

# VEO<sup>®</sup>

## Lateral Access and Interbody Fusion System





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**VEO**®

Lateral Access and Interbody  
Fusion System

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## Step 1: Patient Positioning & Operating Room Setup

- Place the patient in a lateral decubitus position on a radiolucent breaking table.
- Stabilize and secure the patient to the table (Fig. 1) with surgical tape in the following places:
  - A. Just below the iliac crest
  - B. Over the thoracic region
  - C. From the iliac crest to the knee, then secured to the table
  - D. From the table to the knee, past the ankle, then secured back to the table



Figure 1

**NOTE:** When targeting the L1/L2 or L2/L3 disc space, the table break should be placed above the iliac crest. When targeting the L3/L4 or L4/L5, the table break should be placed at the iliac crest.

## Step 2: Anatomy Identification & Marking

- Obtain true A/P and lateral images of the targeted disc (Fig. 2 & 3).



Figure 2



Figure 3

**NOTE:** Adjust the patient's position, taking into account spinal pathology and spinal positioning, so that lateral images can be taken with the c-arm positioned at approximately 90°. The exact position of the c-arm should be noted for subsequent imaging.

- Locate the middle of the targeted disc space and draw an anterior-to-posterior line on the skin (Fig. 4) to represent the centerline of the disc space.
- Add hash marks to the anterior-to-posterior line to indicate the front, back, and midline of the disc space.

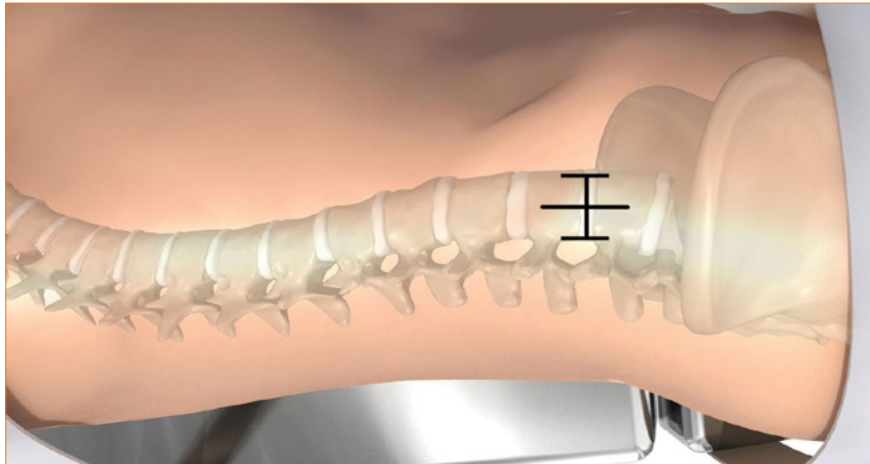


Figure 4

- Fixate the radial table clamp (Fig. 5) to the bed rail on the anterior side of the patient prior to draping.
- Drape and prepare the surgical site in typical fashion.
- Attach the table mounted **Retractor Arm (V070-0017)** (Fig. 6) to the table after the patient is draped.



Figure 5



Figure 6

**NOTE:** X-Y Mount is available upon request through Sales Support.

## Step 3: Access

- Make a 35-40mm anterior-to-posterior incision over the center marking of the disc space.
- Using finger or blunt dissection, open the incision down to the fascia over the external oblique muscles (Fig. 7).
- Incise fascia in line with the muscle fibers.
- Continue blunt or finger dissection through the muscle layers in the retroperitoneal space to the psoas muscle.

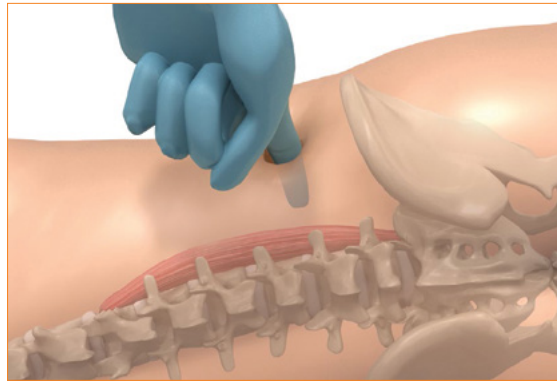


Figure 7

**NOTE:** A transverse, vertical, or oblique skin incision can be made depending on preference.

- Dissect carefully to avoid perforation of the peritoneum.
- If possible, palpate the psoas muscle with finger.

## Step 4: Dilation

- Insert **Dilator 1 (V070-0006)** into the incision and advance it down to the surface of the psoas muscle.
- Dilate the soft tissue with **Dilator 2 (V070-0007)** by placing it over **Dilator 1** (Fig. 8) and working it down the incision to the surface of the psoas muscle.
- Confirm placement of the tip of the dilators with a lateral and A/P fluoroscopic image, if desired.
- Use the three markings (100mm, 120mm, and 140mm) on the side of **Dilator 2** to select the appropriate length **Cannula (V070-0030, V070-0031, V070-0032)**.
- The value of the marking (100mm, 120mm, and 140mm) closest to the skin corresponds to the length of the **Cannula** that should be selected.

**NOTE:**

- Dilator 2 should rest on the surface of the psoas muscle.
- The flat side of Dilator 2 should be orientated to face cephalad/caudal.
- Dilator 1 & 2 can be snap-fitted together to create one solid dilator.



Figure 8

## Step 5: Cannula Insertion

- Insert the selected **Cannula** over **Dilator 2 (Fig. 9)** and advance it down to the psoas muscle with the connecting arm pointing toward the table mounted retractor arm (Fig. 9).
- Secure the **Cannula** with the **Table Mounted Retractor Arm**.
- Remove **Dilators 1 & 2** from the **Cannula**.
- Take a lateral fluoroscopic image to confirm placement of the **Cannula**.
- The **Cannula** should be centered over the targeted disc space. If it is not centered, adjust the **Cannula** so that it is directly over the disc space.
- Plug the fiber optic cable into a light source (see manufacturer's instructions for light source).
- Attach the stadium mount light to the fiber optic cable.
- Attach the stadium mount light to the **Cannula** (Fig. 10) and visualize the surface of the psoas muscle.
- While visualizing the psoas muscle and associated nerves, the surgeon may opt to utilize the neuroprobe (see manufacturer's instructions).

