

ASPIRE Featured Measure

Train of Four Monitor Documented After Last Dose of Non-depolarizing Neuromuscular Blocker: NMB 01

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Introduction

ASPIRE (Anesthesiology Performance Improvement and Reporting Exchange) is a national anesthesia quality improvement collaborative that includes 21 hospitals across Michigan. Michigan hospitals are a core component of ASPIRE and make up almost half of all participating sites. We are pleased to share our 2nd featured measure article, as part of our ongoing collaboration with the MSA.

An important focus for ASPIRE over the last 2 years has been reducing respiratory complications among patients undergoing general anesthesia with mechanical ventilation. ASPIRE has built 4 measures that, collectively can track processes of care that reduce perioperative pulmonary complications. These measures are:

1. Maintaining tidal volumes at ≤ 8 cc/kg ideal body weight (PUL 02)
2. Maintaining positive end expiratory pressure (PUL 03)
3. Appropriate neuromuscular monitoring (NMB 01)
4. Appropriate neuromuscular blockade reversal (NMB 02)

In this issue, we discuss information and performance for our neuromuscular monitoring measure.

Appropriate Neuromuscular Monitoring

NMB 01 measures train of four (TOF) monitoring. More specifically, the percentage of cases using a non-depolarizing neuromuscular blocker that have a TOF documented after the last dose of neuromuscular blocker and prior to earliest extubation.

Postoperative residual neuromuscular blockade can lead to significant complications. Several studies have found associations between the use of neuromuscular blockade agents (NMBA) and residual neuromuscular blockade in the recovery room. Adverse postoperative respiratory outcomes are even more frequent when patients receive NMBA and reversal agents are not used. A mainstay of residual blockade prevention continues to be TOF monitoring to allow for detection, and use of reversal agents like neostigmine and sugammadex. Clinical measures, such as head lift and grip strength, are ineffective measures of muscle recovery. Due to variability in duration of muscle relaxants, even in defasciculating doses, ASPIRE recommends that TOF is monitored when any non-depolarizing neuromuscular blockers are administered.¹⁻⁷

Exclusion criteria for this measure include cardiac procedures where patients are expected to go to ICU intubated. Additional measure details can be found at https://mpog.org/files/quality/measure/NMB-01_spec.pdf.

