

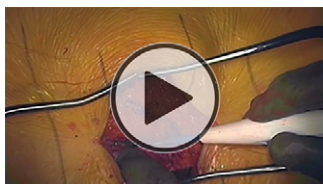
## KEY PROCEDURES

TRANSFORAMINAL LUMBAR INTERBODY  
FUSION (TLIF)

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Published outcomes of this procedure can be found at: *Spine J.* 2015 Oct;15(10):S87, *Spine J.* 2014 Nov 1;14(11):S28-9, *J Neurosurg Spine.* 2011 Aug;15(2):138-43, *J Neurosurg Spine.* 2011 Sep;15(3):295-310.

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## Abstract

**H**istorically, posterior lumbar interbody fusion was performed using a directly posterior procedure (PLIF). Transforaminal lumbar interbody fusion (TLIF) utilizes a more lateral window in order to access the interbody space without excessive dural retraction. Theoretical advantages of TLIF include increased fusion success, more complete foraminal decompression, better correction of deformity, and more effective treatment of discogenic pain. The procedure is done with the following steps:

- 1 and 2. Preoperative planning and patient positioning are important to maximize the efficiency of the procedure. There is a wide variety of instrumentation and technique options; therefore, a systematic approach starting with setup is important.
3. The spine is approached through a standard posterior midline incision. It is not necessary to expose the lateral gutters, but the addition of posterolateral fusion is common.
4. Pedicle screw placement is undertaken via a standard approach.
5. Decompression is initiated with a laminectomy in the midline, exposing the ligamentum.
6. The ligamentum is carefully removed, and hemostasis is obtained. A facetectomy is then performed.
7. Once the posterior bone elements are resected and the decompression is complete, the dura and neural elements are mobilized. The goal is to be able to access the posterior anulus and disc space easily without any dural tension.
8. Distraction through the TLIF level helps facilitate interbody placement. We describe a triple distraction technique that uses the midline elements, and both contralateral and ipsilateral distraction methods.
9. A window is formed on the disc, with care taken to protect the exiting and traversing roots. The window is enlarged using a combination of box osteotomes and Kerrison rongeurs. A window that is a minimum of 10 mm in size facilitates disc space preparation.

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- 10 and 11. Disc space preparation is performed using a combination of curets, pituitary rongeurs, and end-plate preparation tools. Thorough disc-space preparation is critical for both correcting the deformity and obtaining a solid fusion.
12. The disc space is sized for an appropriate interbody cage. The anterior aspect of the disc space and the cage are both packed with bone graft. This may involve the use of iliac crest graft, local bone, or bone substitutes, depending on the specific clinical situation.
13. Cage and screw placement is verified by biplane radiography, and lordosis is restored by compression across the screws bilaterally. Osteotomy of the contralateral facet may be necessary to achieve substantial restoration of lordosis.
14. If the lateral gutters have been exposed, grafting in this region is undertaken as well. Care must be taken with graft placement on the TLIF side as facet and pars resection leaves the exiting route exposed.
15. Closure is undertaken in a standard fashion.

Postoperative recovery does not differ substantially from other standard fusion procedures. Mobilization is undertaken over the first several weeks, and fusion healing is expected in the 6-month to 1-year time frame.

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