Pediatric Ventilator-associated Event (PedVAE)

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Division of Healthcare Quality Promotion

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Today’s Training Goals

- Review the History and Development of PedVAE
- Review PedVAE Key Terms and How to Select Daily Minimum Values
- Review the PedVAE Surveillance Algorithm
- Review the Use of the PedVAE Calculator
Ventilated Patients and the Need for Surveillance

- Ventilated patients are at high risk for complications and poor outcomes
  - Ventilator-associated pneumonia (VAP), sepsis, Acute Respiratory Distress Syndrome (ARDS), pulmonary embolism, barotrauma, and pulmonary edema
- Such complications can lead to longer duration of mechanical ventilation, longer stays in the ICU and hospital, increased healthcare costs, and increased risk of disability and death
- In preterm neonates, prolonged mechanical ventilation for respiratory distress syndrome can contribute to the development of chronic lung disease
- Prolonged mechanical ventilation in extremely low birthweight infants is also associated with neurodevelopmental delay
Pediatric Ventilator-associated Event Surveillance

- **Neonatal & Pediatric VAE Surveillance Working Group** convened 2012 to explore use of VAE (adult algorithm) in pediatric and neonatal inpatient locations
  - Insufficient data to use the same approach as used for adults
  - January 2014 *in-plan* surveillance for ventilator-associated pneumonia (PNEU/VAP) removed for neonatal locations.
  - PNEU/VAP surveillance only available in pediatric inpatient locations (pedVAP)
Pediatric Ventilator-associated Event Surveillance

- Publication* in 2016 on the use of a pediatric VAE-like definition demonstrated detection of events defined by changes in FiO$_2$ and Mean Airway Pressure were associated with increases in length of stay and mortality.

Pediatric Ventilator-associated Event Surveillance (cont’d)

- Working Group consensus reached to begin development with a plan to implement PedVAE as an available event in NHSN

- PedVAE field testing conducted in 2017

- Available as an event beginning January 2019
PedVAE Surveillance
Where do I find the PedVAE Protocol?
Acute Care, Long-term Acute Care, Inpatient Rehabilitation......
Surveillance for Pediatric Ventilator-associated Events

PedVAE surveillance is available in-plan for pediatric and neonatal inpatient locations only. PedVAP surveillance using the PNREU protocol continues to be available for in-plan surveillance for pediatric locations only.

The Pediatric Ventilator-Associated Event Calculator (must have javascript enabled) operates based upon the currently posted PedVAE protocol.

Resources for NHSN Users Already Enrolled

- Training
- Protocols
- Frequently Asked Questions
- Data Collection Forms
- Supporting Materials
- Calculator
- Analysis Resources

Resources to Help Prevent Infections

Resources for NHSN Users Already Enrolled

Training

Protocols

- Pediatric Ventilator-Associated Event (PedVAE) Protocol, January 2019 (PDF – 600 KB)
- NHSN Overview January 2019 (PDF – 350 KB)
- Identifying Healthcare-associated Infections (HAIs) in NHSN, January 2019 (PDF – 1 MB)
- Patient Safety Monthly Reporting Plan, January 2019 (PDF – 250 KB)

Frequently Asked Questions

New! 2019 FAQs:

- FAQs: Pediatric Ventilator-Associated Events (PedVAE)
- FAQs: Analysis
- FAQs: Annual Surveys
- FAQs: Locations
- FAQs: Miscellaneous
- FAQs: CDA

Data Collection Forms

Supporting Materials

Calculator

Pediatric Ventilator-Associated Event Calculator (javascript must be enabled)

Analysis Resources
FAQs: Pediatric Ventilator–Associated Events (PedVAE)

**On This Page**

- Excluded Ventilator Modes
- Weaning/Mechanical Ventilation Liberation Trials and PedVAE
- Daily Minimum Values
- Pneumonia present on admission or prior to initiation of ventilation and PedVAE surveillance
- Lower Respiratory Tract Events
- Secondary BSI to lower respiratory events in locations performing PedVAE surveillance
- Episode of Mechanical Ventilation
- Location of Mechanical Ventilation
- Date of Mechanical Ventilation
- Home Ventilators
- Ventilator

11 Topics
13 Questions
Who is eligible for PedVAE surveillance?

- Ventilated inpatients of acute care hospitals, long term acute care hospitals, inpatient rehabilitation facilities
- Patients in pediatric and neonatal locations only where denominator data (patient days and ventilator days) can be collected
  - Ventilated adults in pediatric locations are included in PedVAE surveillance – regardless of age
Who is NOT eligible for PedVAE surveillance?

