Timberline® Lateral Fusion System

ZimVie

Tips and Tricks Guide

PRE-OP	DETAIL
Extra Disposable Kits	Have a spare Monitoring and Access kit available in the event an item breaks, is dropped, or is otherwise not usable
Contact Neuromonitoring Service	Contact the IOM service group at least a week in advance to ensure the best monitoring system, software, and tech is available. Review the monitoring protocol options with the tech, and makes plans to review with the surgeon. Ensure the tech understands the importance of reaching thresholds, not just whether or not a response is seen.
Review Monitoring Protocol with Surgeon	Ensure the surgeon is aware of the planned monitoring approach. Review the type of system available and discuss the capabilities of that system, and the best approach (It is best if the tech is involved in this discussion). Find out if the surgeon wants to see the monitoring screen.
Set Ordering and Check-in	Confer with the surgeon to ensure you have everything they need. Order in the appropriate trays and disposables. Inspect all trays to ensure they are complete, and that no instruments are broken. Check the sets in with the SPD at least 24 hours prior to the case.
In-service Scrub Tech	For first time users, make sure to walk-through the retractor assembly with scrub tech/operative staff before the case.

SET-UP, POSITIONING and MAYO STAND	DETAIL
OR Layout	Ensure the C-arm monitor is set-up at the foot of the bed, the C-arm is positioned across from the surgeon, and the light source should be up near the anesthesia station. If the surgeon wants a monitoring screen, ensure one is available and position it across from the surgeon. Surgeon should be on posterior side of patient.
Disposables Distribution	Give the EMG/SSEP Kit to the monitoring Technician. Give the Probe and Connector Kit, and the Access Kit contents to the circulating nurse so she can give the sterile items to the scrub tech.
Assist Tech in Mayo Set-up	Before the case begins help the tech pull out the appropriate instruments: dilators, dilator holder, K-wires, monitoring probes, shim impactor and remover, retractor body and handles, arm knob, annulotomy knife, #10 blade, Penfields.
Retractor Assembly	Help the Scrub Tech assemble the retractor properly per the following: • Insert the Posterior Handle into the back of the CC handle. • Insert the handle assembly into the back of the retractor. • Rotate the locking collar to the half-locked position.
Light Source	Ensure the light source receives an ACMI connection. Have the scrub tech put the light clips into the ends of the bifurcated light cable.
Monitoring Set-up	Have the Scrub Tech place a monopolar probe in each of the dilators. Once the patient is draped, have the scrub tech drop the black end of the extension cable off of the sterile field so the monitoring tech can plug it into the patient module.
Bed Rail Clamp	Have the Scrub Tech hand you the bedrail clamp so you can place it on the bedrail prior to draping the patient. Place the clamp opposite the surgeon (anterior side) up near the patient's arms.

Imaging	DETAIL
Review Keys to Good Imaging with C-arm Tech	Find out if the tech has experience with Lateral cases. Review the following: • Importance of centering all images on the screen. • Aligning the C-arm with the angle of the disc space (wig-wag) . (Have the surgeon accentuate the mark line of the disc space to give the tech a reference). • Need to keep the angle of the C-arm at 0° and 90° in swivel and rainbow. • Movements between A/P and lateral shots.
Review Films with Surgeon	Spend some time with the surgeon before the case looking at films and MRI to evaluate the position of the vessels, look for bony abnormalities, discuss which side they plan to approach from, levels to be operated on, position of the lumbar plexus, special instrument needs, etc.
Tech Assist	Assist the tech during the procedure to ensure the C-arm is always aligned with the disc space and the retractor.

PROCEDURE TIPS	DETAIL
Monitoring	Confirm the tech has all 4 twitches. Ensure the surgeon stimulates by quadrant to ensure the position of the dilator is not between nerve roots.
Retractor Blade Depth	As soon as the surgeon has traversed the psoas muscle, ask for a depth marking so the tech can start assembling the correct blades. This will help to ensure the surgeon is not waiting on the tech for the retractor. • We typically add 10 mm to the mark at the level of the skin. • If the retractor will be near the patient's pelvis, you may want to use longer blades to have enough space to keep the retractor level.

