

Improving Regional Nerve Block Safety: A QI Study Using A New Safety Pause Tool

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Background

- Regional nerve blocks (RNB) are effective and widely used, but as invasive procedures, they pose preventable risks such as wrong-sided block (WSB) and anesthetic toxicity.
- The Joint Commission and ASRA recommend the universal protocol, which includes pre-procedural verification, site marking, and time-outs [2-3].
- Such safety protocols are increasingly adopted in regional anesthesia to minimize errors and improve patient safety.

Aims

- Primary: Mitigate risks associated with RNBs & enhance patient safety by developing a safety tool.
- Secondary: Evaluate changes in provider attitudes and perceptions of patient safety following implementation.

Methods

- Single-center pre-post quality improvement study using survey data involving the department of anesthesiology and perioperative medicine.
- Applied Plan-Do-Study-Act methodology to enhance patient safety (figure 1).
- Anesthesia staff received video-based training on anesthetic toxicity and Safety Pause implementation (figure 2).
- Pre- and post-implementation surveys evaluated changes in safety perception.

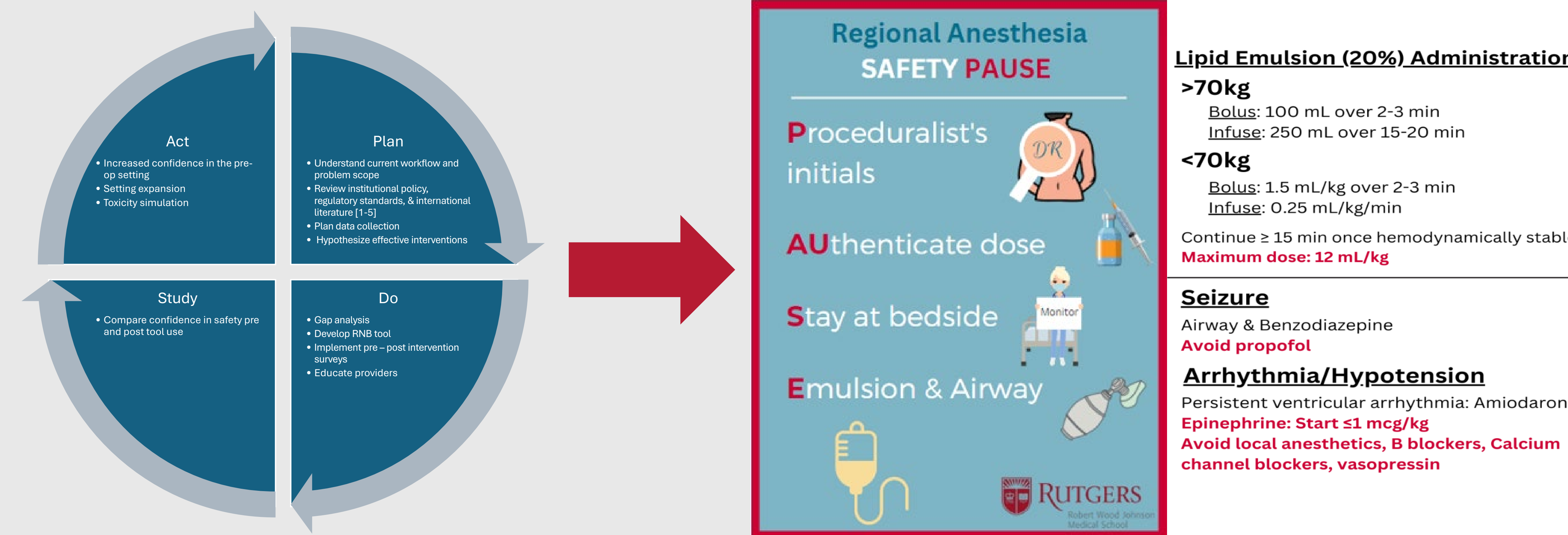


Figure 1. The Plan-Do-Study-Act methodology in quality improvement was used to develop the Safety Pause tool, tailored to the needs of our institution. The Safety Pause tool consisted of 4 steps: placing the anesthesiologist's initials on the block site, verifying the dose of anesthetic, ensuring emergency equipment is in the bay/room, and that there is adequate monitoring until patient departure. The tool also provided dosing information/protocols for local anesthetic toxicity management.

