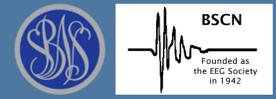


Impact upon hospital resources: A national study of the utilisation of IONM during the resection of intramedullary spinal lesions

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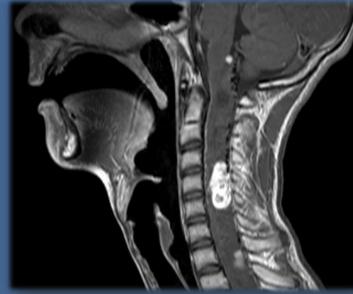
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1. Introduction

Intraoperative neurophysiological monitoring (IONM) requires specialist staff, an investment in equipment in addition to different surgical and anesthetic technical considerations.¹



There is increasing evidence to suggest that neurological deficits are prevented by IONM as the technique warns surgeons of impending damage before permanent injury with adequate time to take evasive action.^{2,3}

Currently there is little evidence that the reduction in harm to patients from IONM translates into a decrease in hospital resources and long term care. Currently only mathematical models exist for spinal IONM for a wide range of cases.⁴

2. Aims & Methods

- To determine national practise for IONM for IM resections.
- To establish the nationwide opinion of IONM during the resection of IM lesions.
- To determine the utilisation of IONM & its impact on hospital resources.

Electronic National Questionnaire

All members of the BSCN and SBNS were contacted via email to complete a questionnaire which determined: The local utilization of IONM and the modalities available. Nationwide opinion of IONM for the resection of IM lesions.

The National Albatross Database

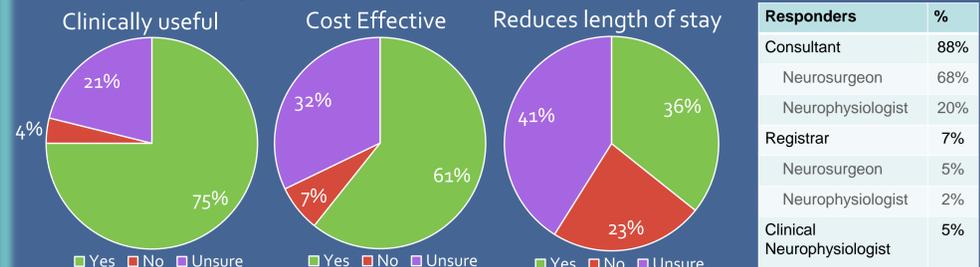
The Database was interrogated for Hospital Episode Statistics (HES) for all intradural, intramedullary spinal lesion resections (HC07Z) at each neurosurgical unit across the UK since 2012.

3. Response from across the UK

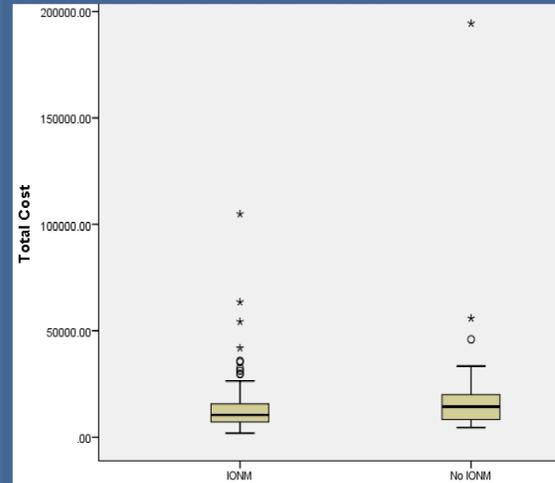
	Response to the questionnaire	No response to the questionnaire	Total
Neurosurgical NHS Trusts/Health Boards across Great Britain	30 (86%)	5 (14%)	35 (100%)
Neurosurgical NHS Trusts/ Health Boards that contribute to the Albatross Database	22 (63%)	1 (3%)	23 (66%)

	No IONM	MEP/EMG	SSEP	Multimodal IONM
NHS Trusts/ Health Boards whom responded	6 (21%)	2 (7%)	1 (3%)	20 (69%)
NHS Trusts/ Health Boards Contributing to the Albatross Database	6 (27%)	1 (5%)	0 (0%)	15 (68%)

4. National Opinion



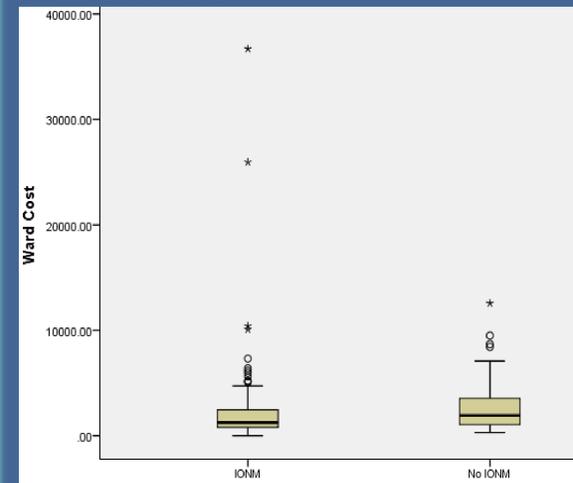
5. Total admission cost



Total admission cost	IONM	No IONM	p Value*
Mean	£13,249	£20,902	0.055
Median	£10,606	£14,306	

Although the IONM group demonstrates lower admission costs, the difference observed was not quite statistically significant.