### NOTE:

- *The top of the Cannula offers four separate places to attach the stadium mount light.*
- *A Frazier Suction Tube (22-0552) is provided in the VEO access tray.*
- *Neuromonitoring is not required to be performed with the VEO procedure, but can be done so under the discretion of the surgeon. Neuromonitoring instruments and equipment must be used within the confines of their respective labeling.*



Figure 9



Figure 10

- Using direct visualization, gently split the psoas muscle using the penfield dissector or cobb dissector (Fig. 11) identifying and protecting nerves as needed.
- Markings on the **Cobb and Penfield Dissectors (Straight 22-0525 or Angled 22-0524)** may be used to measure the depth to the disc space in order to choose the appropriate psoas **Retractor Blades (20-3301-02 - 20-3301-10) (120mm-200mm)** (Fig. 12).
- Gently insert a **90° Nerve Retractor (20-2582)** (Fig. 13) alongside the dissector to maintain the psoas muscle split.
- Insert the **K-wire (KI-71-164)** through the split 5-10mm into the disc space.
- Remove the **90° Nerve Retractor** from the incision.

**NOTE:**

- *K-WIRE, SINGLE TROCAR .054 X 12*
- *Take a lateral image to verify that the K-wire is in the center (anterior to posterior) of the disc space.*
- *Take an A/P fluoroscopic image and verify the Cannula is centered over the K-wire.*
- *Carefully remove the K-wire.*
- *If needed, loosen the Table Mounted Retractor arm and adjust the Cannula.*

**NOTE:** The use of the 90° nerve retractor is optional. A penfield or cobb dissector may also be used.



Figure 11

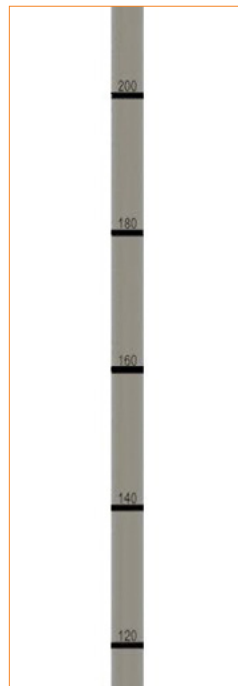


Figure 12



Figure 13



## Step 6: Psoas Blade Insertion

- Insert a **90° Nerve Retractor** through the split and retract the psoas muscle posteriorly (Fig. 14).
- Choose the length of the psoas retractor blade based on graduations from the **90° Nerve Retractor** or Cobb/Penfield, and attach the **VEO Psoas Retractor Handle (V070-0049)** to the corresponding **Psoas Retractor Blade (20-3301-02 - 20-3301-10)** by sliding it firmly into the slot on the blade (Fig. 15).
- Insert the first **Psoas Retractor Blade** through the split and retract the psoas muscle anteriorly.
- While the psoas muscle is retracted, maintain contact with the annulus and vertebral body.
- Insert the **Inner Half Sleeve (V070-0009)** into the cannula to secure the psoas retractor blade (Fig. 16 and Fig. 17).



Figure 14



Figure 15



Figure 16



Figure 17

- Maintain gentle downward pressure on the psoas **Retractor Blade** and remove the **90° Nerve Retractor** (Fig. 18).
- Use a second psoas **Retractor Blade** to retract the psoas posteriorly while maintaining the tip of the retractor in contact with the annulus (Fig. 19 & 20).
- Insert a second **Inner Half Sleeve** into the **Cannula** to secure the **Psoas Retractor Blade** (Fig. 21).
- Take an A/P and a lateral fluoroscopic image to confirm **Psoas Retractor Blade** placement.
- Remove the blade handles (Fig. 22).



Figure 18



Figure 19



Figure 20



Figure 21



Figure 22



Figure 23

**NOTE:** The U-Shaped Inner Sleeve (V070-0016) can also be used to retract both blades at the same time (Fig. 23)

## Step 7: Discectomy & Endplate Preparation

- Incise the annulus and perform an annulotomy with a scalpel or bovie.
- Use a rongeur or other instrumentation to start the discectomy.
- Connect the **Paddle Shaver (7mm - 14mm) (V070-0101 - V070-0107)** to the quick-connect **T-handle (V070-0100)** by pulling the **T-handle** collar up toward the handle (Fig. 24). With the collar up, insert the shaver and release the collar. Ensure the instrument is fully seated before use by gently pulling down on it.
- Under A/P fluoroscopy, insert a **Paddle Shaver** or **Cobb Elevator (V070-0020 - V070-0021 - V070-0022)** across the disc space, parallel to the endplates.
- Gently release the contralateral annulus.
- Perform the discectomy and endplate preparation. A variety of instruments, which includes **Cup Curettes, Ring Curettes, Rongeurs, Osteotomes, Rasps** or other appropriate discectomy tools, may be used (Fig. 25).
- Use the laser etched lines along with the green, yellow, and red markings to maintain consistent depth throughout the procedure.



Figure 24

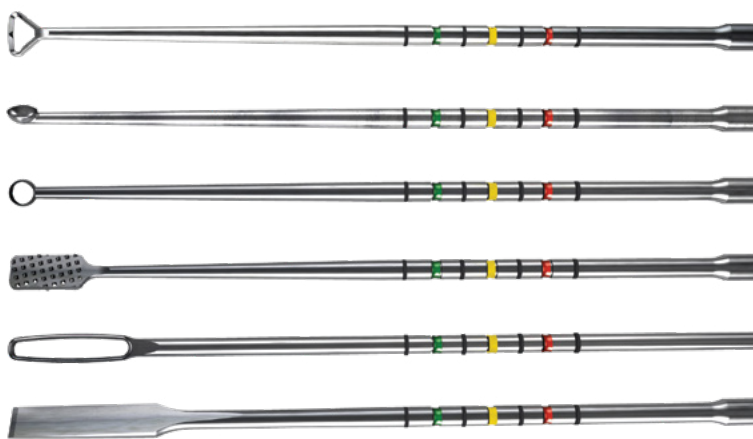


Figure 25



Figure 26

### NOTE:

- Take care when passing sharp instrumentation through the psoas muscle.
- Discectomy and endplate preparation surgical technique will vary by surgeon.
- Paddle Shavers may also be used to determine the approximate disc height and length for trial and cage placement. The holes in the shaver demarcate disc length starting at the distal end at 40mm and increase by 5mm to 60mm (Fig. 26).

