Measure Abbreviation: NMB 01

Description: Percentage of cases with a documented Train of Four (TOF) after last dose of non-depolarizing neuromuscular blocker.

NQS Domain: Effective Clinical Care

Measure Type: Process

Scope: Calculated on a per case basis.

Measure Summary: NMB 01 is a monitoring measure that identifies the percentage of cases that had a documented Train of Four or acceleromyography result after the last dose of 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.

Rationale: 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 monitoring to allow for detection, and use of reversal agents like neostigmine and sugammadex. Due to variability in duration of muscle relaxants, even in defasciculating doses, we recommend that TOF is monitored when any non-depolarizing neuromuscular blockers are administered.

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

- Atracurium
- Cisatracurium
- Pancuronium
- Rocuronium
- Vecuronium

Older drugs (Mivacurium and Doxacurium) were not included.

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)
Exclusions (continued):

- Cardiac surgery with hypothermic arrest (CPT: 00563)
- CABG with pump (CPT: 00567)
- Heart Transplant (CPT: 00580)
- 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.

MPOG Concept IDs Required:

<table>
<thead>
<tr>
<th>Neuromuscular Blocker Medications MPOG Concept IDs</th>
<th>Extubation MPOG Concept IDs</th>
<th>Train of Four MPOG Concept IDs</th>
<th>Neuromuscular Reversal Agent MPOG Concept IDs</th>
</tr>
</thead>
<tbody>
<tr>
<td>10043 Atracurium</td>
<td>50127 Intubation Extubated Awake or Deep</td>
<td>3330 Train-of-four (Subjective assessment)</td>
<td>10739 Sugammadex</td>
</tr>
<tr>
<td>10129 Cisatracurium</td>
<td>50202 Emergence-Patient Extubated</td>
<td>3485 Train-of-four (Acceleromyography)</td>
<td></td>
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<tr>
<td>10344 Pancuronium</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>10393 Rocuronium</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>10446 Vecuronium</td>
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<td></td>
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</tr>
</tbody>
</table>

Data Diagnostics Affected:

- Percentage of Cases with a Non-Depolarizing NMB Administration
- Percentage of Cases with an Extubation Note
- Percentage of Cases with a Train of Four Observation
- Percentage of Cases with any Staff Tracking
- Percentage of Anesthesia Provider Sign-Ins that are Timed

Failed Case Grid Template:

<table>
<thead>
<tr>
<th>Failed NMB-01 Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Link to Case</td>
</tr>
</tbody>
</table>
Case Viewer Template:

**Success:** Documentation of a Train of Four count (1, 2, 3, or 4), sustained tetany, or TOF ratio provided by acceleromyography AFTER last dose or stopping of infusion of neuromuscular blocker and before earliest extubation. **Note:** A Train of Four value of ‘0’ is accepted for cases in which sugammadex is administered for reversal.

**Threshold:** 90%.

**Responsible Provider:** The provider signed in at time of earliest extubation.

**Risk Adjustment (for outcome measures):**

*Not applicable.*

**References:**


