Exploring Patient Safety Challenges and Opportunities in the Block Room: Wrong Sided Blocks
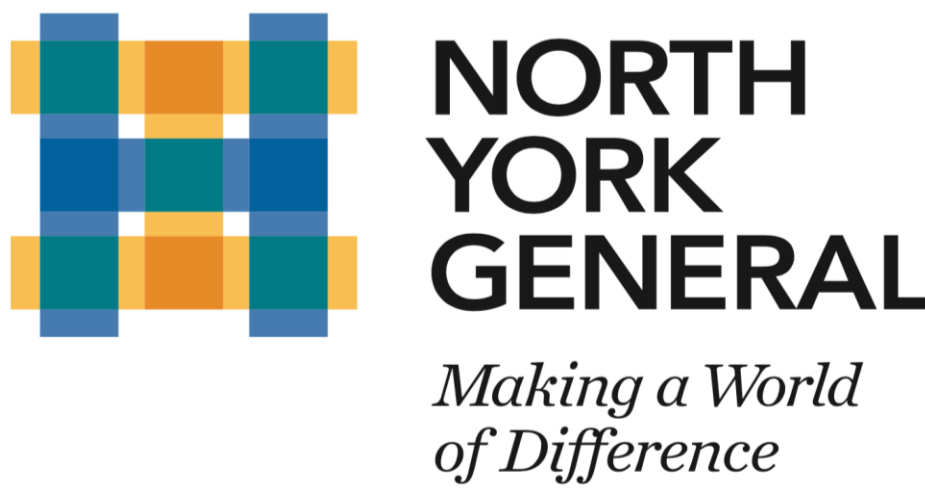
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Background

- The nerve block room is a dedicated space for anesthesiologists to perform pre-operative regional and spinal anesthesia (i.e., nerve blocks).
- Time pressure and complex teamwork processes can lead to variable workflows that risk missing safety steps and compromise patient safety. This can increase the risk of a wrong sided block.
- Research literature shows that despite well-known recommendations, such as marking the site and side to be blocked, wrong sided blocks persist.[1] Inadequate site marking and preoperative site verification are known risk factors contributing to wrong sided blocks.[1]
- There is an incomplete understanding of how or why these interventions are not being consistently performed.

Methods

- An exploratory observational study was completed by two observers in the block room for a total of 20 days from 7am-11am/12pm.
- Observers followed patient care and safety procedures within the block room from start to finish, tracking timestamps of key steps in procedures, case order (e.g., first case of the day, second case of the day), and qualitative observations.
- A total of 200 patients were observed with an average of 9 patients per day.

Result Themes

1) Inconsistent Site Marking Practices

13% (19 of 147) of unilateral regional anesthetic blocks had no site marking prior to the block.

- There is high variability in how and when the site is marked.
- 31.7% of anesthesiologists marked before or after the timeout.
- Verification of the side of procedure is currently difficult during timeouts. Pre-block timeouts are performed by an anesthesiologist and another healthcare provider. While both providers have a source of information to review for the patient's identity (consent form and armband), the second healthcare practitioner has no document in hand to verify the procedure and side. This causes attentional lapses.

**Recommendation: Establish block specific policy to standardize when/how site marking is done**

- Standardize the timing of site marking to coincide with the timeout (to ensure a second person verifies the location).
- The second healthcare practitioner should retain the consent form during the timeout; this supports verification of the patient identity, procedure and side while the anesthesiologist verifies arm band and performs site mark.

2) Time Pressure Reduces Site Marking

The first cases of the day had 16% of cases unmarked, compared to the 11% for second cases and 11% (3 of 27) for 3rd or higher cases.

- During the first case of the day, up to 7 patients require a block, this creates time pressure for staff working to get patients into the operating room on time, which may increase the risk of skipping safety steps.
- Only 3 ultrasounds are available for the 4 patient bays, limiting the number of regional blocks done simultaneously, and increasing the complexity of team coordination.
- Cases without a site marking left the block room more quickly – this suggests the team was pressured to get the patient to the operating room.
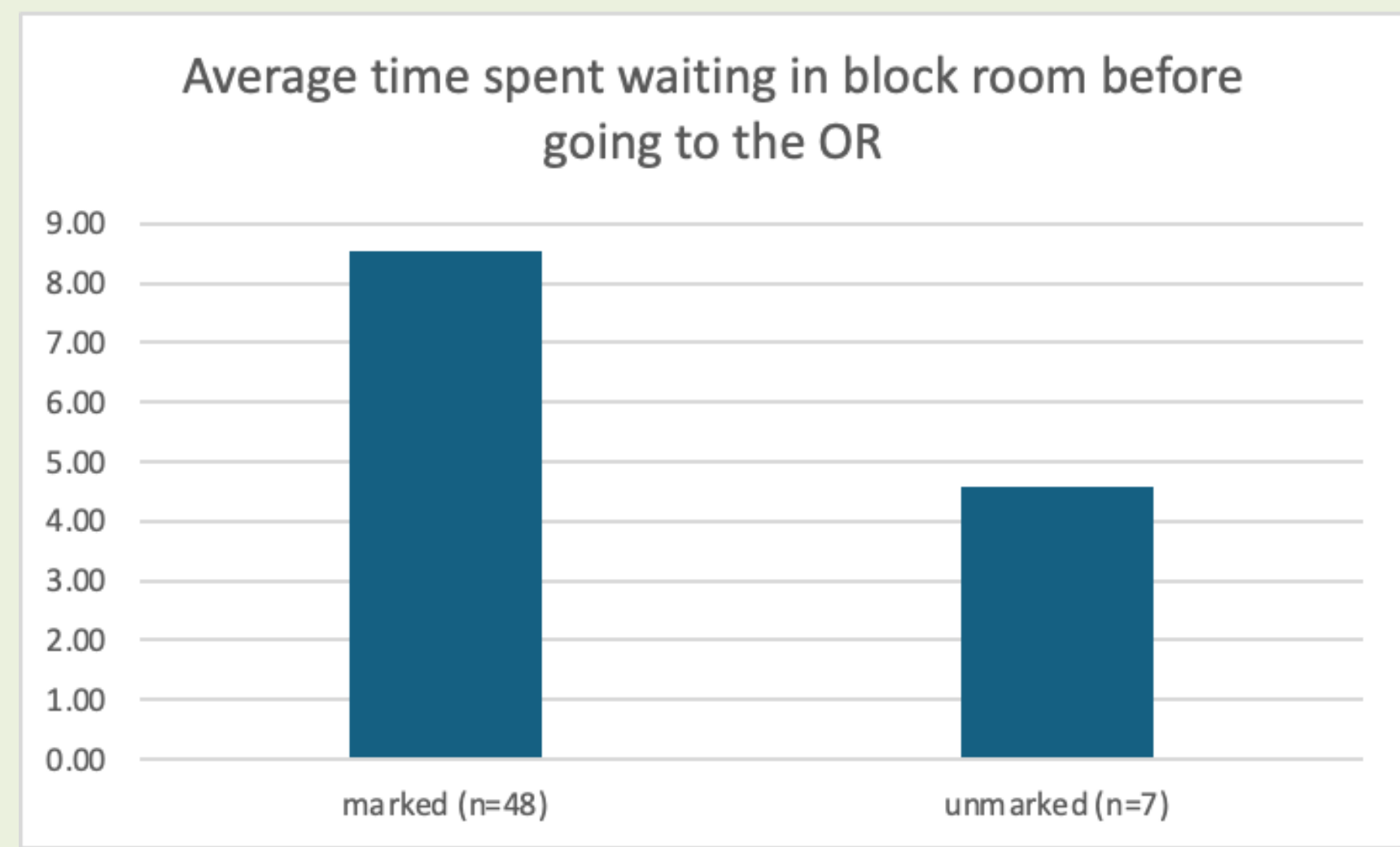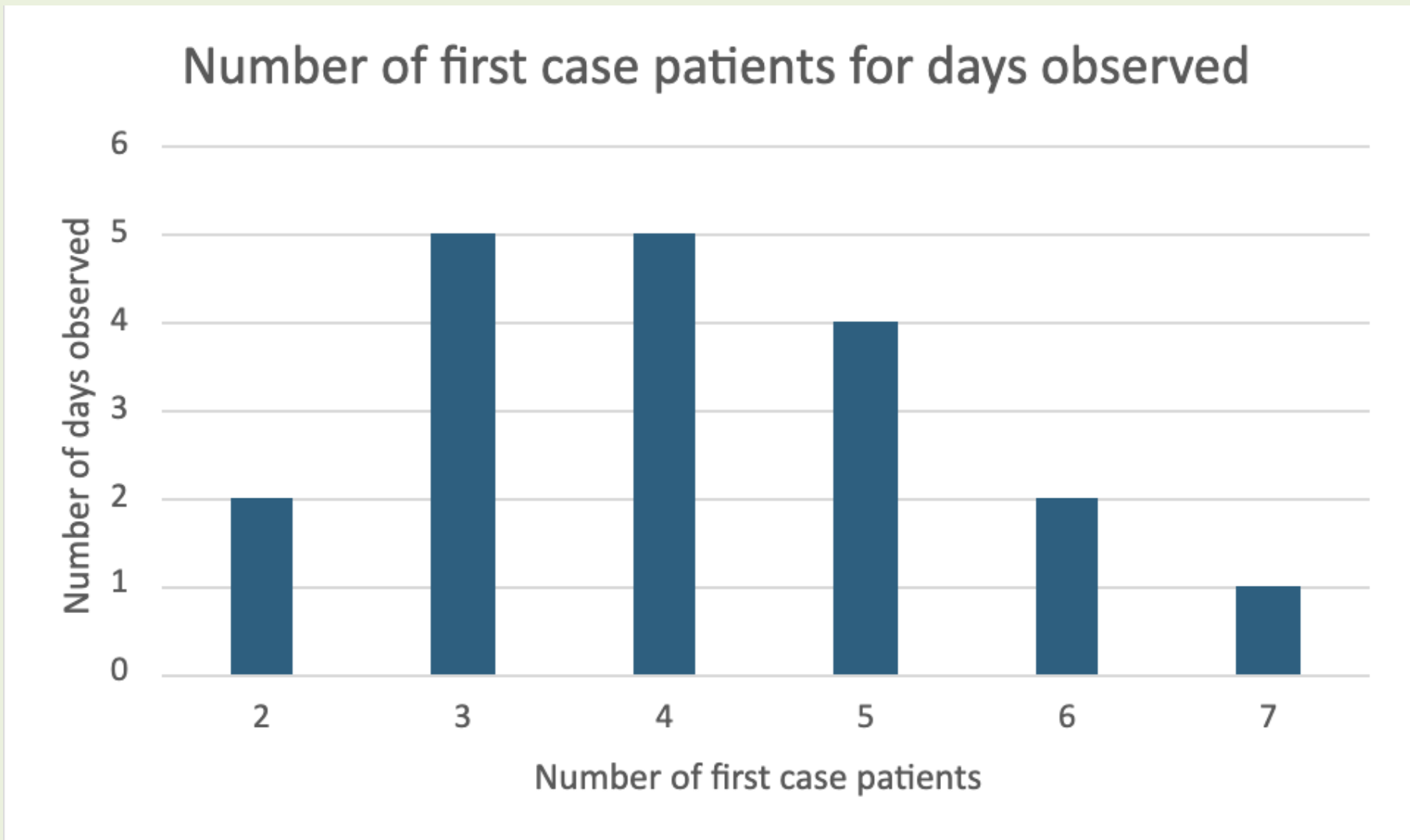
Recommendation: Distribute cases throughout the day and invest in a 4th ultrasound