## Step 8: Implant Measurement

- **Interbody Trials** are available to measure the height, angle, width, and length of the disc space so the appropriate interbody cage can be selected.
- Insert the **Interbody Trial** into the disc space.
- Using a **Mallet (Y070-0036)** as needed, gently advance the interbody trial into the disc space until the tip of the interbody trial is at the contralateral edge of the vertebral body.
- Take a lateral fluoroscopic image to confirm placement of the **Interbody Trial**.
- The **Interbody Trials** contain grooves and holes to fluoroscopically determine the length of the disc space (Fig. 27). The groove and hole closest to the tip denotes the length of a 40mm long interbody cage. The remaining grooves are 10mm apart and denote the available lengths of interbody cages up to 60mm in length.
- Attach the reverse **Slap Hammer (V070-0004)** by sliding the catch of the reverse **Slap Hammer** under the quick-connect of the **Interbody Trial**, and then remove the **Interbody Trial**.

**NOTE:** When using the lordotic **Interbody Trials**, ensure they are inserted properly by utilizing the markings with the "A" mark facing anterior and the "P" mark facing posterior.

## Step 9: VEO Interbody Cage Insertion

- Select the desired interbody cage.
- Rotate the **VEO Inserter (V070-0002)** knob counterclockwise and place the inserter collar in the unlocked position (Fig. 28).
- Place the interbody cage on the **Inserter** and rotate the **Inserter** collar into the locked position (Fig. 29).
- Rotate the **Inserter** knob clockwise until the interbody cage is secured (Fig. 30).
- Pack graft material into the graft window of the interbody cage and insert into the disc space.
- Take A/P and lateral fluoroscopic images to verify placement prior to releasing the cage inserter from the interbody cage.
- To release the interbody cage from the **Inserter**, rotate the **Inserter** knob counterclockwise until it stops.
- Rotate the **Inserter** collar to the unlocked position and rotate the **Inserter** knob clockwise until it stops while in the unlocked position, then remove the **Inserter**.



Figure 27



Figure 28



Figure 29



Figure 30

## Step 10: Psoas Retractor Removal

- Remove each **Inner Half Sleeve** or the **U-Shaped Inner Sleeve** then remove each **Psoas Retractor Blade** from the surgical site.
- Release the connection between the **Table Mounted Retractor Arm** and **Cannula** by turning the wing nut counter-clockwise.
- Remove the **Cannula** from the incision.

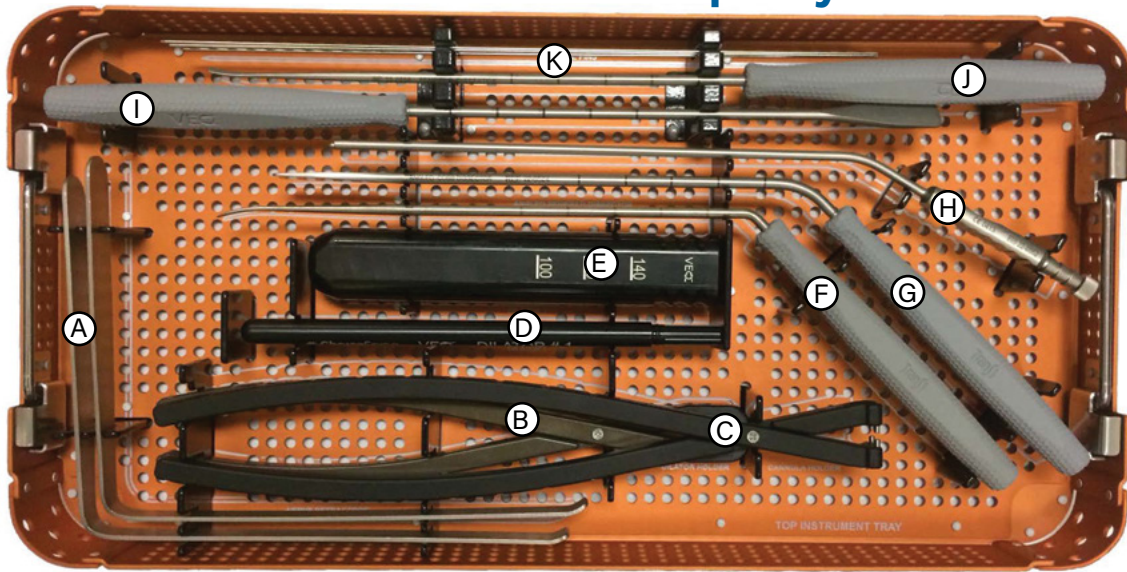
### NOTE:

- VEO is designed to be used with supplemental fixation that is cleared for use in the lumbar spine.
- VEO is designed to be used with autogenous graft.

## Step 11: Closure

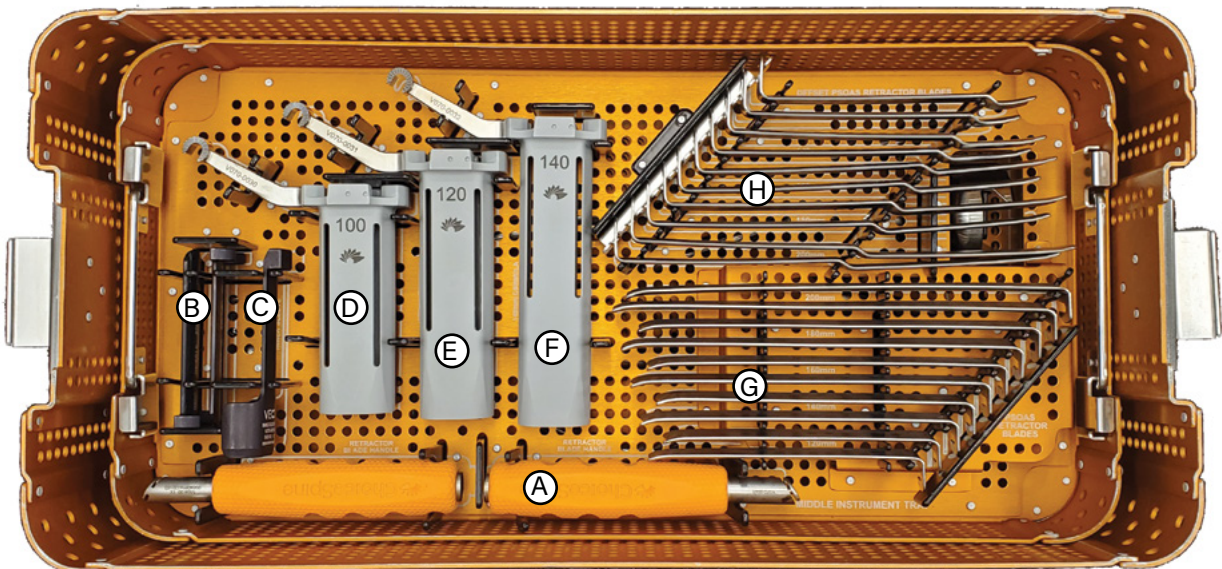
- Obtain final A/P and lateral images.
- Close the incision in the typical fashion.

