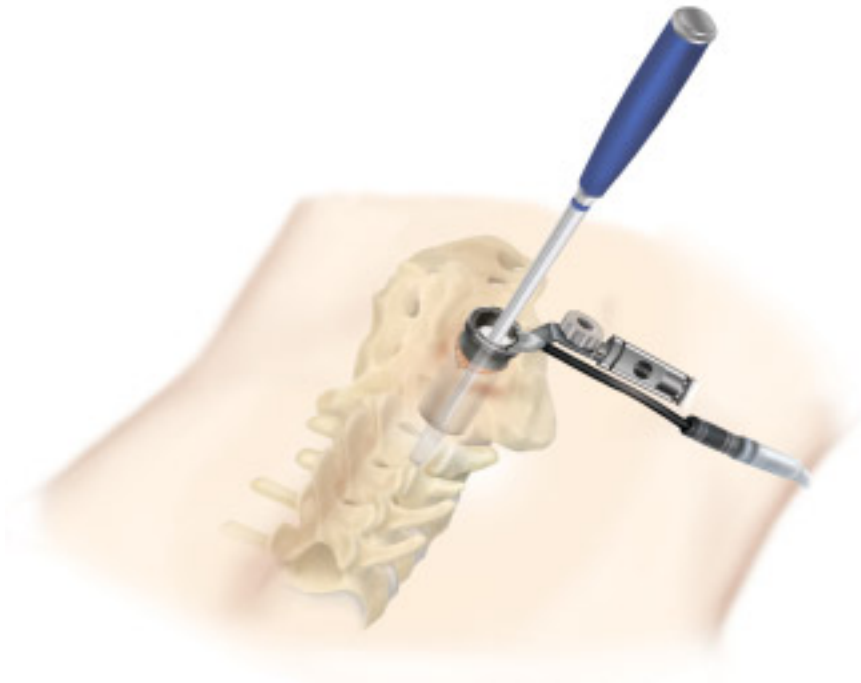


## UNILATERAL MAST TECHNIQUE

## Trial Insertion

UNILATERAL OPEN  
TECHNIQUE

Insert trial until desired disc space height is established. Use A/P and lateral fluoroscopy to confirm proper placement and trajectory.



UNILATERAL OPEN  
TECHNIQUE

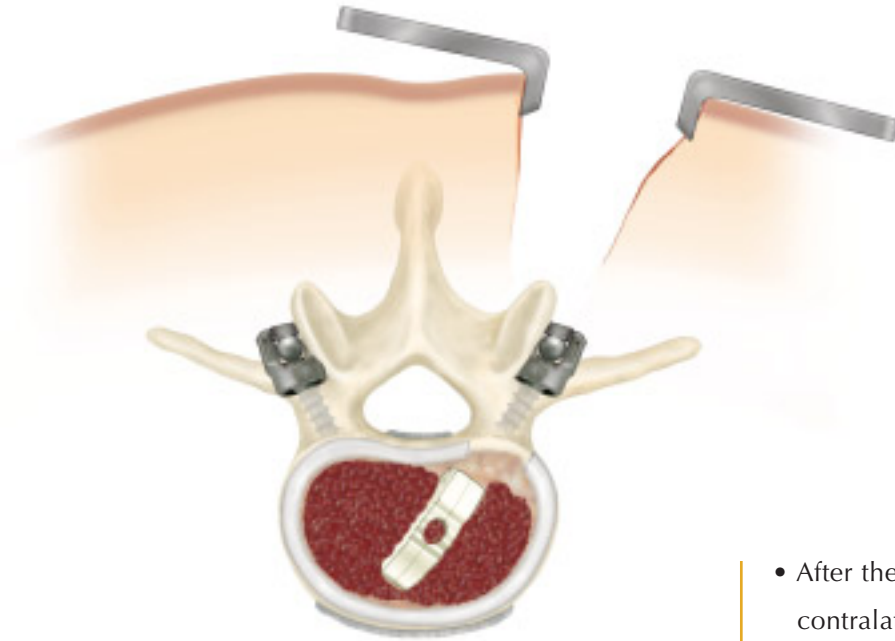
## Insert Construct



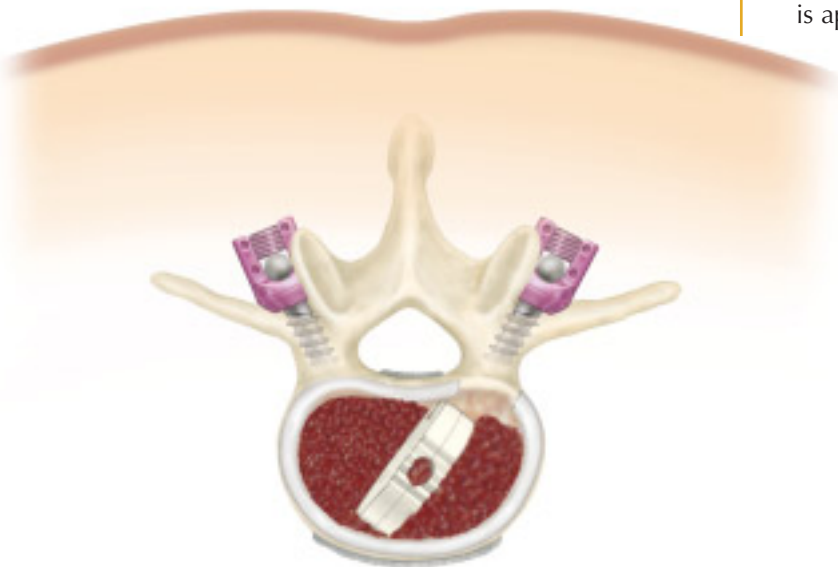
- The appropriate size construct is chosen from the trialing step.
- The appropriate size construct is firmly attached to the inserter.
- Before inserting the construct, place autograft anteriorly and contralaterally or in the bone construct central cavity.
- Gently impact the construct until it is 3 to 4mm below the posterior margin of the annulus.
- Care should be taken to ensure the construct is aligned properly.

