X360

Comprehensive lateral system enabling single-position surgery

NuVasive

Building on the legacy of XLIF, X360 combines less invasive procedural solutions—XLIF, XALIF and XFixation—with cutting edge technologies to offer the most comprehensive and customizable lateral system in the market enabling single-position surgery.

Benefits of less invasive anterior surgery

The introduction of XLIF and NVM5 transformed the minimally invasive surgery spine market, demonstrating superior[1–8] and more predictable outcomes than traditional spinal fusion procedures with substantially fewer complications.

Improved clinical outcomes

- 97% fusion/healing rates with XLIF[1]
- 50% reduction in revision rates[2]
- 50% shorter length of stay[2]

Improved restoration of height and alignment

- 97% achievement of indirect decompression[3]
- 75% greater foraminal height restoration than TLIF and PLIF[4]

Reduced morbidity

- 90% reduction in infection rates compared to TLIF and PLIF[2]
- 90% reduction in blood loss[5–8]

Benefits of lateral single-position surgery

The X360 system is designed to enhance surgical workflow, reduce operative time, and improve patient outcomes through modern, less invasive techniques performed with the patient in lateral decubitus

Reduced operative time

X360 can reduce up to 60 minutes[9] of operative time through the removal of supine or lateral to prone repositioning.

Cost savings

X360 can reduce hospital costs by an average of $5,000 per patient.[10,11] Cost estimated at $80 per minute.

Reduced time under anesthesia

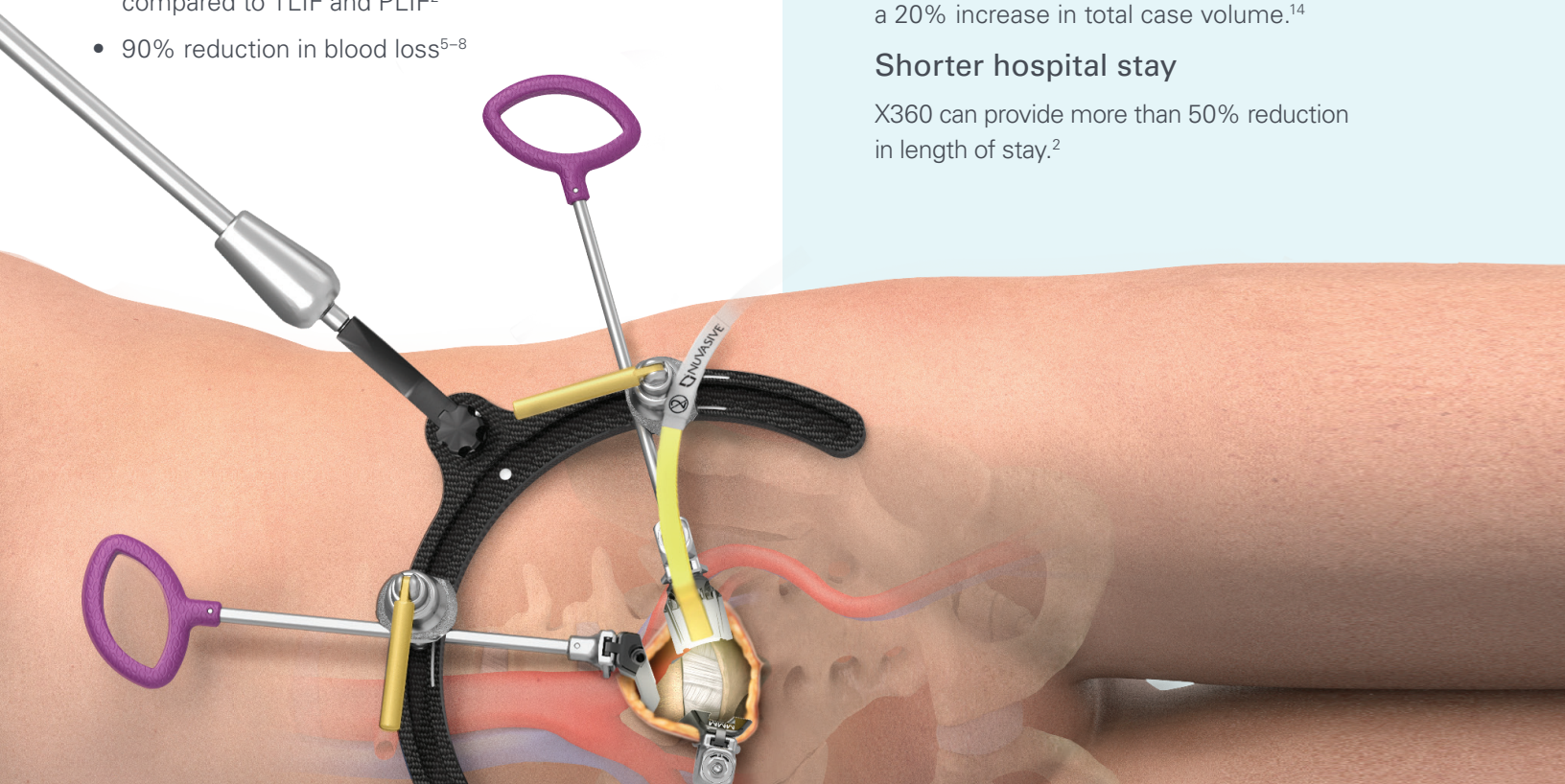
X360 can reduce patient time under anesthesia and lower associated intraoperative risks.[12,13]

