Compliance with the Best Practice Guidelines (BPGs) for Wrong Level Surgery (WLS) Prevention in high-risk Pediatric Spine Surgery

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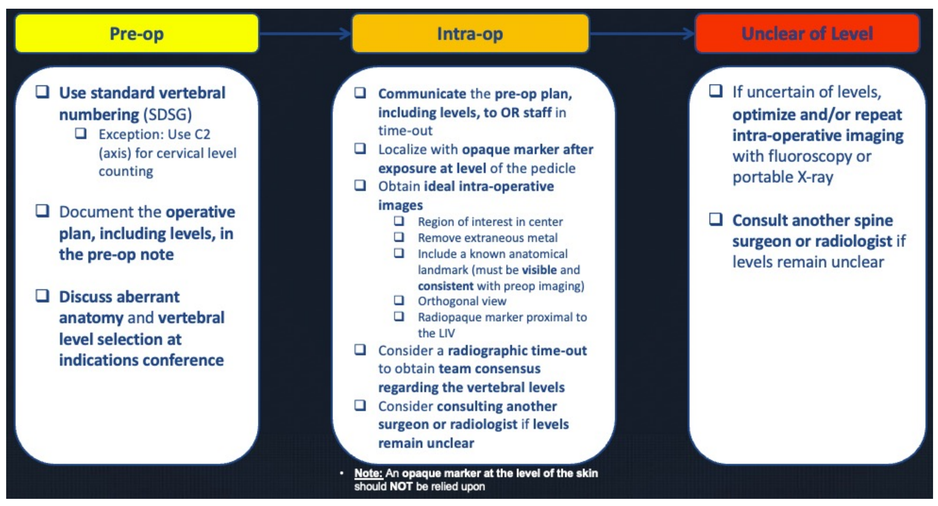
1 Background and Research Gap

- WLS should be a never-event; but it continues to occur despite significant effort
- 50% (200/415) spine surgeons reported having ≥1 WLS during their careers [1]
  - Likely under-reported
- 14% of the population have transitional anatomy of the thoracolumbar and lumbosacral regions [2]
  - Makes identifying the correct surgical levels difficult

Best Practice Guidelines to Avoid WLS were developed using multiple survey rounds to derive consensus



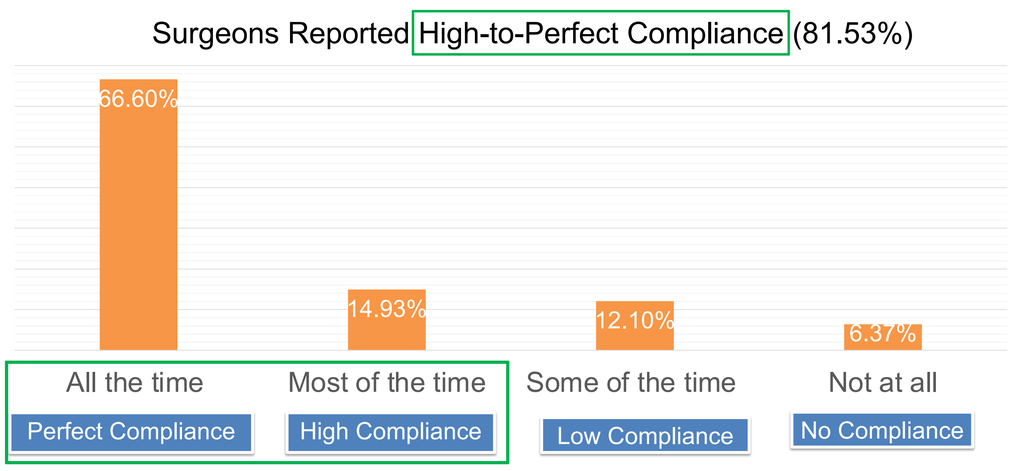
2 Study Purpose

- **Aim 1**: Quantify compliance with the BPGs to prevent WLS among a broad group of pediatric spine surgeons (members of PSSG, HARMS, and EPOS).
- **Aim 2**: Compare any differences in compliance between surgeons from North America and Europe.

3 Study Design

Adapted BPG items into questions with Likert scale responses → Anonymous survey sent to surgeons → Created a Mean Compliance Score (MCS)
-Each Likert response was given a numerical value from 0 to 3, and MCS for each guideline was tabulated by averaging all responses

4 Results



Average MCS for the entirety of the BPGs was 2.4, correlating with a high to perfect compliance

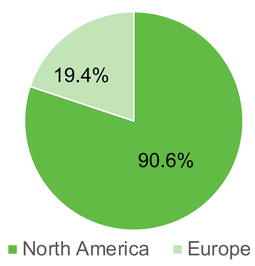
- Moderate positive correlation between awareness of the BPGs and MCS (r=0.48, p<0.01)
- MCS was higher among those aware (2.5) than those that were not aware (2.2) (p<0.05)
- Non-significant association between years in practice and MCS (r=0.41, p=0.64) and between yearly case volume and MCS (r=0.02, p=0.87)

BPGs with less than average "all the time" compliance

Survey Questions	%
Do you document the operative plan, including levels, in the pre op note?	54.2*
Do you discuss aberrant and vertebral level selection and any potential aberrant vertebrae at a preoperative conference with the clinical or surgical team?	51.4*
Do you remove extraneous metal and other radiopaque markers such as sponges or retractors before obtaining intra-operative images?	58.5*
When obtaining intra-operative images, do you: • Obtain an additional orthogonal/lateral view? • Consult another surgeon or radiologist if levels remain unclear?	 14.8* 42.3*

No difference in compliance between North American and European surgeons

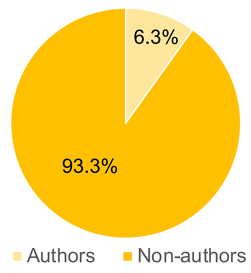
Stratified by Continent



Compliance Between North American and European Surgeons				
Country	**Sample Size (*N*)**	**Mean Compliance Score**	**P-Value:**	**Conclusion**
North America	104	2.4	=0.68	Not Significantly Different
Europe	25	2.3		

Authors were more compliant with the BPGs when compared to non-authors

Stratified Stratified by Authorship



Compliance Between Authors and Non-Authors				
Status	**Sample Size (*N*)**	**Mean Compliance Score**	**P-Value:**	**Conclusion**
Authors	9	2.8	<0.001	Significantly Different
Non-Author	125	2.4		

5 Conclusion

- BPG authors and surgeons aware of the BPGs showed higher compliance
- Continent, study group, years in practice, and yearly case volume did not affect compliance
- BPGs with low levels of compliance represent a possibility to change surgeon behavior:
  - Holding a pre-operative indications conference, standardizing the pre-op note, removing extraneous hardware when obtaining intraoperative images, and using an opaque marker proximal to the LIV

6 References

[1] M. G. Mody, A. Nourbakhsh, D. L. Stahl, M. Gibbs, M. Alfawareh, and K. J. Garges, "The Prevalence of Wrong Level Surgery Among Spine Surgeons," 2008.

[2] S. S. Hashmi, K. D. Seifert, and T. F. Massoud, "Thoracic and Lumbosacral Spine Anatomy," Neuroimaging Clinics of North America, vol. 32, no. 4. W.B. Saunders, pp. 889–902, Nov. 01, 2022. doi: 10.1016/j.nic.2022.07.024.

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