UNILATERAL MAST  
TECHNIQUE

## Final Placement

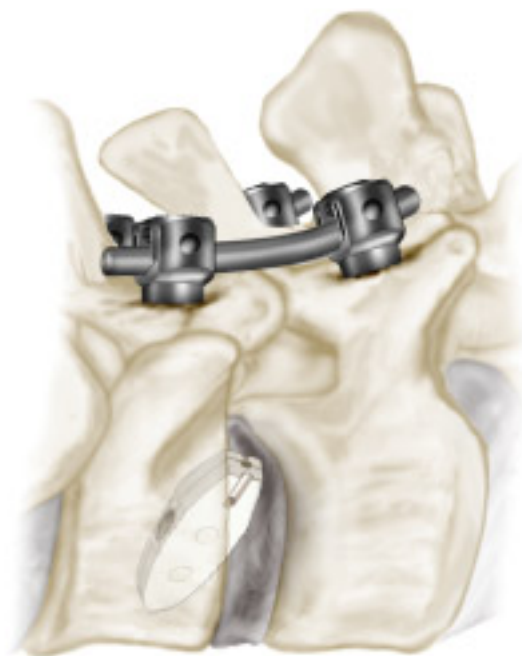
UNILATERAL OPEN  
TECHNIQUE

- After the final construct is placed, the contralateral screw-rod construct is compressed to preload interspace and restore lordosis. The extradural space and foramina are probed to ensure adequate decompression of the neural elements.
- To facilitate satisfactory immobilization of the grafted interspace, segmental internal fixation is applied ipsilaterally using standard technique.



## UNILATERAL OPEN TECHNIQUE

## Additional Fixation Options



CD HORIZON®  
**LEGACY** 5.5™  
SPINAL SYSTEM

CD HORIZON®  
**SEXTANT**™  
ROD INSERTION SYSTEM



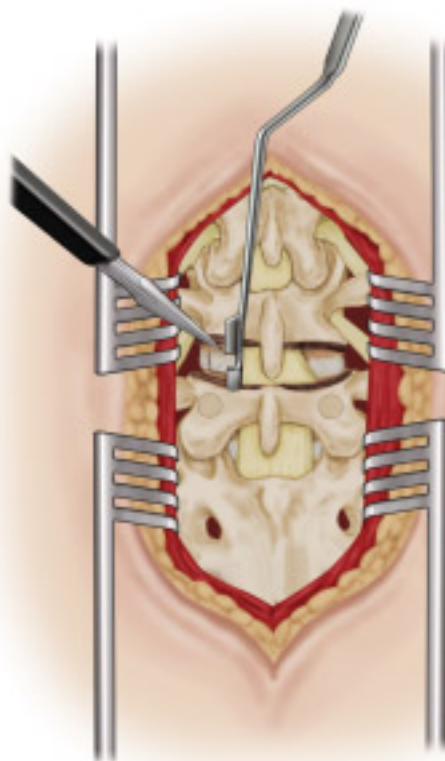
## UNILATERAL MAST TECHNIQUE

# BILATERAL TECHNIQUE

## OPEN AND MAST

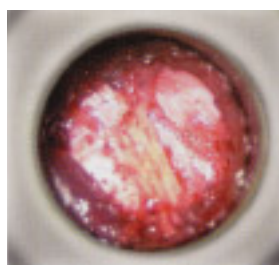
BILATERAL OPEN  
TECHNIQUE

## Laminotomy, Facetectomy and Discectomy

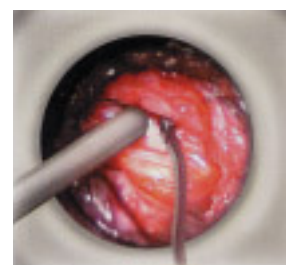
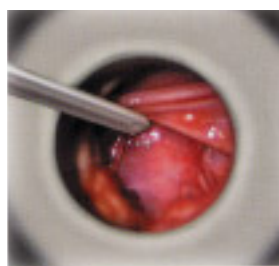


- A conventional discectomy is performed by incising the annulus with a 15-scalpel blade lateral to the dural sac.
- This is done bilaterally and then soft fragments from the intradiscal space or extruded fragments are removed with Disc Rongeurs in a conventional fashion.