Increased case volume

Surgeons adopting the lateral approach have seen a 20% increase in total case volume.[14]

Shorter hospital stay

X360 can provide more than 50% reduction in length of stay.[2]



X360 case study

Leveraging the flexibility and efficiency of the X360 workflow, the surgical team was able to accomplish a L4–S1 fusion (indirect decompression only) in 92 minutes, **reducing operative time** and **patient time under anesthesia.** The estimated blood loss was reported at 50 cc and the patient stayed in the hospital for 23 hours. The team took the patient's alignment measurements via iGA pre and post-op, to confirm the desired correction. The surgical workflow accommodated access surgeon scheduling by allowing the spine surgeon to begin the procedure with right-sided L4–L5 XLIF followed by L4–S1 XFixation, completing the posterior fusion and closing the XLIF incision prior to the access surgeon entering the OR. The surgical team then executed the L5–S1 XALIF and dropped the rods posteriorly, prior to closing the anterior and posterior incisions.

Patient information

- 68-year-old female
- Body mass index of 23.1

History of present illness

- Severe back and bilateral leg pain that became worse with standing/walking
- Subjective leg weakness.

Post-op outcomes*

- Patient has restored sagittal alignment
- Patient is back to walking without a wheelchair
- Immediate resolution of leg pain
- No pain reported at 3 month follow-up

* Patient results and recovery may vary.

Alignment measurements via iGA:

Pre-op confirmation: PI-LL is 14°

Post-op confirmation: PI-LL is 1°

Lateral pre-op fluoro

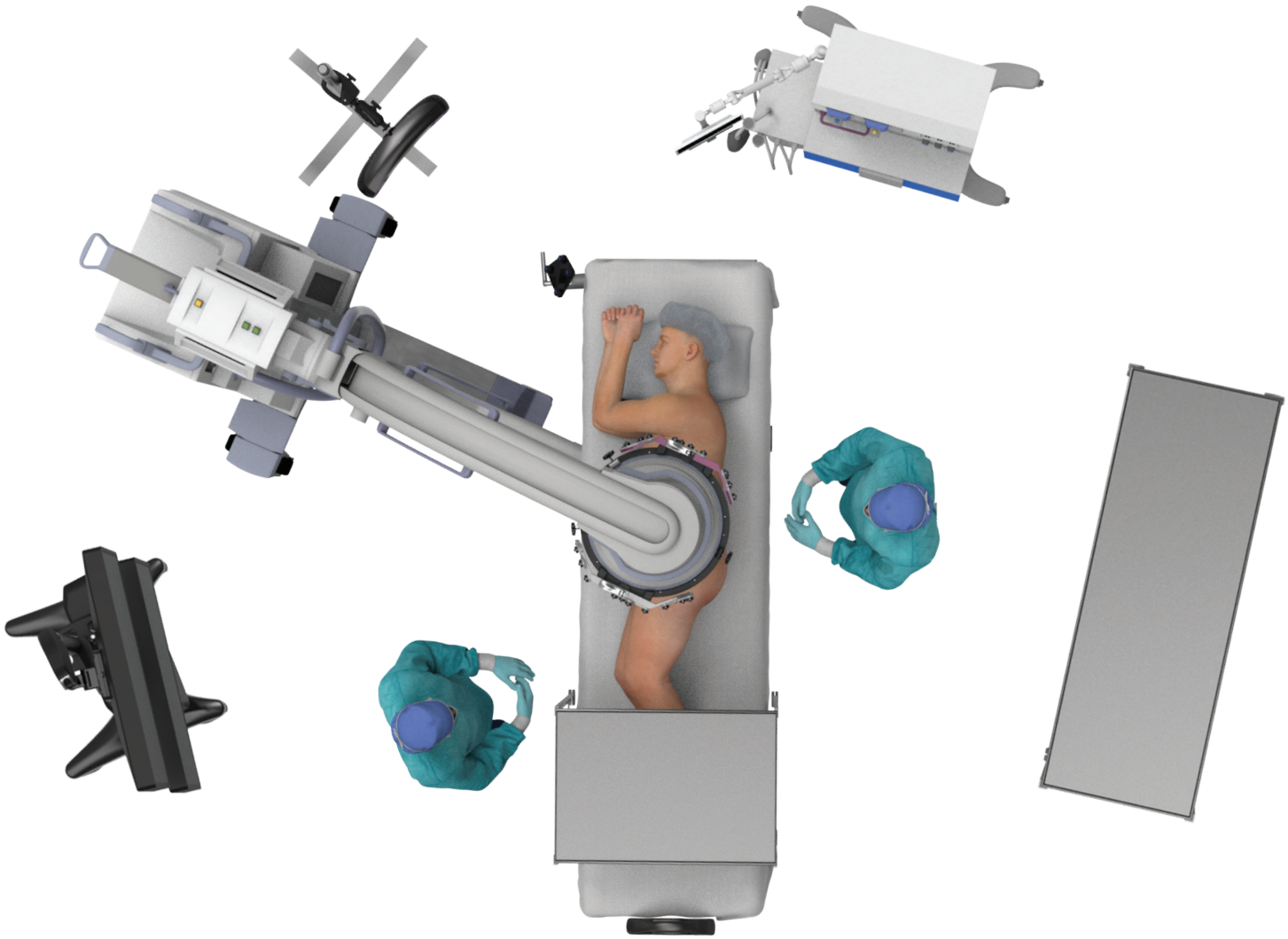
Lateral post-op fluoro

A/P pre-op fluoro

A/P post-op fluoro

X360 OR setup and surgical workflow

To take advantage of the time benefits associated with lateral single-position surgery, it is important to set the OR up for maximum efficiency prior to the case. X360 provides significant OR time savings[9] by keeping the patient in lateral decubitus throughout the entire surgery. By performing multiple procedures in the lateral position, a surgeon is able to customize their workflow allowing for greater OR efficiency.