Blade Assembly and Retractor Preparation	Help guide the tech through blade assembly. Recommend using the **ball-tipped driver,** it is much easier to use then the posterior handle. Hold the retractor flat. The tech should have the retractor arms open about 1 cm while assembling the blades. Ensure the scrub is holding the blade in place on the little nub while tightening the assembly screw. The blade should be snug, but not overly tight as you risk stripping the screw. **BEFORE HANDING THE RETRACTOR TO THE SURGEON,** have the scrub tech close the retractor properly per the following: 1. Pull the center blade back a few millimeters. 2. Close the CC arms by rotating the CC handle clockwise. 3. **Cinch the CC blades tight.** 4. Then advance the posterior blade forward again until it is snug up against the CC blades. **This helps to keep the blades from splaying while inserting the retractor.** Have the scrub place a monopolar probe into the posterior blade of the retractor.
Retractor Insertion	The surgeon should rotate the retractor back and forth while pushing it down into place. This helps to ensure the psoas muscle tissue and any retroperitoneal fat do not get stuck underneath the retractor blades.
Articulating Arm Attachment	Ensure the PA, resident, or surgical assistant supports the weight of the articulating arm while the surgeon screws it into the retractor. If this is not done properly the thumb screw may feel tight before it is fully secured. Have the surgeon use the arm knob to help tighten the thumb screw and ensure the connection is tight. If the thumb screw threads are not exposed through the arm, turn it clock-wise until it drops to a position where it can be threaded into the retractor.
Retractor Positioning	**The retractor should be positioned parallel to the disc space (previously aligned with the C-arm), and parallel to the floor.** This is critical for ensuring a good trajectory of instrumentation into the disc space. This can be confirmed with lateral fluoroscopy. After the retractor is in place and the arm is attached, have the C-arm tech use live fluoro while the surgeon manipulates the retractor such that they can look directly down the retractor blades to the spine.
Shim Advancement and Adjustment	With this retractor, the surgeon has the option of advancing the intra-discal shim prior to removing dilators. This helps avoid unwanted migration of the retractor. The surgeon needs to confirm the retractor is in a safe position prior to advancing the shim – that there are no nearby nerve roots that could be harmed by the shim. **The shim does not need to be impacted very hard to advance it!** If impacted with too much force the shim could become deformed allowing it to come out of the blade. Light taps with a mallet or by hand is sufficient. • Ensure the surgeon is visualizing the position of the shim using A/P fluoroscopy prior to and while advancing it. • The surgeon should take extra care to avoid advancing the shim into one of the vertebral bodies If the surgeon needs to adjust the shim for any reason, they need to use the shim remover.
Light Clip Attachment	The waveguides are attached to the top of the CC retractor blades. **Ensure the surgeon places the light clips on by dropping them straight down onto the blade.** This helps to ensure proper seating of the clips. If the surgeon does not put them on correctly, it can damage the waveguide.
Scoville Retractor and Anterior Bar	The scoville retractors help in identifying the anterior margin of the vertebral body, and avoid damage to the ALL. The surgeon needs to use care when placing this. It should be placed just anterior to the ALL and no more than about 1/3 across the vertebral body. The scoville retractor blade also acts as a marker to ensure the surgeon keeps instruments in-line with the disc space. It is a good reference point.
Template the Disc Space	It is a good idea to template the disc space prior to incising the annulus. This can be done using one of the box cutters (either 18 or 22 mm). Place the box cutter just above the disc and take a lateral fluoro shot. This does two things: 1. It checks to ensure the exposure is appropriate for the implant the surgeon wants to use. 2. It allows the surgeon to confirm his annulotomy will initiate an appropriate implant entry point that is not too far anterior or posterior. Reference the lateral fluoro shot just taken to confirm this position.
Disc Removal	**Disc Spreaders**: The set has a 3 mm and 6 mm (16 mm wide) disc spreader that are great for distracting collapsed disc spaces. This helps to temporarily loosen up the ligaments and annulus to allow for discectomy, trialing and implantation. **Cobb Elevator:** Caution needs to be used with the cobb elevators. The intent here is to scrape the endplates, separating the disc from the vertebral body. At times an angled cobb is needed to reach the concavity of the vertebral body. USE CAUTION NOT TO DAMAGE THE ENDPLATES. An X-ray should be taken with each tap of the cobb. It should be manipulated to carefully to follow along the endplate, but not penetrate into bone. **Rongeurs:** Rongeurs should be oriented with the grip facing away from the surgeon. This places the flat, blunt portion of the jaw towards the ALL helping to ensure it is not inadvertently damaged. **Box Cutters:** Box cutters are very effective tools to quickly remove large amounts of disc material. However, the surgeon must use a lot of caution in using this instrument to ensure the endplate is not violated. **The trajectory must be perfect!** This is confirmed by ensuring the viewing window is solid and clear. If it is not, then either the instrument is rotated, or the C-arm is out of position. **Paddle Shavers & Rotating Disc Cutters:** These are very aggressive instruments for removing disc material. These are not intended as distraction instruments and therefore the appropriate size should be selected to fit the disc space. Much care should be taken to avoid removing any bone. **Rasp Trials:** The rasp trials are 18 mm wide, and help to distract the disc space, remove the last of the disc material, and give you an initial estimate on implant length and height. *The sales representative should be standing at the base of the bed during this part of the procedure. They should be watching the angle of the disc prep instruments to ensure the shafts are straight up and down.*
Implant Trialing	The trial window represents lengths of 40, 50 & 60 mm. Windows should appear crisp and round. If this is not the case either the A/P wig-way angle is off or the trial is rotated. Take caution not to over distract the disc space.
Implant Insertion	The inserter is a two piece design. Hold the bottom while inserting the draw rod with the flat side facing up. Pull on the draw rod to ensure it is locked. An audible click should be heard. Graft slides are available to prevent graft material from coming out.

Timberline interbody implants are intended to be used with supplemental spinal fixation.

Caution: Federal (USA) law restricts this device to sale by or on the order of a physician. Rx Only. Please see the product Instructions for Use for a complete listing of the indications, contraindications, precautions, warnings and adverse effects.