- Patients on extracorporeal life support or paracorporeal membrane oxygenation are **not eligible** for VAE surveillance
  - Ineligibility only applies to periods of time while receiving this form of support

- Non-acute care locations in acute care facilities are not eligible to participate in PedVAE surveillance.
What about other specific modes of mechanical ventilation?

- **INCLUDE** patients on:
  - High Frequency Oscillatory or jet ventilation (HFO)
  - Airway Pressure Release Ventilation (APRV)
  - Volumetric Diffusive Respiration (VDR) – \( \text{FiO}_2 \) parameter only

- **INCLUDE** patients who are receiving a conventional mode of mechanical ventilation while receiving:
  - Surfactant
  - Corticosteroids
  - Prone positioning
  - Nitric oxide therapy
  - Helium-oxygen mixture
  - Epoprostenol therapy
PedVAE Algorithm Overview

***The PedVAE definition algorithm is for use in surveillance; it is not a clinical definition algorithm and is not intended for use in the clinical management of patients.***
PedVAE Definition Algorithm Summary

1. Patient on mechanical ventilation > 2 days

2. Baseline period of stability or improvement, followed by sustained period of worsening oxygenation

3. Pediatric Ventilator-Associated Event (PedVAE)
PedVAEs are determined by identification of deterioration in respiratory status after a period of stability or improvement on the ventilator

- Using either of two key parameters that demonstrate effective oxygenation in ventilated patients
  - $\text{FiO}_2$
  - Mean Airway Pressure (MAP)
FiO₂

- Fraction of Oxygen in inspired gas
  - FiO₂ of room air is 0.21
  - Oxygen concentration of room air is 21%.

- FiO₂ is a setting on the ventilator and is one of the key parameters that can be adjusted depending on the patients oxygenation requirement.
**MAP**

- Mean Airway Pressure—Mean (average) pressure exerted on the airway and lungs from the beginning of inspiration until the beginning of the next inspiration (inspiratory cycle)
- MAP is a measured/calculated value (not a ventilator setting) that is determined by
  - PEEP - Peak End-Expiratory Pressure
  - PIP- Peak Inspiratory Pressure
  - Inspiratory time
  - Other parameters like flow or frequency
- MAP for purposes of PedVAE surveillance is **NOT** Mean Arterial Pressure
FiO₂ and MAP

- FiO₂ ventilator settings and MAP values documented across the calendar day are used to identify the daily minimum FiO₂ and daily minimum MAP values.
- The daily minimum FiO₂ and daily minimum MAP values are used to determine both the period of stability or improvement and the period that indicates worsening oxygenation.
- Stability, improvement or worsening is not determined by comparing FiO₂ settings and MAP values that occur during a calendar day but by comparing the daily minimum values from calendar to calendar day.
- Use a calendar day not any other “24 hour capture period”
Daily Minimum $\text{FiO}_2$ and MAP

- $\text{FiO}_2$ settings and MAP readings are typically recorded in the paper or electronic medical record, on respiratory therapy and/or nursing flow sheets, in the section of the flow sheet that pertains to respiratory status/mechanical ventilation.

- When choosing the daily minimum $\text{FiO}_2$ and MAP, use all documented findings that are recorded throughout the calendar day during times when the patient is receiving support from an eligible mode of mechanical ventilation.

  - Include $\text{FiO}_2$ and MAP values documented during weaning/mechanical ventilation liberation trials as long as the patient is receiving ventilator support during those trials.

