Measure Abbreviation: PUL 03

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

Description: Percentage of cases in which Positive End Expiratory Pressure (PEEP) is used for patients undergoing mechanical ventilation during anesthesia.

Measure Time Period: Case start to case end (see other measure build details)

Measure Type: Process

Measure Summary: PUL 03 is an informational measure that analyzes PEEP usage across patients undergoing mechanical ventilation during anesthesia. PUL 03 will determine if PEEP was administered (as defined by median PEEP ≥ 2) and also analyze distribution of PEEP levels:

- No PEEP (<2 cm H₂O)
- Low PEEP (2–4 cm H₂O)
- Moderate PEEP (≥ 4 to < 8 cm H₂O)
- High PEEP (≥8 cm H₂O)

Rationale: The use of lung protective ventilation techniques (low tidal volumes and positive end expiratory pressure) should be part of standard anesthetic practice for most cases that require positive pressure ventilation. Several randomized controlled trials, as well as a meta-analysis in 2015 describe the benefit with low vs high tidal volume techniques and use of PEEP.1–6 Unfortunately, there is not enough evidence to suggest specific PEEP levels. Therefore, specific threshold indicators will not be defined for PUL 03 initially.

Inclusions:
Patients undergoing endotracheal intubation.

Exclusions:
- ASA 5 and 6 cases
- Patients < 12 years of age
- Patients <20kg.
- Cases in which patients are mechanically ventilated for less than 45 cumulative minutes.
- One lung ventilation procedures as indicated by intraoperative notes or note details mapped to one of the following MPOG concepts:
  - 50501: Thoracic: Single-lung ventilation
  - 50202: Thoracic: Single-lung ventilation, side detail
MPOG Concept IDs Required:

<table>
<thead>
<tr>
<th>Endotracheal Tube MPOG Concept IDs</th>
<th>PEEP, PIP, and TV MPOG Concept IDs</th>
<th>One Lung Ventilation MPOG Concept IDs</th>
</tr>
</thead>
<tbody>
<tr>
<td>50121    Intubation Endotracheal Tube Stylet Used</td>
<td>3210  Positive End Expiratory Pressure-Measured</td>
<td>50501 Thoracic-Single lung ventilation</td>
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<tr>
<td>50122    Intubation Endotracheal Tube Size</td>
<td>3212  Positive End Expiratory Pressure-Set</td>
<td>50202 Thoracic-Single lung ventilation side detail</td>
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<tr>
<td>50123    Intubation Endotracheal Tube Type</td>
<td>3185  Peak Inspiratory Pressure</td>
<td></td>
</tr>
<tr>
<td>50124    Intubation Endotracheal Tube Secured Mechanism</td>
<td>3190  Tidal Volume Actual</td>
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</tr>
<tr>
<td>50125    Intubation Endotracheal Tube Secured Distance</td>
<td>3192  Tidal Volume Set</td>
<td></td>
</tr>
<tr>
<td>50126    Intubation Endotracheal Tube Secured Reference Point</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50202    Emergence-Patient Extubated</td>
<td></td>
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<tr>
<td>50205    Intubation Tube Note</td>
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<tr>
<td>50671    Intubation-endotracheal tube in situ</td>
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</tr>
</tbody>
</table>

Data Diagnostics Affected:
(PUL 03) Measure Specification Page 3 of 4

- Percentage of Cases with Any Physiologic Observation
- Percentage of Physiologic Observations with a Meaningful Type Mapping
- Percentage of Cases with a PEEP Observation
- Percentage of Cases with an Intubation Note
- Percentage of Cases with Percentage of Cases with any Staff Tracking
- Percentage of Anesthesia Provider Sign-Ins that are Timed

Phenotypes Used:
- AnesthesiaEnd
- AsaNotes
- MpogCaseId
- StaffRoles
- Asa5or6
- EndotrachealTube
- PrimaryProvider

Other Measure Build Details:

- If no weight is recorded, the case is included.

- For a case to be included, there must be at least 45 cumulative minutes of actual tidal volume or 45 minutes of set tidal volume (if actual is not present).

  - For a given case, this measure will exclude periods when patients are not under positive pressure ventilation (as defined by peak inspiratory pressure – positive end expiratory pressure of ≤ 6).

    - Peak Inspiratory Pressure determined by values mapped to MPOG Concept 3185.

    - PEEP will be determined using values associated with the following variables:

      1. Use Measured PEEP (MPOG Concept: 3210). If not documented,
      2. Use Set PEEP (MPOG Concept: 3212). If not documented,
      3. Assume PEEP = 0.

- Median PEEP will be determined using values associated with the following variables:

  1. Use Measured PEEP. If not documented,
  2. Use Set PEEP. If not documented,
  3. Determine no PEEP data available.

- PEEP values before case start, after case end, and during periods where PIP - PEEP ≤ 6 are not included in calculating the median.

Algorithm for determining Measure Start/End Times:
Measure Start Time:

Case Start
1. Anesthesia Induction End. If not available, then
2. Anesthesia Induction Begin. If not available, then
3. Procedure Start. If not available, then
4. Patient in Room. If not available, then
5. Anesthesia Start

Measure End Time:

Case End
1. Patient Extubated. If not available, then
2. Procedure End. If not available, then
3. Patient Out of Room. If not available, then
4. Anesthesia End

Success: Median PEEP ≥ 2 cm H₂O (Assuming values less than 2 cm H₂O is equivalent to no PEEP administered) for the time period between Case Start and Case End.

Threshold: This measure is informational only- threshold not yet defined by the MPOG Quality Committee.

Responsible Provider: This measure is informational only. Attribution not yet determined by the MPOG Quality Committee.

Method for determining Responsible Provider: Not applicable.

Risk Adjustment (for outcome measures): Not applicable.

References: