An Educational Initiative to Increase Anesthesia Providers Use of Quantitative Neuromuscular Monitoring

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Background

Yearly, 30.8 million surgical patients are administered neuromuscular blocking agents (NMBAs) in the United States (Brull & Kopman, 2017). NMBAs are administered to facilitate endotracheal intubation and provide skeletal muscle relaxation improving patient safety and operating conditions (Naglehout, 2014).

Residual neuromuscular blockade (rNMB) results from inadequate recovery from NMBAs and can result in generalized weakness, respiratory depression, airway obstruction, increased risk of aspiration, dysphasia, pneumonia, and postoperative respiratory failure in the surgical patient (Bedsworth et al., 2019).

Despite an abundance of evidence that postoperative residual weakness is prevalent and exposes patients to significant risk, many anesthesia providers fail to employ adequate quantitative neuromuscular monitoring (QNM) when utilizing nondepolarizing neuromuscular medications.

Objectives

Aim: To increase provider knowledge and overall use of intraoperative QNM through an evidence-based educational session and Quick Look Guide.
Objectives: To close the knowledge gap regarding the use of QNM that exists among providers that is contributing to the lack of use of the QNM.
PICO Question: In anesthesia providers, does an educational initiative regarding QNM improve the intraoperative use of this technology over a six-week period following the presentation?

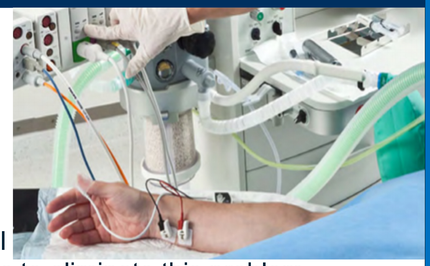
Methodology

Databases:
- CINAHL, MEDLINE, Ebscohost, Google Scholar

Keywords:
- Residual muscular blockade, quantitative neuromuscular monitoring, nondepolarizing neuromuscular blockers, medications, anesthesia providers, train of four (TOF), peripheral nerve stimulator

Results:
- 89 publications
- 5 studies to answer the PICO question

Recommendations for Practice



Anesthesia professionals utilizing evidence-based findings in their clinical decision making will provide a safe clinical environment for patients in their care (Lehane et al., 2019).

Expert consensus is that patients receiving NMBAs should receive QNM (Naguib et al., 2010).

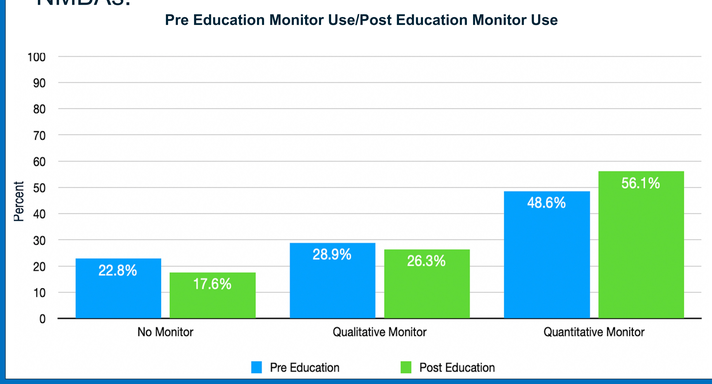
RNMB in the postoperative period is a patient safety hazard that will ultimately require QNM along with traditional subjective observations to eliminate this problem completely (Stoelting, 2016).

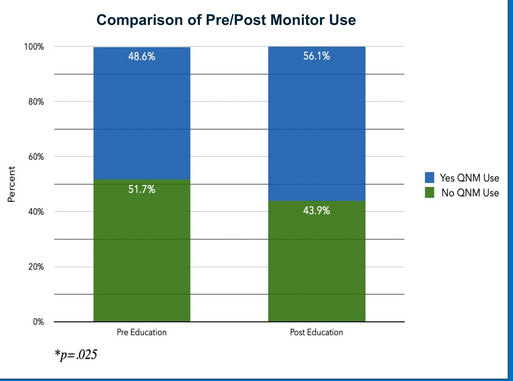
Educational deficits related to QNM are as follows:
- Mechanism of action and pharmacology of muscle relaxants.
- RNMB and signs of inadequate reversal and its negative effects.
- Use of the quantitative neuromuscular monitoring technology (Todd et al., 2014).

Extensive education efforts with repeated feedback has been shown to sustain the use of QNM in clinical practice (Todd et al., 2014).

Translation

- A 30-minute educational session regarding neuromuscular blocking medications, rNMB and its negative effects, and the use of the Philips IntelleVue neuromuscular monitoring technology, was presented face-to-face and streamed virtually to 21 anesthesia team members.
- A Quick Look Guide, serving as a cognitive aid to standardize information and help facilitate decision-making about common troubleshooting issues related to the QNM was laminated and placed in the operating rooms.
- Following the educational session, participants were asked using a 5-point Likert scale (rarely to always) to determine commonly encountered QNM troubleshooting issues, the participants currents practice, and their likelihood to change their practice after completion of the educational initiative.
- An electronic review of the anesthesia record was conducted 6 weeks prior to and after the session to determine the number of surgery cases performed using QNM in the presence of the administration of NMBAs.





*p=.025

Conclusion

It is imperative for anesthesia providers to deliver safe, evidence-based care to avoid unwarranted negative patient outcomes that can contribute to increased healthcare costs.

Expert consensus is that patients receiving NMBAs should receive QNM monitoring (Naguib et al., 2010), however providers report that they encounter technological difficulties and failed calibrations when using the technology. This is concerning and may be a reason for reluctance to use the technology.

The educational initiative was effective as 81% of the providers reported they would change their practice, and the chart review revealed that the utilization of the QNM increased by 7.5% among clinicians and analysis showed that this increase was statistically significant.

The Quick Look Guide placed in all operating rooms containing troubleshooting tips for the technology was reported by providers to be, “A nice resource that helped troubleshooting.”

Limitations:
- Convenience sampling
- Small sample size
- Time constraints for educational presentation

Implications for future practice would be to continue yearly education on the patient safety concerns of rNMB and the use of the QNM device.

References