1 *Pre-op*

Plan

2 *Intra-op*

XALIF XLIF XFixation

3 *Post-op*

Confirm

- Neuromonitoring
- Global alignment
- Rod bending
- Radiation reduction and imaging enhancement
- Navigation

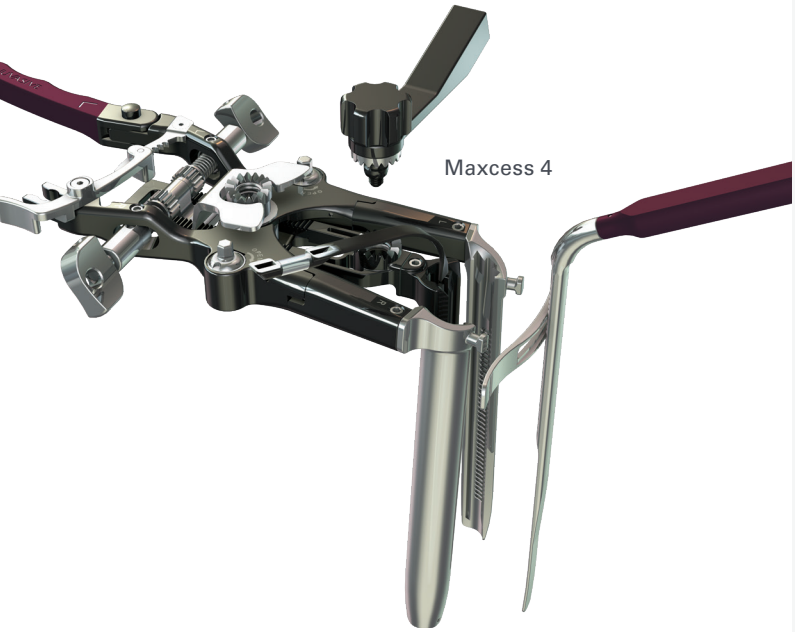
Pulse

One position, one comprehensive solution

Access

Maxcess 4 and XALIF access

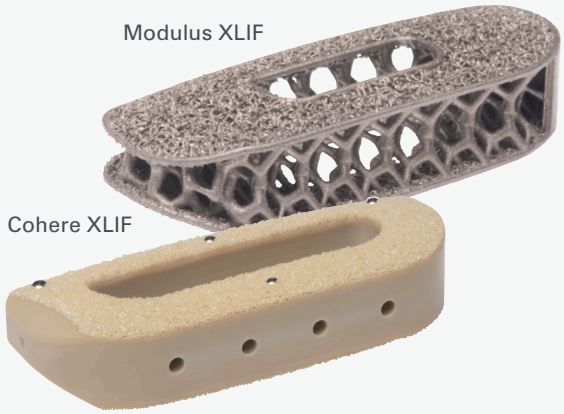
The X360 system has dependable access systems that are designed to deliver reproducible outcomes by combining strength, precision, fluoro-visibility and integrated neuromonitoring.



Interbody

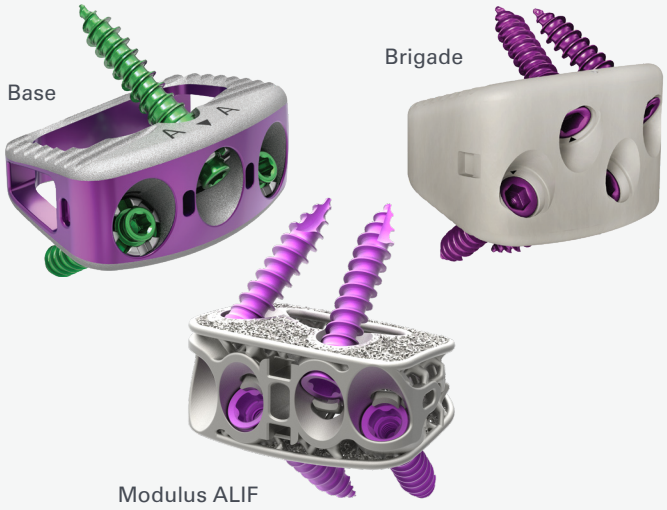
XLIF: Advanced Materials Science and smooth PEEK portfolios

Adhering to the three core principles of Advanced Materials Science, surface, structure and imaging, NuVasive has pioneered design and manufacturing methods that combine the inherent benefits of porosity with the advantageous material properties of PEEK and titanium, allowing surgeons reliable options for their X360 cases.