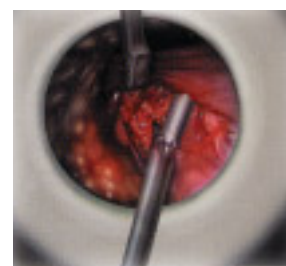
The main goal of this step is to remove extruded fragments, to decompress neural elements, and to provide entry to the disc space for distraction with minimal or no nerve root retraction. If there is significant disc space collapse, a complete discectomy may not be possible until disc space distraction is accomplished.



Soft Tissue Removal

Ligamentum Flavum  
Removal

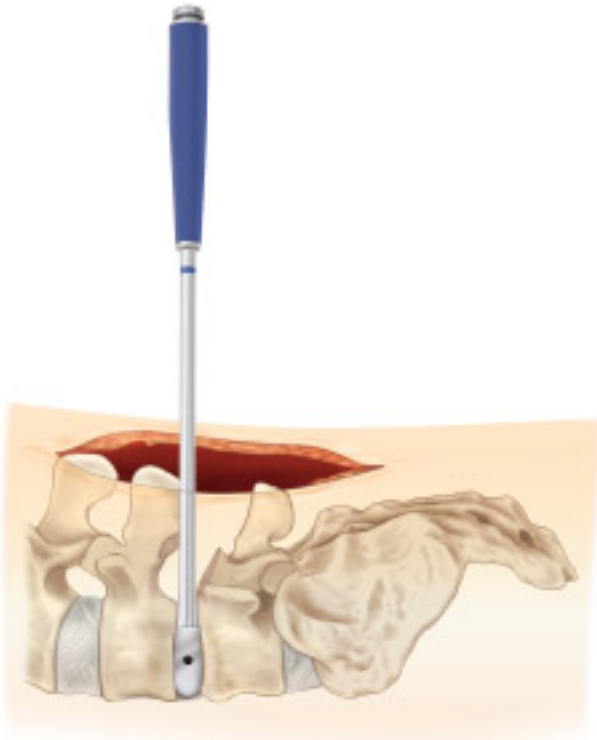
Nerve Root Retraction



Discectomy

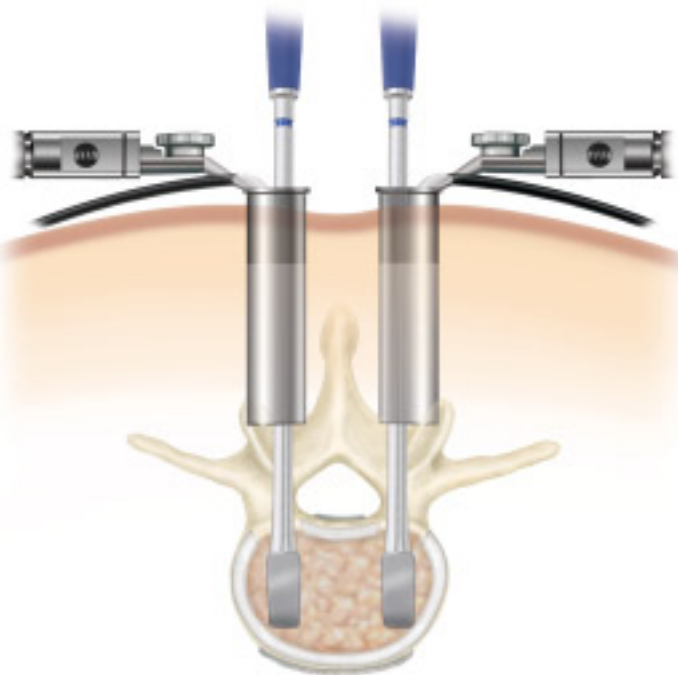
BILATERAL MAST  
TECHNIQUE

## Distraction

BILATERAL OPEN  
TECHNIQUE

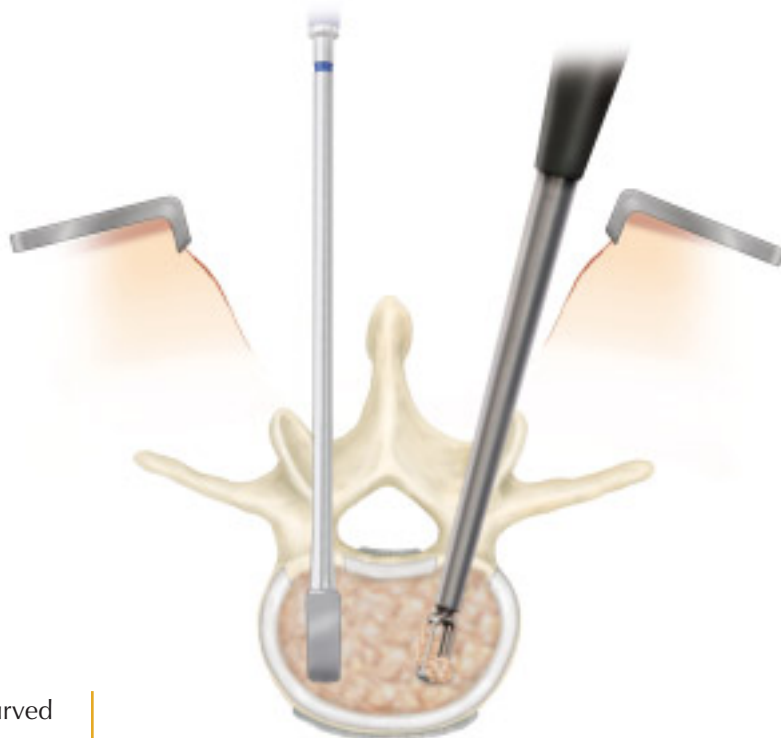
The disc space is sequentially distracted until original disc space height is obtained and normal foraminal opening is restored.