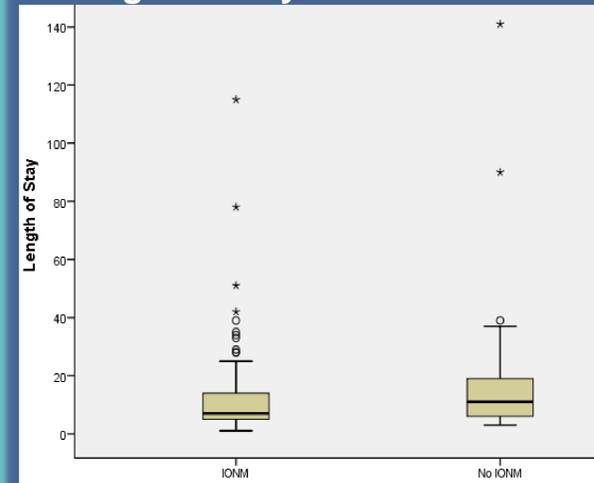
6. Ward cost



Ward cost	IONM	No IONM	p Value*
Mean	£2,233	£3,062	0.017
Median	£1,257	£1,919	

Patients exhibited lower ward costs across all statistical parameters where IONM was utilised. The difference in medians were statistically significant.

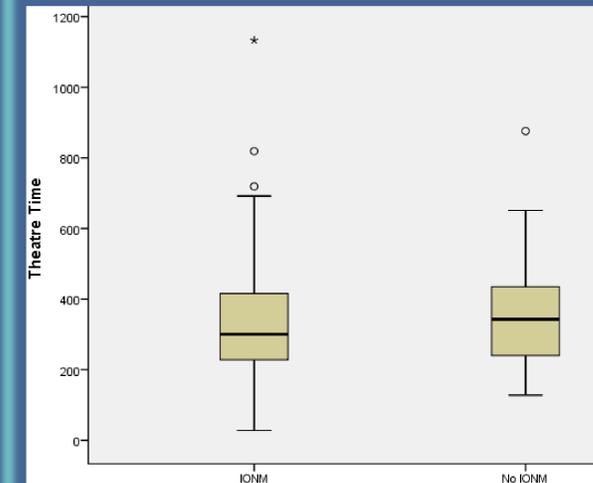
7. Length of stay



Length of stay	IONM	No IONM	p Value*
Mean	11.1	19.3	0.025
Median	7	11	

IONM patients had shorter lengths of stay across all statistical parameters. The difference between the two medians were statistically significant.

8. Time in theatre



Theatre Time	IONM	No IONM	p Value*
Mean	326.4	371.0	0.223
Median	296	342.5	

The IONM group had shorter operations considering both the mean and median but the difference observed was not statistically significant.

9. Limitations

The data collected was retrospective, non-randomized and suffered from selection bias of trusts who uploaded data to the albatross database. In addition, we rely upon the accuracy of the coded data and note that the statistics are only surrogate markers of patient outcome. Furthermore, there will be heterogeneity as to the efficient transfers of patients to a rehabilitation centre and some centres will appear more efficient and have better outcomes.

10. Conclusion

The majority of trusts in Great Britain use IONM where intramedullary resections are performed. The majority of clinicians involved in IONM or IM surgery across the UK, thought IONM was clinically useful and can improve outcome, although less were convinced this meant it was cost effective and they were unsure if this translates into influencing 'length of stay'. This national study demonstrates where IONM is utilised for intramedullary resections the length of stay and ward cost are reduced and these observations are statistically significant.

References: 1. Sala et al. Surgery for intramedullary spinal cord tumors: the role of intraoperative (neurophysiological) monitoring. *Eur Spine* 2007;16 Suppl 2, S130-139. 2. Sala et al. Motor evoked potential monitoring improves outcome after surgery for intramedullary spinal cord tumors: a historical control study. *Neurosurgery*. 2006 Jun;58(6):1129-43. 3. Chamberlain, M. & Tredway, T. Adult Primary Intradural Spinal Cord Tumors: A Review. *Curr Neurol Neurosci Rep*. 2011; 11, 320-328. 4. Ney et al. Cost-Benefit Analysis: Intraoperative Neurophysiological Monitoring in Spinal Surgeries. *J Clin Neurophysiol*. 2013;30(3):280-6.