Increasing Use of Quantitative Train-of-Four

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The Problem

Despite residual neuromuscular paralysis becoming a widely acknowledged problem in the field of Anesthesia, it is still under-recognized by providers. In 2011, the Anesthesia Patient Safety Foundation (APSF), an independent multidisciplinary organization created to help avoid preventable adverse clinical outcomes reported that 90% of surveyed anesthesia providers agreed that objective functional monitoring (twitch measurement) should be utilized routinely intraoperatively for patients receiving neuromuscular blocking drugs (NMBDs) prior to transfer to the Post-Anesthesia Care Unit (PACU).

Project Goal

Residents will have at least 50% compliance with the accurate use of a Datex-Ohmeda Neuromuscular Transmission (NMT) module providing a quantitative measurement of Train-Of-Four (TOF) during surgical cases requiring paralysis for which patients:

- Are intubated without rapid sequence intubation
- Do not have difficult airways
- Are extubated at the end of surgery
- Meet American Society of Anesthesiology Classification 1-5
- Are greater than 17 years old.

Project Plan

- Create and distribute a checklist pocket card detailing simple steps to properly use the NMT module (including positioning of leads on the patient’s hand, obtaining supramaximal stimulus, and other common pitfalls in the use of the monitor).

Lessons Learned

- Using equipment and infrastructure which already existed and was already being used by at least a fraction of our residents facilitated implementation
- Constructing a report with the level of complexity that our case audit required took much longer than anticipated for multiple reasons including the IT needs of the Mission Bay campus opening in Feb 2015.

Progress to Date

Although we were successful in achieving our goals of at least 50% use of NMT modules in applicable surgical cases, collecting data was limited by our manual audit of over 4000 OR cases per month. Therefore these results only reflect 300-400 cases per quarter.

Moving Forward

In the future, we would like to investigate whether the increased use of NMT modules has improved the incidence of residual neuromuscular blockade in the PACU. This would include all complications from residual neuromuscular blockade including use of non-invasive ventilatory support, re-intubations, as well as aspiration. Of course, given this is neither a randomized nor blinded study, attributing any improvement to our intervention will be difficult, however exploring this question may yield additional quality improvement project ideas.

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