## VEO Access: Top Tray



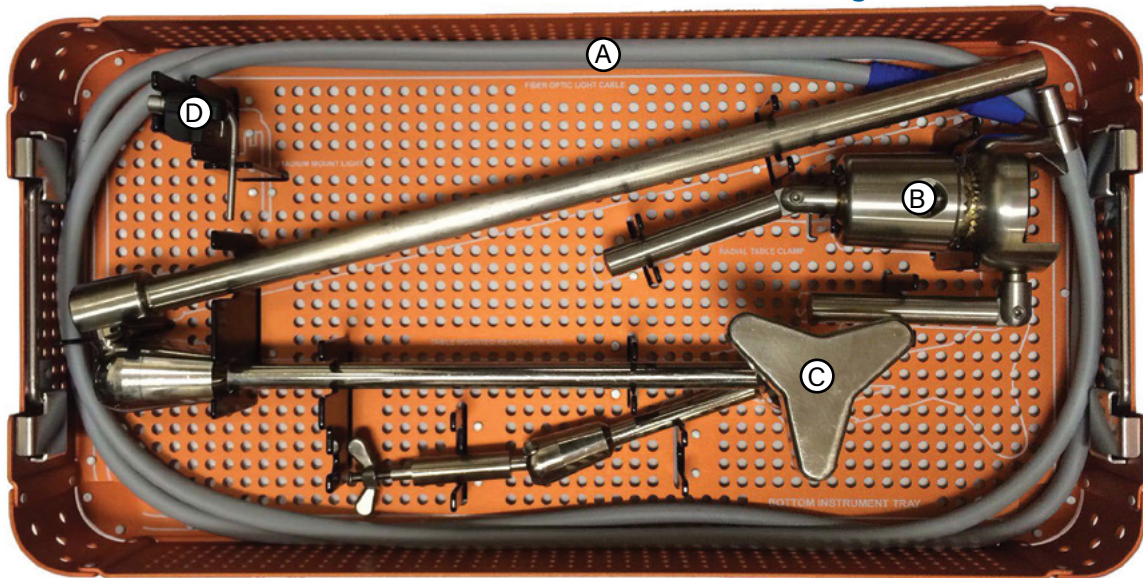
- Ⓐ 90° Nerve Retractor 20-2582
- Ⓑ Dilator Holder 22-0471
- Ⓒ Cannula Holder 28-0100
- Ⓓ Dilator 1 V070-0006
- Ⓔ Dilator 2 V070-0007
- Ⓕ Angled Pennfield Dissector 22-0556
- Ⓖ Angled Cobb Dissector 22-0524
- Ⓗ Frazier Suction Tube 22-0552
- Ⓘ Straight Cobb Dissector 22-0525
- ⓵ Straight Penfield Dissector 22-0555
- Ⓚ K-wires KI-71-164

## VEO Access: Middle Tray



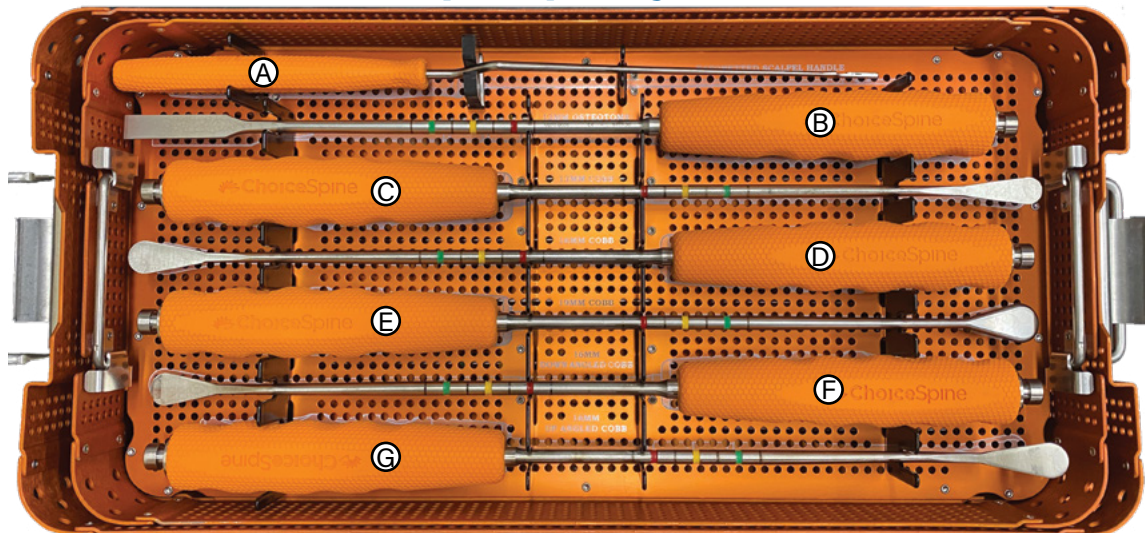
- Ⓐ Retractor Blade Handles V070-0049
- Ⓑ Inner Half Sleeves V070-0009
- Ⓒ U-Shaped Inner Sleeve V070-0016
- Ⓓ 100mm Cannula V070-0030
- Ⓔ 120mm Cannula V070-0031
- Ⓕ 140mm Cannula V070-0032
- Ⓖ Psoas Retractor Blades 120mm through 200mm 20-3301-02 - 20-3301-10
- Ⓗ Offset Psoas Retractor Blades 120mm through 200mm CMP-06541-02 - CMP-06541-10