- Insert the Distractors with the curved sides touching the endplates.
- Sequentially insert Distractors until the desired height is obtained.

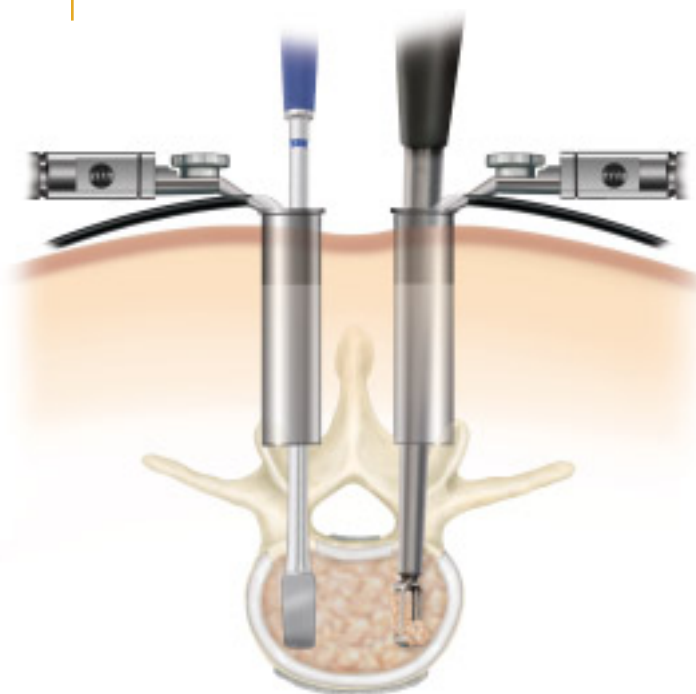


BILATERAL OPEN  
TECHNIQUE

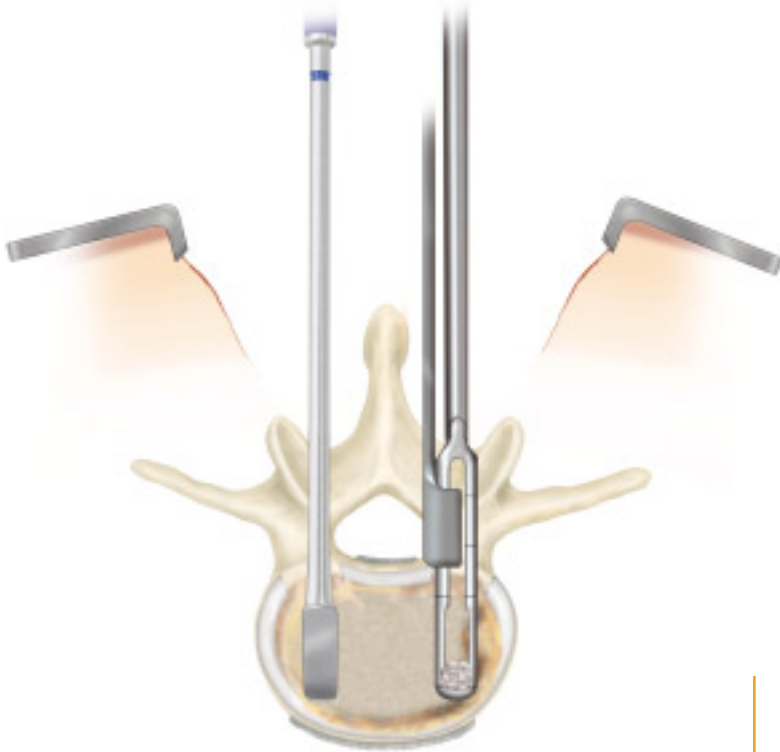
## Disc Space Preparation



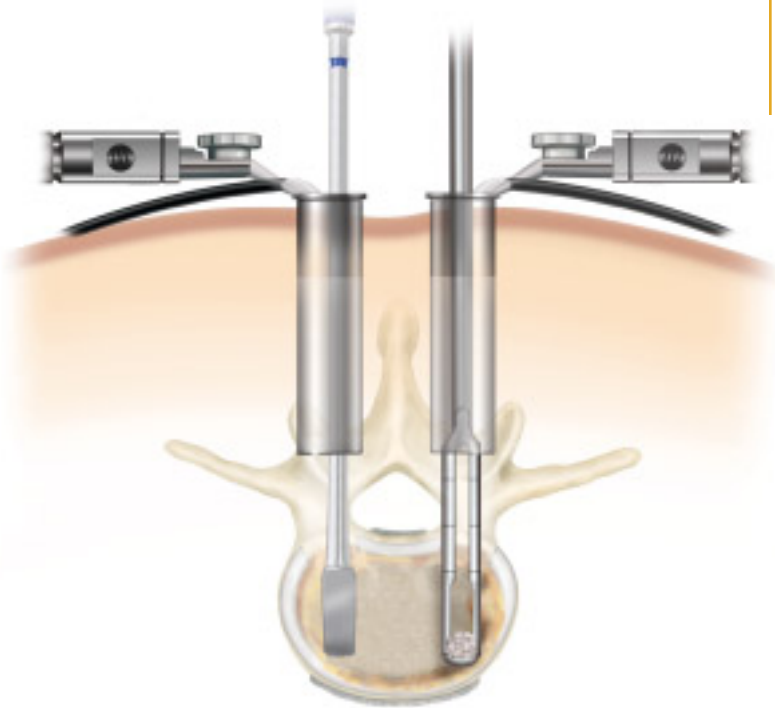
Remove disc using either the Straight or Curved Rotating Cutters. The Rotating Cutters are blunt tipped and side cutting to improve safety. A T-handle or a handheld power drill may be used for more efficient removal of disc.