- Procuring a 4th ultrasound would allow for 4 regional nerve blocks to occur simultaneously, reducing time pressure on staff and reducing the equipment coordination workload.
- Software solutions could be explored that automatically organize the order of cases cases to minimize surges of patients for the block room.

3) Blocking without visualizing the site marking

At least, 13% of cases were blocked without visualizing the site marking

- Given that 13% of blocks proceeded without a site marking, this suggests that even if site marking is being done, anesthesiologists are not referencing the site marking when performing blocks.
- Anesthesiologists may be influenced by other environmental cues such as ultrasound placement relative to the patient. These risk factors become prominent when site marking is not visualized.

Recommendation: Support "No Mark, No Block" practices that require visualization of site marking by block assistant as part of site
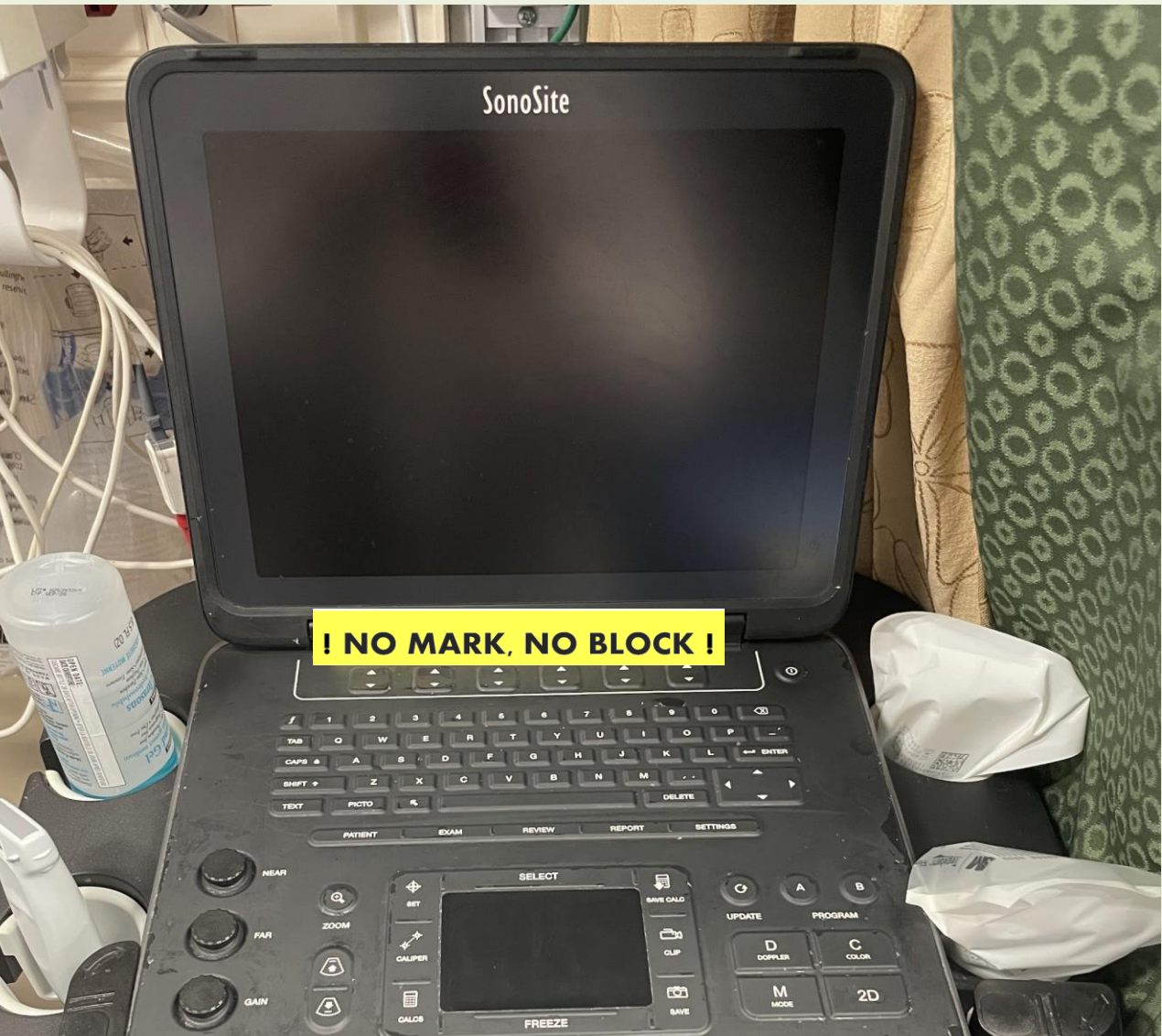
Example of an environmental cue to trigger site verification prior to block on the ultrasound machine.

Conclusion

- Our observations reveal that 13% of the 147 regional nerve blocks did not have a site marking, and that site marking is not consistently used as a mandatory visual safeguard to verify prior to injecting the nerve block.
- Direct observations provide insights into the risk factors behind absent site marking, including: 1) variability in how and when site marking is conducted, 2) scheduling and resource constraints that produce time pressure, and 3) a lack of tools/processes to ensure teams verify the site marking before proceeding with the block.
- Three recommendations to address these different factors are put forward: 1) standardizing site marking policy by specifying when and how site marking is done, 2) investing in a 4th ultrasound, and distributing cases throughout the day to reduce time pressure, and 3) including the visualization of the site marking by the block assistant as part of the block room's site marking policy.

References:

1. Deutsch, E. S., Yonash, R. A., Martin, D. E., Atkins, J. H., Arnold, T. V., & Hunt, C. M. (2018). Wrong-site nerve blocks: A systematic literature review to guide principles for prevention. Journal of clinical anesthesia, 46, 101–111. https://doi.org/10.1016/j.jclinane.2017.12.008