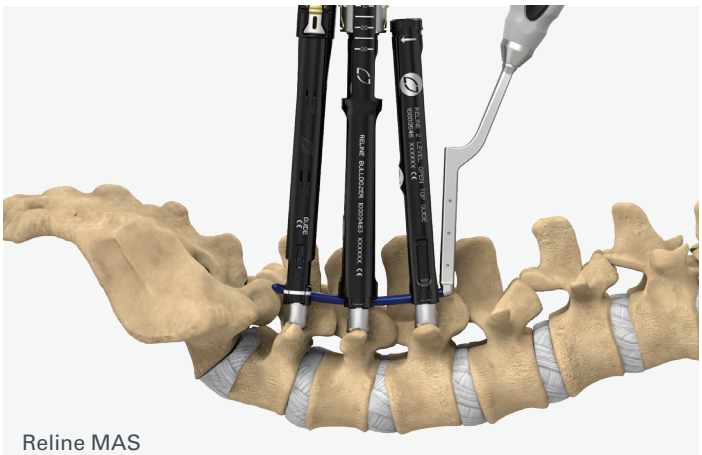
XALIF: Advanced Materials Science, Base and Brigade portfolios

The XALIF interbody product offerings include Modulus ALIF, Base, and Brigade. They are specifically designed to help rebuild spinal foundation at the base of the spine based on the importance of Integrated Global Alignment (iGA).

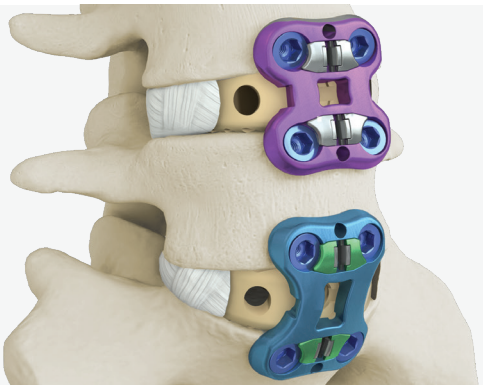


Fixation

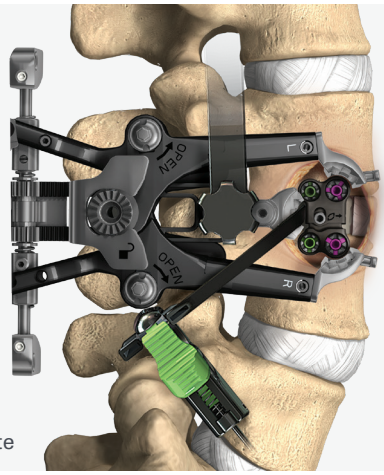
The X360 system offers a multitude of fixation options for any patient specific need.



Reline MAS



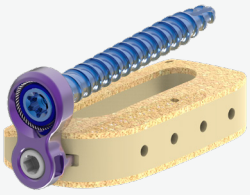
Brigade
ALIF plate



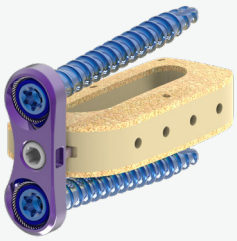
XLIF Decade plate

Modulus XLIF
single sided plate

Modulus XLIF
dual sided plate



AMS single
sided plate



AMS dual
sided plate

Biologics

Osteocel Pro and Osteocel Plus

Osteocel Pro and Osteocel Plus provide all three essential mechanisms for bone formation—osteoconduction, osteoinduction and osteogenesis.[15] Osteocel, the most studied cellular allograft, is backed by more than 16 years of research and 300,000 patients treated. Its cohesive and moldable handling characteristics make it a preferred biologic.