Results

Respondent Demographics		
	Pre-Implementation	Post-Implementation
Total Responses	42	33
Attendings (%)	18 (42.9)	14 (42.4)
Nurses (%)	5 (11.9)	2 (6.1)
Residents (%)	17 (40.5)	15 (45.5)
Other (%)	2 (4.8)	2 (6.1)

Table 1. Breakdown of professional roles of survey respondents. No significant difference was observed in the composition of pre- and post-implementation cohorts ($p = 0.839$).

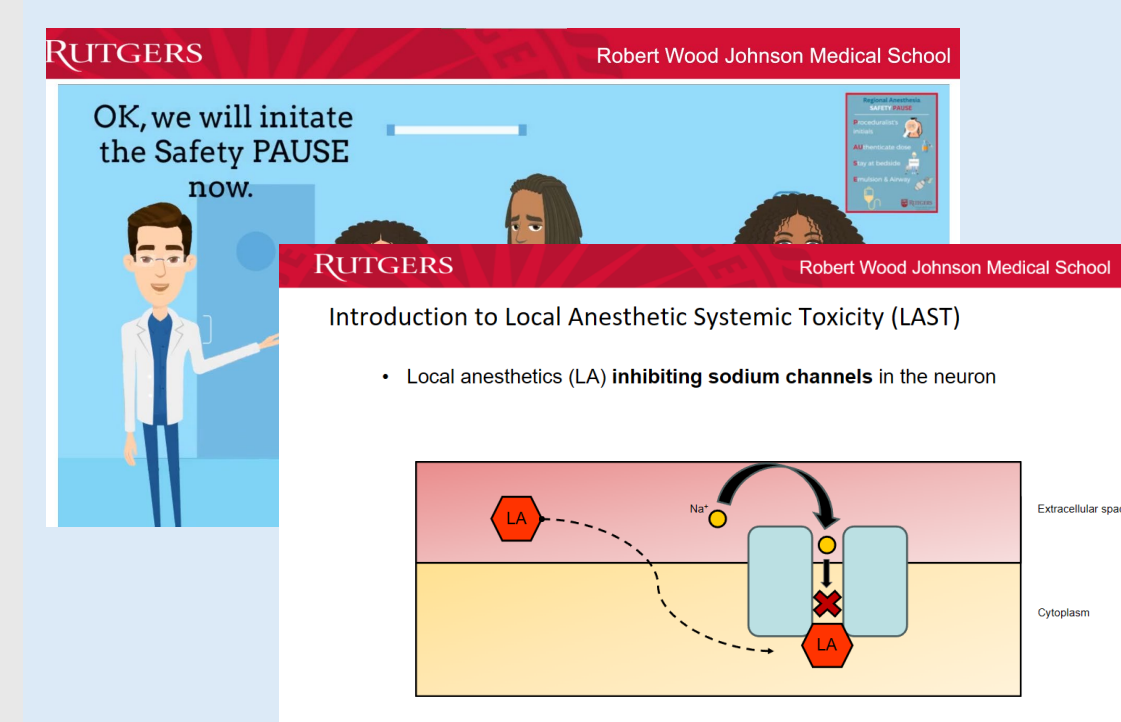


Figure 2. Two educational videos were distributed to the department, one educating staff on local anesthetic toxicity and its management, and the other demonstrating how to integrate the Safety Pause tool into the current workflow.

78.8% of respondents viewed the educational implementation videos

Item	MWU statistic
1. How confident are you in the overall safety of the pre op holding area's current workflow?	W = 343.5, $p < 0.001$
2. How confident are you in the regional block time-out process in systematically catching mistakes?	W = 313.5, $p < 0.001$
3. How confident are you in detecting the signs of local anesthetic systemic toxicity and performing your role in its treatment?	W = 476, $p = 0.01032$
4. How comfortable are you in determining the appropriate dosage and correctly administering lipid emulsion therapy?	W = 407, $p < 0.001$
5. The regional block time-out process is efficient	W = 129, $p < 0.001$
6. Relevant procedural markings are easily identifiable	W = 375, $p < 0.001$
7. I am confident the holding area is equipped to handle complications like respiratory arrest or seizures	W = 363, $p < 0.001$
8. The holding area's workload hinders me from adequately monitoring patients after they receive a regional block	W = 480, $p = 0.02045$

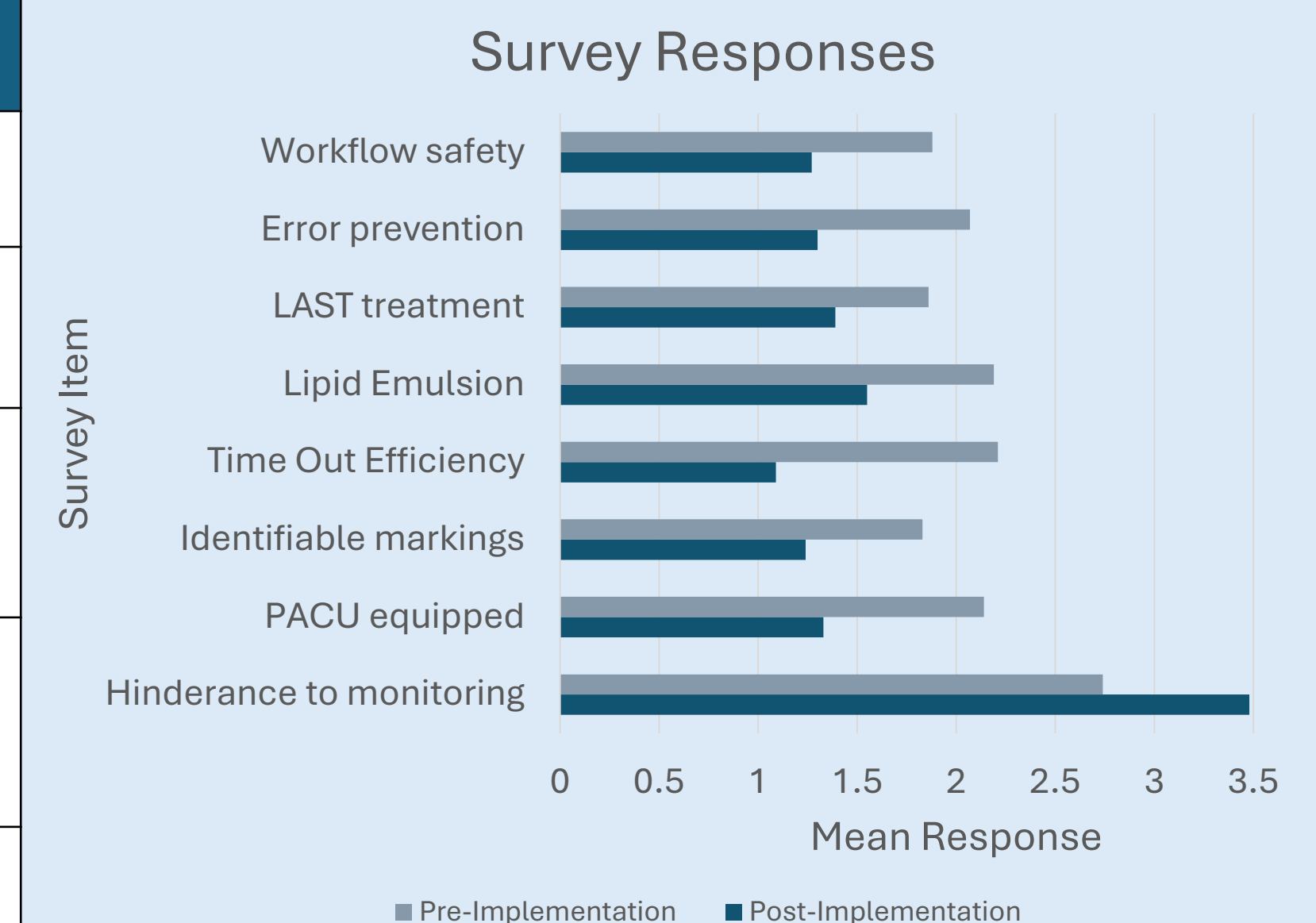


Table 2. Summary of the 8 Likert scale survey items assessed pre- and post-implementation, and corresponding Mann-Whitney U test statistic and p-value.

