



Measure Abbreviation: NMB 02

Measure Description: Administration of neostigmine, Sugammadex, and/or edrophonium before extubation for cases with nondepolarizing neuromuscular blockade

NQS Domain: Effective Clinical Care

Measure Type: Process

Measure Summary: The neuromuscular blocker reversal measure tells you the percentage of your patients that receive a reversal agent after you have given a non-depolarizing neuromuscular blocker. The purpose of this quality measure is to help reduce the number of patients who have residual neuromuscular blockade after extubation. To account for cases where a dose of muscle relaxant was given early in the case, and then not redosed, this measure does not require that neostigmine to be given if a non-depolarizer was not administered for 3 hours before extubation for adults and 2 hours for pediatric patients.

Inclusions:

All patients that have received either by bolus or infusion a non-depolarizing neuromuscular blocker (NMB) AND were extubated post-operatively. The following NMBs were included:

- Atracurium
- Cisatracurium
- Pancuronium
- Rocuronium
- Vecuronium

Exclusions:

- ASA 5 and 6 cases.
- Patients that were not extubated in the immediate post-operative period.
- Patients not given NMBs.
- Cardiac surgery without pump (CPT: 00560)
- Cardiac surgery with pump and <1 year old (CPT: 00561)
- Cardiac surgery with pump and > 1 year old (CPT: 00562)
- Cardiac surgery with hypothermic arrest (CPT: 00563)
- CABG with pump (CPT: 00567)
- Heart Transplant (CPT: 00580)
- Cases where patients (age > 12) received defasciculating doses of
 - Vecuronium \leq 1mg
 - Cisatracurium \leq 2mg
 - Rocuronium \leq 10 mg

Exclusions (continued):

- Any cardiac case with an intraoperative note mapped to one of the following MPOG Concepts:
 - 50399 Cardiopulmonary bypass -- aortic clamp on/off note
 - 50409 Cardiopulmonary bypass terminated
 - 50410 Cardiopulmonary bypass initiated (full)
 - 50416 Cardiopulmonary bypass -- crossclamp and circulatory arrest time totals
 - 50417 Cardiopulmonary bypass -- Access cannula removed note
 - 50714 Cardiopulmonary bypass - Bypass start / stop event
- Cases performed by cardiac surgical service: MPOG concept 80005.

Success:

- Documentation of neostigmine, Sugammadex, and/or edrophonium before earliest extubation.
OR
- A period of greater than 3 hours exists between last dose of non-depolarizing medication and extubation for patients ≥ 12 years old.
OR
- A period of greater than 2 hours exists between last dose of non-depolarizing medication and extubation for patients <12 years old.
OR
- An acceleromyography ratio of ≥ 0.9 documented after last dose of NMB and before earliest extubation.

Threshold: 90%.

Responsible Provider: The provider(s) signed in at time of earliest extubation.

Risk Adjustment (for outcome measures):

Not applicable.

References:

1. McLean DJ, Diaz-Gil D, Farhan HN, Ladha KS, Kurth T, Eikermann M. Dose-dependent Association between Intermediate-acting Neuromuscular-blocking Agents and Postoperative Respiratory Complications. *Anesthesiology*. 2015;122(6):1201-1213.
2. Murphy GS, Szokol JW, Avram MJ, et al. Residual Neuromuscular Block in the Elderly: Incidence and Clinical Implications. *Anesthesiology*. 2015;123(6):1322-1336.
3. Brull SJ, Murphy GS. Residual neuromuscular block: lessons unlearned. Part II: methods to reduce the risk of residual weakness. *Anesthesia and analgesia*. 2010;111(1):129-140.
4. Bulka CM, Terekhov MA, Martin BJ, Dmochowski RR, Hayes RM, Ehrenfeld JM. Nondepolarizing Neuromuscular Blocking Agents, Reversal, and Risk of Postoperative Pneumonia. *Anesthesiology*. 2016;125(4):647-655.
5. Lien CA, Kopman AF. Current recommendations for monitoring depth of neuromuscular blockade. *Current opinion in anaesthesiology*. 2014;27(6):616-622.