



Measure Abbreviation: NMB 02

Data Collection Method: This measure is calculated based on data extracted from the electronic medical record combined with administrative data sources such as professional fee and discharge diagnoses data. This measure is explicitly not based on provider self-attestation.

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)

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- Cases where patients (age > 12) received defasciculating doses of
 - Vecuronium ≤ 1mg
 - Cisatracurium ≤ 2mg
 - Rocuronium ≤ 10 mg
- 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.