  - Excludes $\text{FiO}_2$ and MAP values documented during periods of time when the patient is on extracorporeal or paracorporeal membrane oxygenation.
Daily Minimum FiO₂

- The daily minimum FiO₂ is defined as the **lowest documented FiO₂ setting that was maintained for > 1 hour during a calendar day**

- Protocol provides examples of how > 1 hour is to be determined to ensure standardization across all facilities
  - If tracking every 15 minutes, 5 consecutive recordings of a certain level would be needed (e.g., at 09:00, 09:15, 09:30, 09:45 and 10:00)
  - If tracking every 30 minutes, 3 consecutive recordings at a certain level would be needed (e.g., at 09:00, 09:30, and 10:00)
  - If tracking PEEP every hour, 2 consecutive recordings at a certain level (e.g., at 09:00 and 10:00)

- If there is no setting that has been maintained for > 1 hour then select the lowest setting regardless of the period of time in which the setting was maintained
Identify the Daily Minimum FiO$_2$ for Monday

Select the lowest value recorded for each calendar day that is maintained for >1 hour

<table>
<thead>
<tr>
<th></th>
<th>Monday 12am</th>
<th>3am</th>
<th>4am</th>
<th>6am</th>
<th>9am</th>
<th>12pm</th>
<th>3pm</th>
<th>9pm</th>
<th>11pm</th>
</tr>
</thead>
<tbody>
<tr>
<td>FiO$_2$</td>
<td>0.80</td>
<td>0.70</td>
<td>0.90</td>
<td>0.80</td>
<td>0.80</td>
<td>0.75</td>
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<td>0.75</td>
<td>0.75</td>
</tr>
</tbody>
</table>
Identify the Daily Minimum FiO$_2$

Select the lowest value recorded for each calendar day that is maintained for $>1$ hour

<table>
<thead>
<tr>
<th></th>
<th>Monday 12am</th>
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<th>6am</th>
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<th>12pm</th>
<th>3pm</th>
<th>9pm</th>
<th>11pm</th>
</tr>
</thead>
<tbody>
<tr>
<td>FiO$_2$</td>
<td>0.80</td>
<td>0.70</td>
<td>0.90</td>
<td>0.80</td>
<td>0.80</td>
<td><strong>0.75</strong></td>
<td>0.75</td>
<td>0.75</td>
<td>0.75</td>
</tr>
</tbody>
</table>

- **Monday**: 0.75 is Daily Minimum FiO$_2$, the lowest value 0.70 was not maintained for $>1$ hour
### Identify the Daily Minimum FiO\textsubscript{2} for Monday and Tuesday

Ventilation is initiated late in the calendar day

<table>
<thead>
<tr>
<th>FiO\textsubscript{2}</th>
<th>Monday 2300</th>
<th>2330</th>
<th>Tuesday 0030</th>
<th>0100</th>
<th>0300</th>
<th>0600</th>
<th>0900</th>
<th>1200</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.70</td>
<td>0.80</td>
<td>0.80</td>
<td>0.80</td>
<td>0.80</td>
<td>0.75</td>
<td>0.75</td>
<td>0.80</td>
<td></td>
</tr>
</tbody>
</table>
Identify the Daily Minimum FiO\textsubscript{2}

Ventilation is initiated late in the calendar day

- **Monday**: 0.70 is the Daily Minimum FiO\textsubscript{2}, there was no value maintained for > 1 hour
- **Tuesday**: 0.75 is the Daily Minimum FiO\textsubscript{2}, the lowest value maintained for > 1 hour
Daily Minimum MAP

- The daily minimum MAP is the **lowest value documented during a calendar day regardless of how long the value is maintained**.

- When determining the daily minimum MAP, if MAP values include a decimal place then round the MAP value to the nearest whole number:
  - A MAP of 10.00 – 10.49 is rounded to 10
  - A MAP of 10.50 – 10.99 is rounded to 11
Daily Minimum MAP

- For patients < 30 days MAP values of 0-8 cmH\(_2\)O are considered equal to 8 cmH\(_2\)O
  - Any day where daily minimum MAP is 0-8 cmH\(_2\)O will be assigned a daily minimum MAP value of 8 cmH\(_2\)O.