Figure A. Performance for NMB 01 Across ASPIRE sites in Michigan- 2019

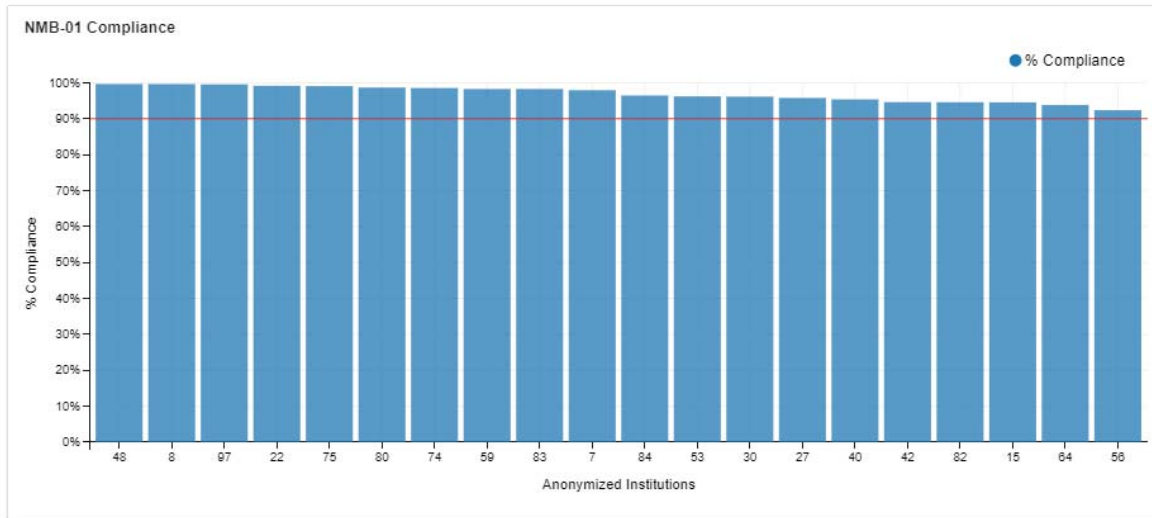
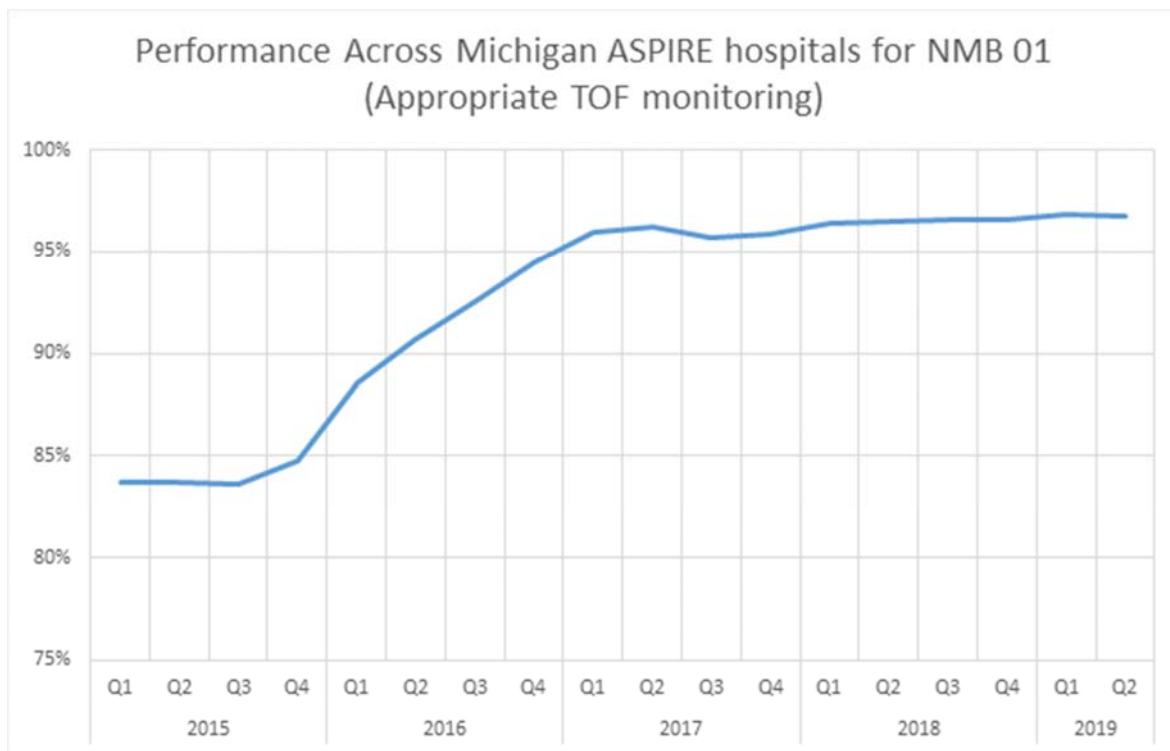


Figure B. Performance trend for ASPIRE sites in Michigan since the release of NMB 01



Discussion

ASPIRE sites participating in Michigan (and around the country) have used a variety of quality improvement techniques to improve their performance. These include adding train of four monitors to every operating room, ensuring replacement batteries for monitors are readily available, introducing quantitative monitoring devices, providing performance feedback to individual providers, and sharing best practices via lecture and discussion sessions. Tools are available from a variety of sources, including our website (<https://mpog.org/quality/toolkits/>). We are encouraged that overall, performance across ASPIRE sites is consistently high, and hope that sites that are not participating in ASPIRE will be able to use this vignette, and access additional information on our website (see links above) to address this important topic.

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