Figure 2. Summary of 5-point Likert scale survey item responses before and after implementation. Items 1–4 assessed confidence (1 = **Very confident**, 5 = **No confidence**), while items 5–8 measured agreement with the statement (1 = **Strongly agree**, 5 = **Strongly disagree**).

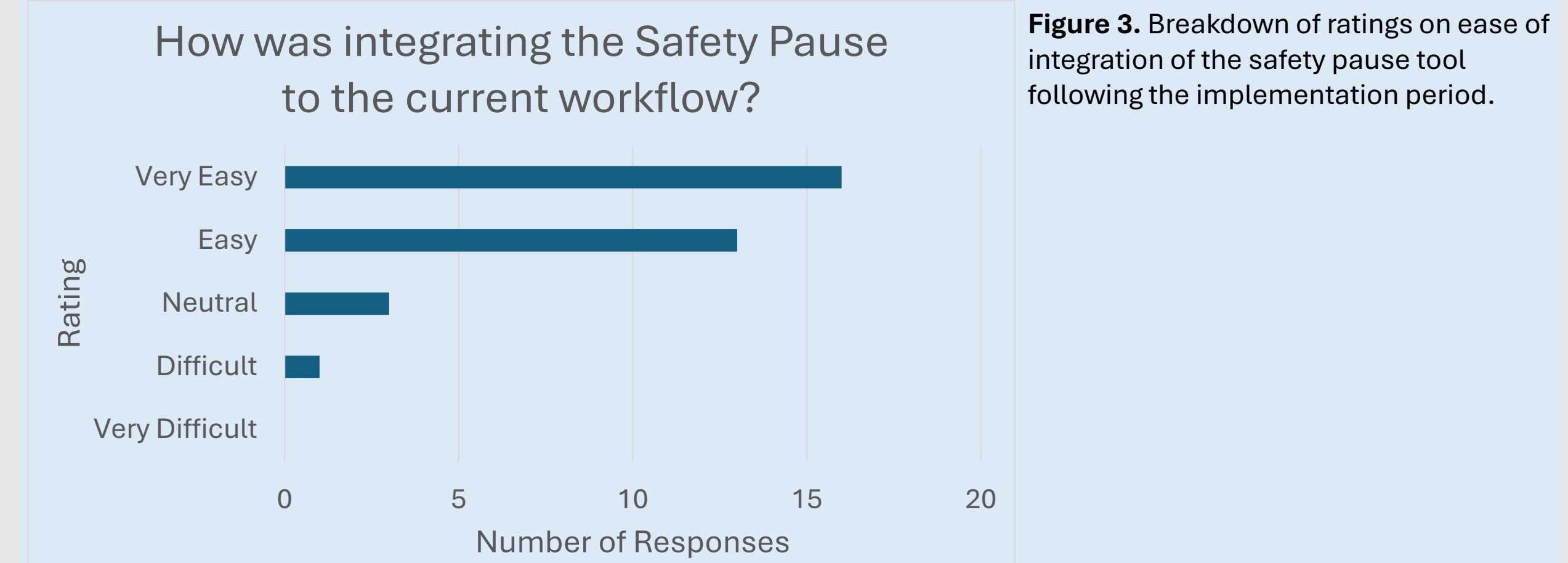


Figure 3. Breakdown of ratings on ease of integration of the safety pause tool following the implementation period.

Discussion

- The Safety Pause tool was developed to enhance patient safety in RNBs.
- Provider confidence in safety measures, error prevention, and workflow efficiency significantly improved post-implementation.
- 87.9% of respondents found the tool easy to integrate, and significant gains were seen in confidence related to procedural markings, error detection, and anesthetic toxicity management.
- The Safety Pause helped avert a wrong-sided block and has caught several instances of missing IVs and bag valve masks.
- The tool strengthens adherence to safety protocols, enhances provider preparedness for complications, and fosters a stronger culture of safety in regional anesthesia. Its structured approach could be adapted for wider use in perioperative and procedural settings.

References

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