## VEO Access: Bottom Tray



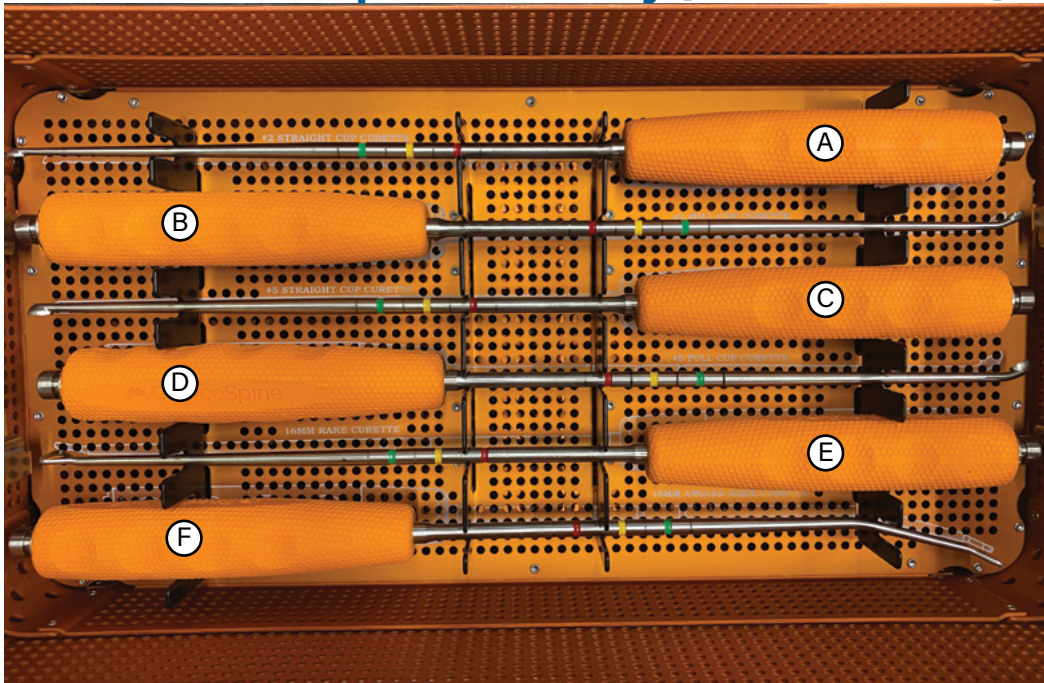
- Ⓐ **Fiber Optic Cable 22-0553**
- Ⓑ **Radial Table Clamp 21-0566**
- Ⓒ **Table Mounted Retractor Arm V070-0017**
- Ⓓ **Stadium Mount Light V070-0019**

## VEO Disc Prep: Top Tray (ALDP Case #1)



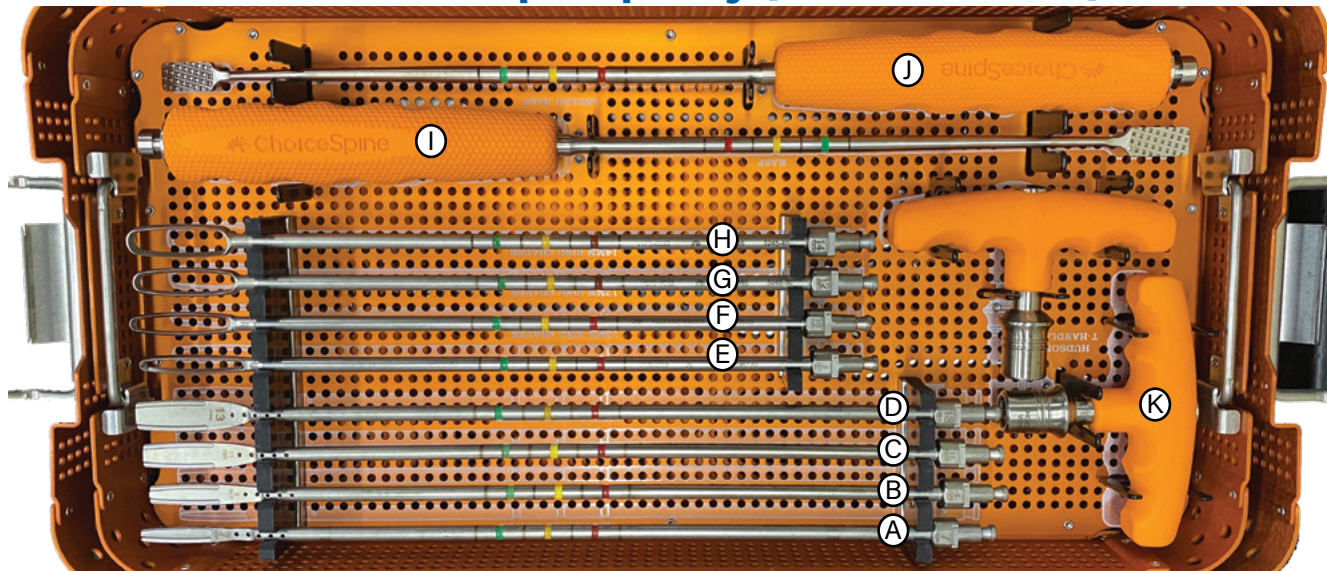
- Ⓐ **Bayoneted Scalpel Holder V070-0035**
- Ⓑ **12mm Osteotome V070-0005**
- Ⓒ **13mm Cobb V070-0020**
- Ⓓ **16mm Cobb V070-0021**
- Ⓔ **19mm Cobb V070-0022**
- Ⓕ **16mm Cobb, Angled Down V070-0024**
- Ⓖ **16mm Cobb, Angled Up V070-0027**

