

Evidence Insight Spotlight

Neuromonitoring in Spinal Procedures

Rationale for use

Intraoperative neuromonitoring (IONM) tracks a patient's neural pathways during spinal surgery, alerting physicians to adverse neurological changes. The aim is to prevent postoperative neurological deficits by allowing physicians to perform corrective interventions intraoperatively. IONM is also used to prevent pedicle breach during pedicle screw placement.

Do guidelines and clinical evidence support IONM?

Guidelines recommend IONM in complex spinal procedures including spinal deformities, spinal tumors and extensive decompression, but they discourage use for pedicle screw placement and degenerative spinal disease. Additionally, Lumere's clinical evidence analysis found IONM use beneficial in reducing neurological deficits compared to non-use only in specific spinal procedures.

The following table highlights current guideline recommendations along with Lumere's analysis. In procedures not listed, IONM efficacy is currently inconclusive.

Procedure	Guidelines	Neurological Deficits	IONM Use Supported?
IONM Rationale: Preventing neurological injuries			
Adult deformity	Recommend	Similar	Yes
Lateral lumbar interbody fusion	-	Reduced	Yes
Pediatric deformity	Recommend	Reduced overall complications	Yes
Posterior instrumented: 7 – 12 segments	Deformity only	Reduced	Yes
Tumor resection	Recommend	Similar/better	Yes
Lumbar discectomy: single level	Recommend against	Similar	No
Lumbar fusion: single level	-	Similar	No
Posterior instrumented: 3 – 6 segments	Deformity only	Similar	No
Anterior cervical discectomy and fusion	Complex spinal procedures only	Similar	No
IONM Rationale: Preventing screw breach			
Fenestrated screws – thoracolumbar burst fracture	-	Reduced screw breaches	Yes
Open lumbar pedicle screw	Recommend against	Reduced reoperation but similar overall	No
Minimally invasive pedicle screw	Recommend against	Similar reoperation rates	No
Cervical pedicle/lateral mass screw	Recommend against	Similar screw breaches	No
Minimally invasive pedicle screw	Recommend against	Similar reoperation rates	No

Conclusion

While IONM use is not justified in all spinal procedures, it can prevent neurological deficits or screw breach in limited procedures. Hospitals should establish practice guidelines to prevent overuse.

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