BILATERAL MAST  
TECHNIQUE

## Endplate Preparation

BILATERAL OPEN  
TECHNIQUE

Remaining soft tissue or cartilaginous endplate is removed with vigorous scraping or curettage. Scrape medially under the midline and gradually work laterally in a sweeping motion until both caudal and cephalad endplates are cleared of soft tissue. The removal of the soft tissue from the endplate surface allows optimal graft incorporation.



## BILATERAL OPEN TECHNIQUE

### Trial Insertion

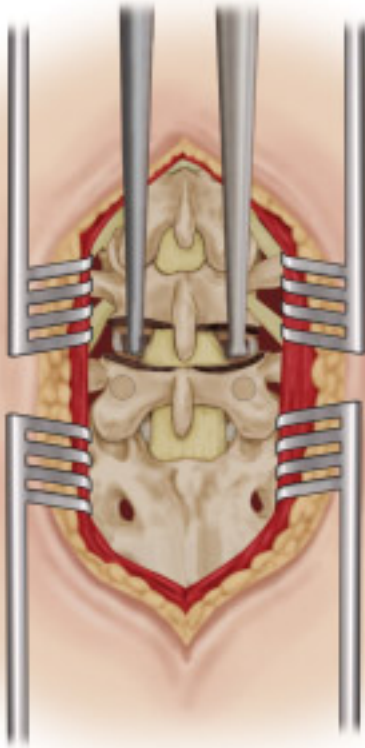
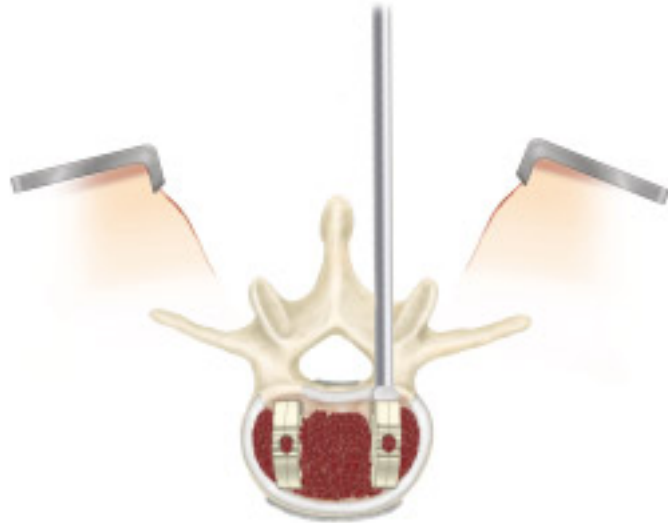


Insert trial until desired disc space height is established.