## VEO Disc Prep: Bottom Tray (ALDP Case #1)



- (A) Cup Curette, #2 Straight V070-0050
- (B) Cup Curette, #2 Pull V070-0052
- (C) Cup Curette, #5 Straight V070-0051
- (D) Cup Curette, #5 Pull V070-0053
- (E) Rake Curette, 16mm V070-0011
- (F) Angled Rake Curette, 16mm V070-0013

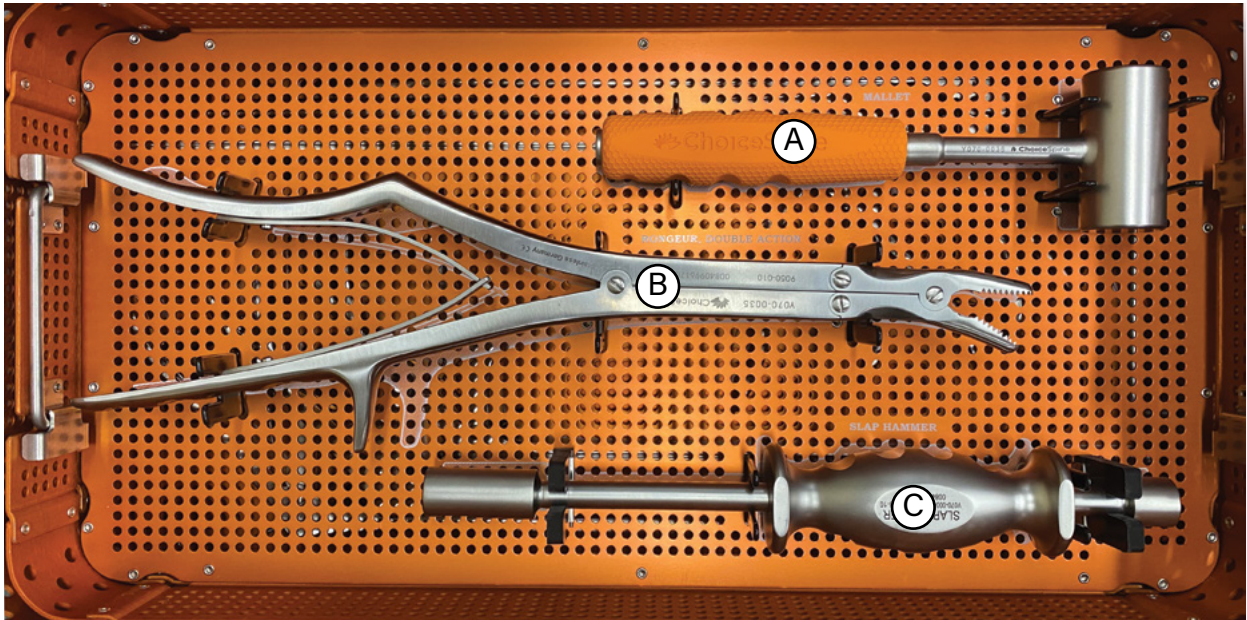
## VEO Disc Prep: Top Tray (ALDP Case #2)



- (A) Paddle Shaver, 7mm V070-0101
- (B) Paddle Shaver, 9mm V070-0103
- (C) Paddle Shaver, 11mm V070-0105
- (D) Paddle Shaver, 13mm V070-0107
- (E) Ring Shaver, 8mm V070-0090
- (F) Ring Shaver, 10mm V070-0091
- (G) Ring Shaver, 12mm V070-0092
- (H) Ring Shaver, 14mm V070-0093
- (I) Rasp V070-0040
- (J) Angled Rasp V070-0041
- (K) T-Handle (x2) V070-0100