Osteocel Plus

Osteocel Pro

Surgical Intelligence

NVM5: one device, multiple enabling technologies

NVM5 combines intraoperative neuromonitoring and other surgical technologies into a single platform, specifically designed to support the unique requirements of spine surgery. These enabling technologies include **neuromonitoring, global alignment and rod bending.**

Pulse: an integrated technology platform to enable better spine surgery

Pulse integrates multiple enabling technologies to improve workflow, reduce variability and increase the reproducibility of surgical outcomes. These technologies include **neuromonitoring, global alignment, rod bending, radiation reduction[16] and imaging enhancement, and navigation.**

- Neuromonitoring
- Global alignment
- Rod bending
- Radiation reduction[16] and imaging enhancement
- Navigation

References

1. Rodgers WB, Gerber EJ, Patterson JR. Fusion after minimally disruptive anterior lumbar interbody fusion: analysis of extreme lateral interbody fusion by computed tomography. *SAS Journal* 2010;4:63-6.
2. Lucio JC, VanConia RB, DeLuzio KJ, et al. Economics of less invasive spinal surgery: an analysis of hospital cost differences between open and minimally invasive instrumented spinal fusion procedures during the perioperative period. *Risk Manag Healthc Policy* 2012;5:65-74.
3. Gabel BC, Hoshide R, Taylor W. An algorithm to predict success of indirect decompression using the extreme lateral lumbar interbody fusion procedure. *Cureus* 2015;7(9):e317.
4. Oliveira L, Marchi L, Coutinho E, et al. A radiographic assessment of the ability of the extreme lateral interbody fusion procedure to indirectly decompress the neural elements. *Spine* 2010;35(26 Suppl):S331-7.
5. Dakwar E, Cardona RF, Smith DA, et al. Early outcomes and safety of the minimally invasive, lateral retroperitoneal transpsoas approach for adult degenerative scoliosis. *Neurosurg Focus* 2010;28(3):E8.
6. Lehmen JA, Gerber EJ. MIS lateral spine surgery: a systematic literature review of complications, outcomes, and economics. *Eur Spine J* 2015;24(Suppl 3):S287-313.
7. Dhall SS, Wang MY, Mummaneni PV. Clinical and radiographic comparison of mini-open transforaminal lumbar interbody fusion with open transforaminal lumbar interbody fusion in 42 patients with long-term follow-up. *J Neurosurg Spine* 2008;9(6):560-5.
8. Whitecloud TS, Roesch WW, Ricciardi JE. Transforaminal interbody fusion versus anterior-posterior interbody fusion of the lumbar spine: a financial analysis. *J Spinal Disord* 2001;14(2):100-3.
9. Drazin D, Kim TT, Johnson JP. Simultaneous lateral interbody fusion and posterior percutaneous instrumentation: early experience and technical considerations. *Biomed Res Int* 2015:Article ID 458284.
10. Macario A. What does one minute of operating room time cost? *J Clin Anesth* 2010;22(4):233-6.
11. Shippert RD. A study of time-dependent operating room fees and how to save $100,000 by using time-saving products. *Am J Cosmet Surg* 2005;22(1):25-34.
12. Olsen MA, Mayfield J, Lauryssen C, et al. Risk factors for surgical site infection in spinal surgery. *J Neurosurg* 2003;98(2):149-55
13. Olsen MA, Nepple JJ, Riew KD, et al. Risk factors for surgical site infection following orthopaedic spinal operations. *J Bone Joint Surg Am* 2008;90(1):62-9.
14. Rodgers WB, Gerber EJ, Rodgers JAK. MIS v open spine surgery: the impact on a surgeon's efficiency. Society of Lateral Access Surgery (SOLAS®) 2010 annual meeting. San Diego, CA
15. Neman J, Duenas V, Kowolik C, et al. Lineage mapping and characterization of the native progenitor population in cellular bone allograft. *The Spine Journal* E-Pub 2013.
16. Wang TY, Farber SH, Perkins SS, et. al. Internally randomized control trial of radiation exposure using ultra-low radiation imaging versus traditional C-arm fluoroscopy for patients undergoing single-level minimally invasive transforaminal lumbar interbody fusion. *Spine* 2017;42(4);217-23.

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Pulse navigation is not presently indicated for use in cervical procedures in the EU.
For important product safety information please visit **nuvasive.com/eIFU**

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