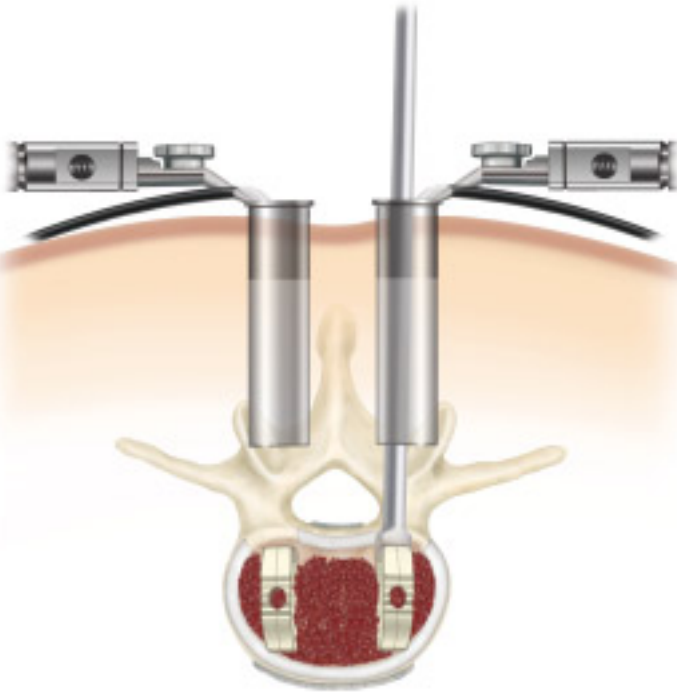


## BILATERAL MAST TECHNIQUE

## Insert Construct

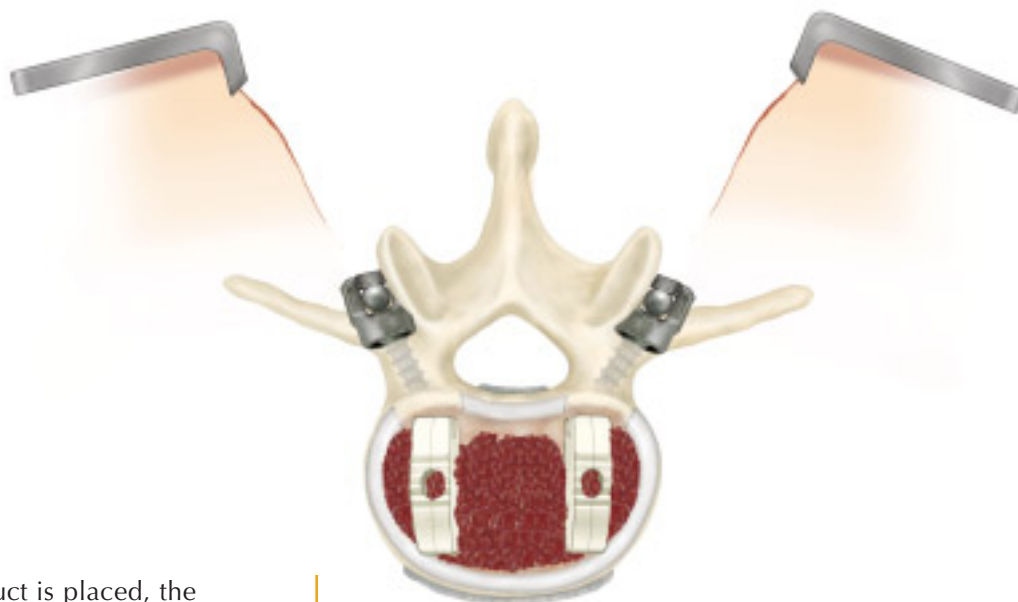
BILATERAL OPEN  
TECHNIQUE

- The appropriate size construct is chosen from the trialing step.
- The appropriate size construct is firmly attached to the inserter.
- Before inserting the construct, place autograft anteriorly.
- Gently impact it until it is 3 to 4mm below the posterior margin of the annulus.
- Care should be taken to ensure the construct is aligned properly.

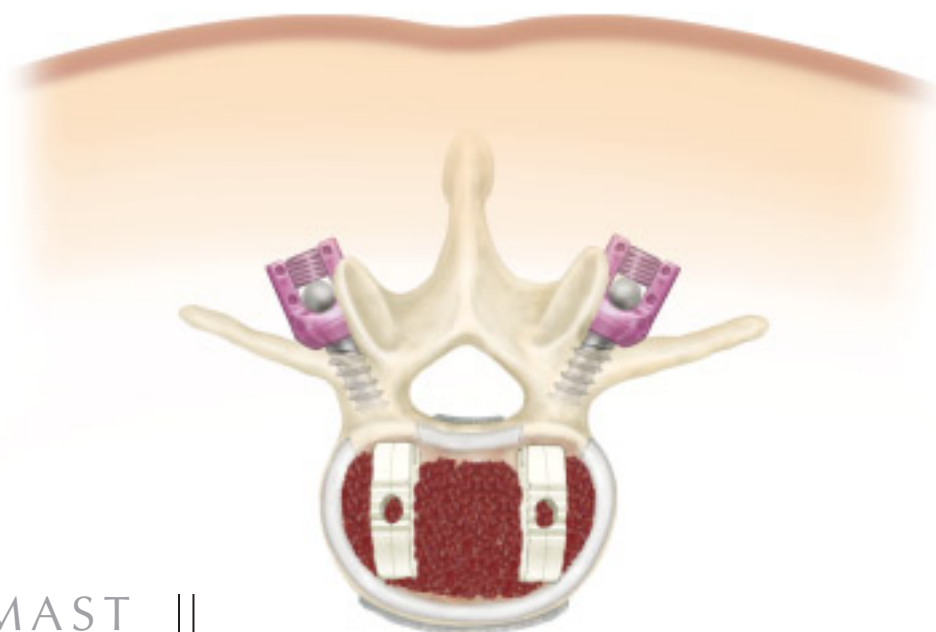


BILATERAL OPEN  
TECHNIQUE

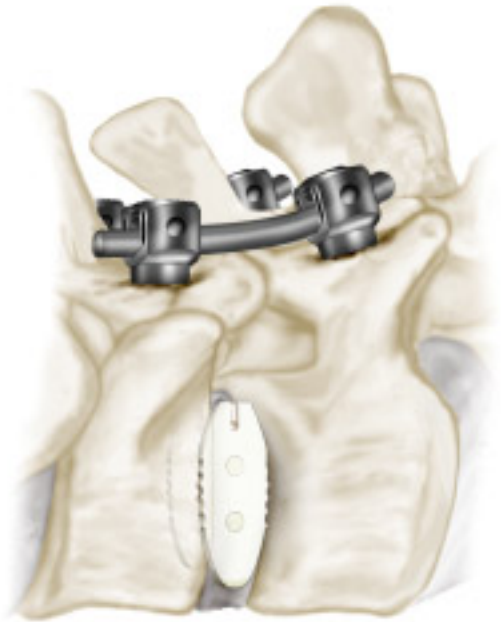
## Final Placement



- After the final construct is placed, the extradural space and foramina are probed to ensure adequate decompression of the neural elements.
- To facilitate satisfactory immobilization of the grafted interspace, segmental internal fixation is applied using standard technique.