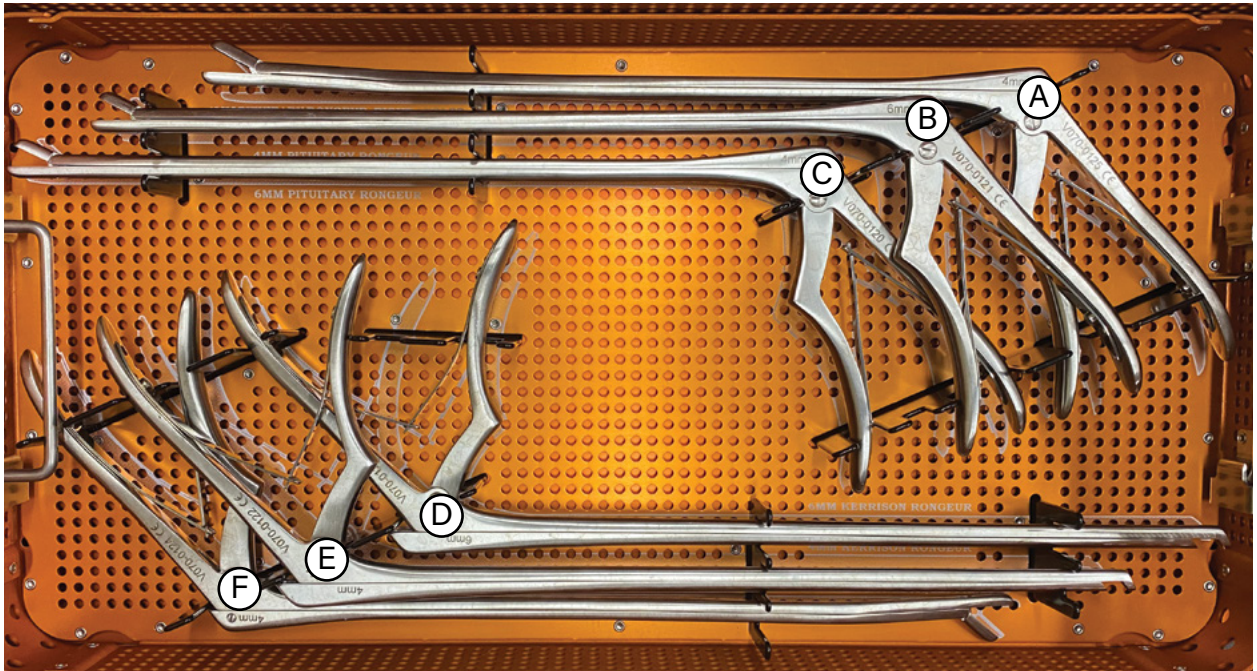


## VEO Disc Prep: Middle Tray (ALDP Case #2)



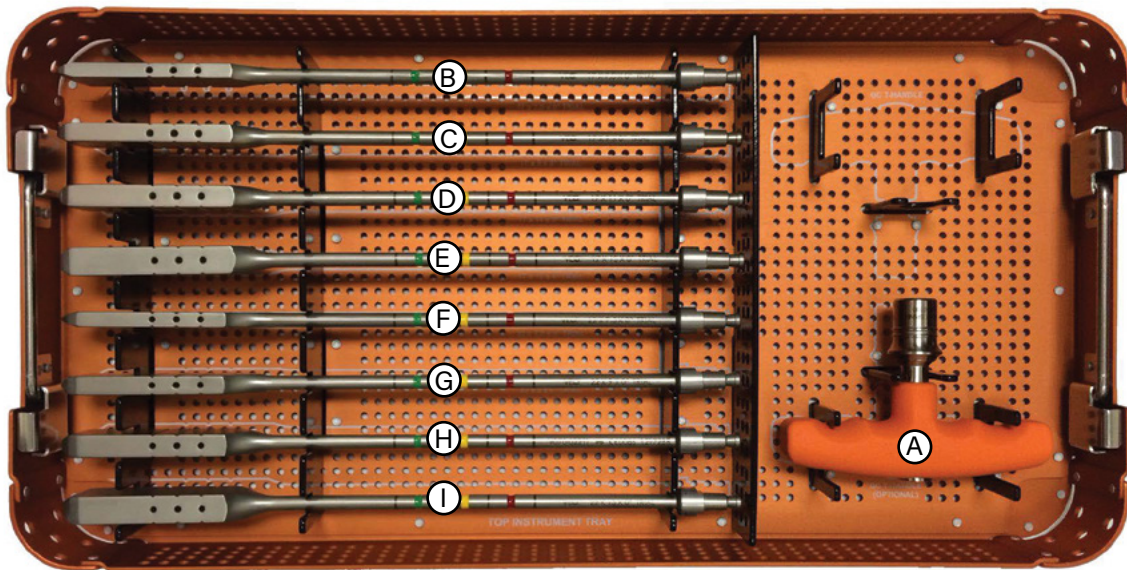
- (A) Mallet Y070-0036
- (B) Rongeur, Double Action Y070-0035
- (C) Slap Hammer V070-0004

## VEO Disc Prep: Bottom Tray (ALDP Case #2)



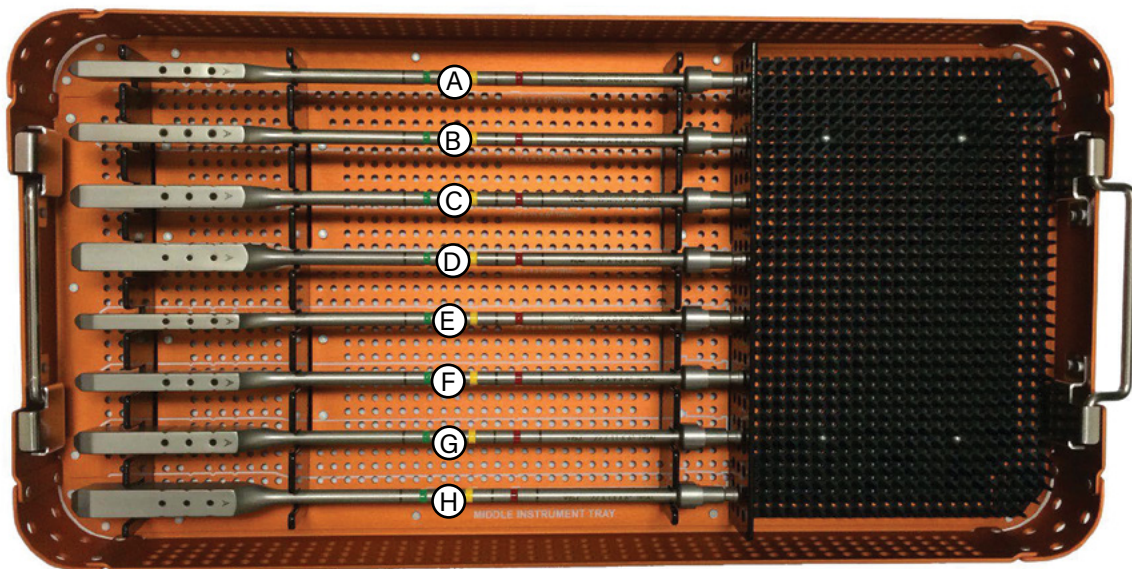
- (A) 4mm Pituitary Rongeur, Right Angled V070-0124
- (B) 4mm Pituitary Rongeur V070-0120
- (C) 6mm Pituitary Rongeur V070-0121
- (D) 6mm Kerrison Rongeur V070-0123
- (E) 4mm Kerrison Rongeur V070-0122
- (F) 4mm Pituitary Rongeur, Left Angled V070-0125

## VEO Trial: Top Tray



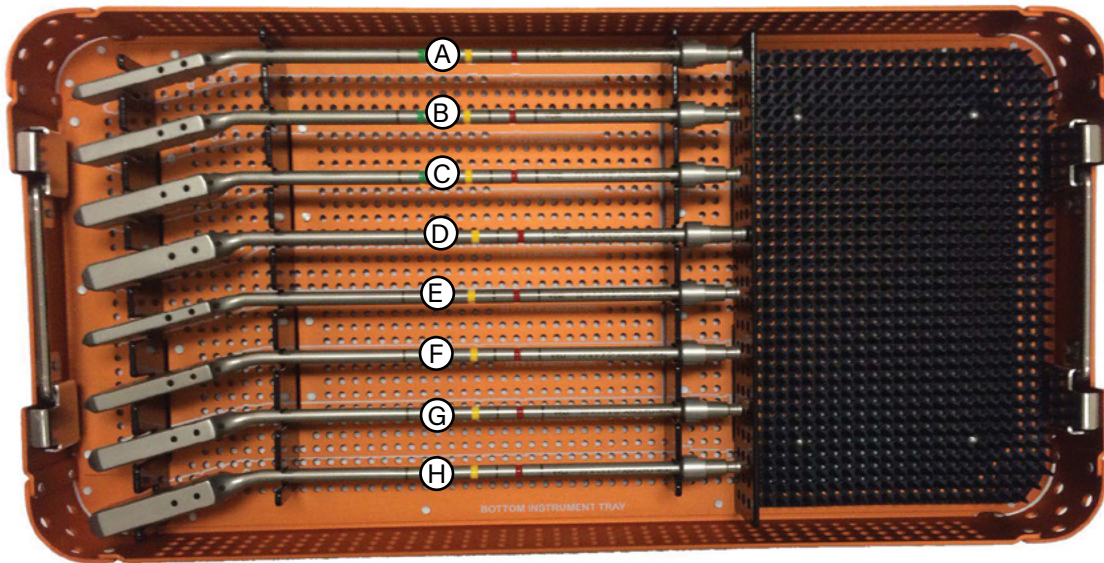
- |  |  |
|--|--|
| (A) Hudson T-Handle V070-0100          | (F) 22mm x 7.5mm x 0° Trial V070-02275 |
| (B) 17mm x 7.5mm x 0° Trial V070-01775 | (G) 22mm x 9mm x 0° Trial V070-02209   |
| (C) 17mm x 9mm x 0° Trial V070-01709   | (H) 22mm x 11mm x 0° Trial V070-02211  |
| (D) 17mm x 11mm x 0° Trial V070-01711  | (I) 22mm x 13mm x 0° Trial V070-02213  |
| (E) 17mm x 13mm x 0° Trial V070-01713  |  |

## VEO Trial: Middle Tray



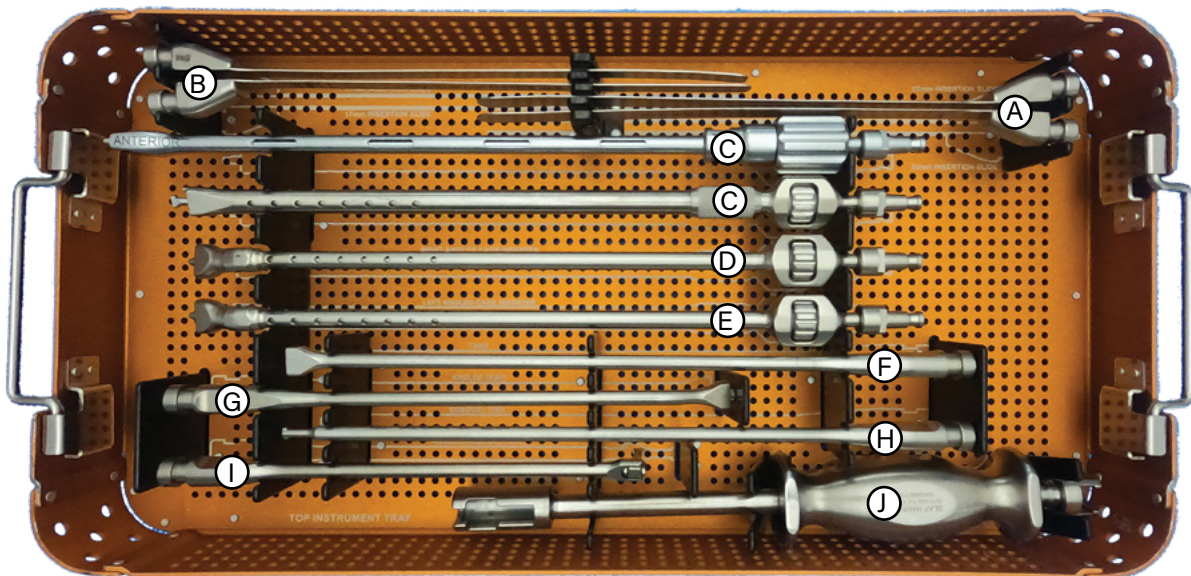
- |                                       |                                       |
|---------------------------------------|---------------------------------------|
| (A) 17mm x 8mm x 6° Trial V070-61708  | (E) 22mm x 8mm x 6° Trial V070-62208  |
| (B) 17mm x 9mm x 6° Trial V070-61709  | (F) 22mm x 9mm x 6° Trial V070-62209  |
| (C) 17mm x 11mm x 6° Trial V070-61711 | (G) 22mm x 11mm x 6° Trial V070-62211 |
| (D) 17mm x 13mm x 6° Trial V070-61713 | (H) 22mm x 13mm x 6° Trial V070-62213 |

## VEO Trial: Bottom Tray



- |   |   |
|---|---|
| Ⓐ 17mm x 7.5mm x 0° Angled Trial V070-A1775 | Ⓔ 22mm x 7.5mm x 0° Angled Trial V070-A2275 |
| Ⓑ 17mm x 9mm x 0° Angled Trial V070-A1709   | Ⓕ 22mm x 9mm x 0° Angled Trial V070-A2209   |
| Ⓒ 17mm x 11mm x 0° Angled Trial V070-A1711  | Ⓖ 22mm x 11mm x 0° Angled Trial V070-A2211  |
| Ⓓ 17mm x 13mm x 0° Angled Trial V070-A1713  | Ⓖ 22mm x 13mm x 0° Angled Trial V070-A2213  |

## VEO Implant: Top Tray



- |                                |                             |                                |
|--------------------------------|-----------------------------|--------------------------------|
| Ⓐ 22mm Insertion Slide 22-0638 | Ⓔ Left Angled Cage Inserter | Ⓛ Angled Removal Tool FA-06518 |
| Ⓑ 17mm Insertion Slide 22-0639 | Ⓕ Tamp 20-3006              | Ⓜ Slap Hammer V070-0004        |
| Ⓒ Cage Inserters               | Ⓖ Angled Tamp CMP-06590     |                                |
| Ⓓ Right Angled Cage Inserter   | Ⓗ Removal Tool 20-3014      |                                |

## VEO Implant: Middle Tray



Ⓐ 17mm x 0° Cages

Ⓑ 17mm x 6° Cages

## VEO Implant: Bottom Tray



Ⓐ 17mm x 0° Cages

Ⓑ 17mm x 6° Cages

**NOTE:** Implants are by request only. Contact Sales Support to order.







# Spine the Right Way.<sup>SM</sup>



VEO<sup>®</sup>

Lateral Access and Interbody Fusion System

  
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