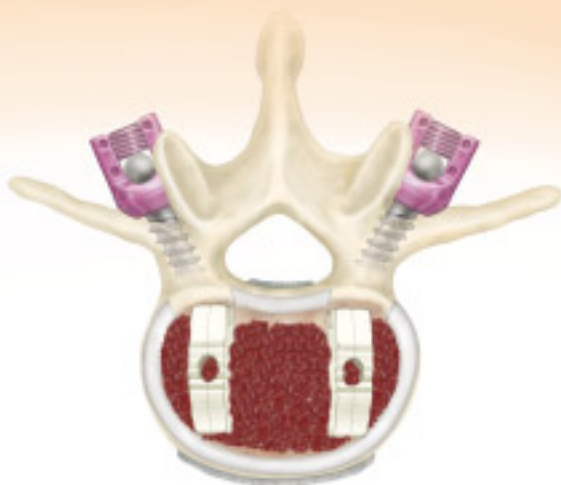
BILATERAL MAST  
TECHNIQUE

## Additional Fixation Options

BILATERAL OPEN  
TECHNIQUE

CD HORIZON®  
**LEGACY** 5.5™  
SPINAL SYSTEM

CD HORIZON®  
**SEXTANT**™  
ROD INSERTION SYSTEM



## Important Information for Medtronic Sofamor Danek Instruments

| CAPSTONE IMPLANTS |                                       |                  |
|-------------------|---------------------------------------|------------------|
| Item Number       | Description                           | Quantity Per Set |
| 2960822           | 8/22mm CAPSTONE VERTE-STACK® PEEK VBS | 2                |
| 2960826           | 8/26mm CAPSTONE VERTE-STACK PEEK VBS  | 2                |
| 2960832           | 8/32mm CAPSTONE VERTE-STACK PEEK VBS  | 2                |
| 2960836           | 8/36mm CAPSTONE VERTE-STACK PEEK VBS  | 2                |
| 2961022           | 10/22mm CAPSTONE VERTE-STACK PEEK VBS | 2                |
| 2961026           | 10/26mm CAPSTONE VERTE-STACK PEEK VBS | 2                |
| 2961032           | 10/32mm CAPSTONE VERTE-STACK PEEK VBS | 2                |
| 2961036           | 10/36mm CAPSTONE VERTE-STACK PEEK VBS | 2                |
| 2961222           | 12/22mm CAPSTONE VERTE-STACK PEEK VBS | 2                |
| 2961226           | 12/26mm CAPSTONE VERTE-STACK PEEK VBS | 2                |
| 2961232           | 12/32mm CAPSTONE VERTE-STACK PEEK VBS | 2                |
| 2961236           | 12/36mm CAPSTONE VERTE-STACK PEEK VBS | 2                |
| 2961422           | 14/22mm CAPSTONE VERTE-STACK PEEK VBS | 2                |
| 2961426           | 14/26mm CAPSTONE VERTE-STACK PEEK VBS | 2                |
| 2961432           | 14/32mm CAPSTONE VERTE-STACK PEEK VBS | 2                |
| 2961436           | 14/36mm CAPSTONE VERTE-STACK PEEK VBS | 2                |
| 4200000           | Peek Implant case                     | 1                |

| CAPSTONE INSTRUMENTS |                           |                  |
|----------------------|---------------------------|------------------|
| Item Number          | Description               | Quantity Per Set |
| 2980100              | Distracting Osteotome 6mm | 1                |
| 2980822              | 08 X 22mm Trial           | 1                |
| 2980826              | 08 X 26mm Trial           | 1                |
| 2981022              | 10 X 22mm Trial           | 1                |
| 2981026              | 10 X 26mm Trial           | 1                |
| 2981222              | 12 X 22mm Trial           | 1                |
| 2981226              | 12 X 26mm Trial           | 1                |
| 2981422              | 14 X 22mm Trial           | 1                |
| 2981426              | 14 X 26mm Trial           | 1                |
| 2980832              | 08 X 32mm Trial           | 1                |
| 2980836              | 08 X 36mm Trial           | 1                |
| 2981032              | 10 X 32mm Trial           | 1                |
| 2981036              | 10 X 36mm Trial           | 1                |
| 2981232              | 12 X 32mm Trial           | 1                |
| 2981236              | 12 X 36mm Trial           | 1                |
| 2981432              | 14 X 32mm Trial           | 1                |
| 2981436              | 14 X 36mm Trial           | 1                |
| 9074002              | Slap Hammer               | 1                |
| 2980001              | Threaded Inserter (PEEK)  | 1                |
| 2980003              | Slap Plate                | 1                |
| 2980004              | Base                      | 1                |
| 2980007              | Lid                       | 1                |
| 2980005              | Tray #1                   | 1                |
| 2980006              | Tray #2                   | 1                |

NOTES



## MEDTRONIC SOFAMOR DANEK EUROPEAN SPINE CENTER

ZAC Paris Nord II – 13, rue de la Perdrix  
BP59302 Tremblay en France  
95940 ROISSY CDG Cedex – FRANCE  
Tel: +33 1 49 38 80 00 Fax: +33 1 49 38 80 01

SOFAMOR SNC  
RCS Bobigny B617 320 486 – NAF 331B

### MEDTRONIC ÖSTERREICH GmbH

Millennium Tower - Handelskai 94 - 96  
1200 VIENNA - AUSTRIA  
Tel: +43 1 240 44 130 Fax: +43 1 240 44 330

### MEDTRONIC BELGIUM

Boechoutlaan 55  
1853 STROMBEEK-BEVER - BELGIUM  
Tel: +32 2 456 09 00 Fax: +32 2 460 26 67

### MEDTRONIC B.V.

Trg Drazena Petrovica 3/V  
10 000 ZAGREB - CROATIA  
Tel: +385 1 48 81 120 Fax: +385 1 48 44 060

### MEDTRONIC CZECHIA s.r.o.

Sokolovska 77 - 79  
186 PRAGUE 8 - CZECH REPUBLIC  
Tel: +420 2 9657 9580 Fax: +420 385 1 9657 9589

### MEDTRONIC-VICARE A/S

Birkeroed Kongevej 150B  
3460 BIRKEROED - DENMARK  
Tel: +45 45 82 33 66 Fax: +45 45 82 33 65

### MEDTRONIC FINLAND LTD.

Sahaajankatu 24  
P.O. Box 230  
00811 HELSINKI - FINLAND  
Tel: +35 8 97 55 25 011 Fax: +35 8 97 75 52 50 18

### MEDTRONIC FRANCE SAS

122, avenue du Général Leclerc  
92514 BOULOGNE BILLANCOURT CEDEX - FRANCE  
Tel: +33 1 55 38 17 00 Fax: +33 1 55 38 18 00

### MEDTRONIC GmbH

Emanuel-Leutze-Str. 20  
40547 DÜSSELDORF - GERMANY  
Tel: +49 211 52 93 0 Fax: +49 211 52 93 302

### MEDTRONIC HELLAS S.A.

5, Ag Varvaras Str.  
GR15231 HALANDRI, ATHENS - GREECE  
Tel: +30 1 06779099 Fax: +30 1 06779399

### MEDTRONIC HUNGARIA Kft.

Alkotás Point  
Alkotás U. 50  
H-1123 BUDAPEST - HUNGARY  
Tel: +36 1 889 0600 Fax: +36 1 889 0699

### MEDTRONIC ISRAEL

World Trade Center  
41, Hameyasdim St.  
40500 EVEN YEHUDA - ISRAEL  
Tel: +972 9 891 22 23 Fax: +972 9 891 93 20

### MEDTRONIC ITALIA S.p.A.

Piazza Indro Montanelli, 30  
20099 SESTO SAN GIOVANNI (MI) - ITALY  
Tel: +39 02 241371 Fax: +39 02 24138 223

### MEDTRONIC MEDITERRANEAN S.A.L

Regional Development Center (RDC)  
St. Charles City Center 6th Floor  
Omar Daouk Street - P.O. Box 13.6572  
2020-0908 BEIRUT - LEBANON  
Tel: +961 1 370670 Fax: +961 1 369655

### MEDTRONIC NETHERLANDS

Earl Bakkenstraat 10  
6422 PJ HEERLEN - THE NETHERLANDS  
Tel: +31 45 566 83 62 Fax: +31 45 566 83 63

### MEDTRONIC VINGMED AS

Fjordvn. 1. P.O. Box 366  
1323 HOEVIK - NORWAY  
Tel: +47 67580680 Fax: +47 67101212

### MEDTRONIC POLAND Sp. Z.o.o.

Ul. Ostrobramska 101  
04-041 WARSZAWA - POLAND  
Tel: +48 22 465 69 00 Fax: +48 22 465 69 17

### MEDTRONIC PORTUGAL

Rua Tomas Da Fonseca, Torre E - 8º  
1600-209 LISBOA - PORTUGAL  
Tel: +351 21 724 51 00 Fax: +351 21 724 51 99

### MEDTRONIC SOUTH AFRICA

1 Eastgate Lane, Bedfordview  
JOHANNESBURG 2047 - REPUBLIC OF SOUTH AFRICA  
Tel: +27 11 677 4800 Fax: +27 11 616 1104

### MEDTRONIC IBERICA S.A

C/Calendula, 93 - Edificio «Medtronic G»  
El soto de la Moraleja - Alcobendas  
28109 ALCOBENDAS (MADRID) - SPAIN  
Tel: +34 916 250 500 Fax: +34 916 250 580

### MEDTRONIC SWEDEN AB

Box 265  
17725 JARFALLA - SWEDEN  
Tel: +46 8 52 22 00 00 Fax: +46 8 52 22 00 50

### MEDTRONIC SCHWEIZ AG

MEDTRONIC EUROPE  
Route du Molliat, 31 - Case Postale  
CH1131 TOLOCHENAZ - SWITZERLAND  
Tel: +41 21 803 8000 Fax: +41 21 803 8099

### MEDTRONIC LTD

Suite one - Sherbourne House - Croxley Business Center  
WD1 8YE WATFORD - UNITED KINGDOM  
Tel: +44 192 321 22 13 Fax: +44 192 324 10 04



**Medtronic**  
SOFAMOR DANEK