- For patients ≥ 30 days MAP values 0-10 cmH\(_2\)O are considered equal to 10 cmH\(_2\)O
  - Any day where daily minimum MAP is 0-10 cmH\(_2\)O will be assigned a daily minimum MAP value of 10 cmH\(_2\)O.
Identify the Daily Minimum MAP for a Patient < 30 Days

<table>
<thead>
<tr>
<th>Monday</th>
<th>12am</th>
<th>3am</th>
<th>6am</th>
<th>9am</th>
<th>12pm</th>
<th>3pm</th>
<th>6pm</th>
<th>9pm</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAP</td>
<td>8</td>
<td>6</td>
<td>8</td>
<td>5</td>
<td>5</td>
<td>8</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>
Identify the Daily Minimum MAP - < 30 Days

Select the lowest value recorded for each calendar day

- Monday: The lowest value is 5 cmH\textsubscript{2}O.
- For patients < 30 days values 0-8 = 8
- **Monday**: Daily Minimum MAP is 8 cmH\textsubscript{2}O
Identify the Daily Minimum MAP for a Patient ≥ 30 Days

<table>
<thead>
<tr>
<th></th>
<th>12am</th>
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<th>6am</th>
<th>9am</th>
<th>12pm</th>
<th>3pm</th>
<th>6pm</th>
<th>9pm</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAP</td>
<td>8</td>
<td>6</td>
<td>8</td>
<td>5</td>
<td>5</td>
<td>8</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>
Identify the Daily Minimum MAP for a Patient ≥ 30 Days

Select the lowest value recorded for each calendar day regardless of how long it was maintained.

<table>
<thead>
<tr>
<th></th>
<th>Monday</th>
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<th></th>
</tr>
</thead>
<tbody>
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<td>12am</td>
<td>3am</td>
<td>6am</td>
<td>9am</td>
<td>12pm</td>
<td>3pm</td>
<td>6pm</td>
</tr>
<tr>
<td>MAP</td>
<td>8</td>
<td>6</td>
<td>8</td>
<td>5 (10)</td>
<td>5</td>
<td>8</td>
<td>10</td>
</tr>
</tbody>
</table>

- Monday: The lowest value is 5 cmH2O.
- For patients ≥ 30 days values 0-10 = 10
- **Monday**: Daily Minimum MAP is 10 cmH2O
### Identify the Daily Minimum MAP

Select the lowest value recorded for each calendar day

Remember to round values

<table>
<thead>
<tr>
<th></th>
<th>Monday 12am</th>
<th>3am</th>
<th>6am</th>
<th>9am</th>
<th>12pm</th>
<th>3pm</th>
<th>6pm</th>
<th>9pm</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAP</td>
<td>12.4</td>
<td>12.1</td>
<td>12.9</td>
<td>11.8</td>
<td>12.4</td>
<td>12.0</td>
<td>12.7</td>
<td>12.7</td>
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<tr>
<td>12</td>
<td>12</td>
<td>12</td>
<td>13</td>
<td><strong>12</strong></td>
<td>12</td>
<td>12</td>
<td>13</td>
<td>13</td>
</tr>
</tbody>
</table>

- **Monday**: Daily Minimum MAP is 12 cmH2O
**Figure 1: Pediatric Ventilator-Associated Events (PedVAE) Surveillance Algorithm**

Patient has a baseline period of stability or improvement on the ventilator, defined by ≥ 2 calendar days of stable or decreasing daily minimum* FiO₂ or MAP values. The baseline period is defined as the 2 calendar days immediately preceding the first day of increased daily minimum MAP or FiO₂.

*Daily minimum FiO₂ is defined as the lowest value of FiO₂ documented during a calendar day that is maintained for > 1 hour.
Daily minimum MAP is the lowest value documented during the calendar day.
For patients <30 days old, daily minimum MAP values 0-8 cmH₂O are considered equal to 8 cmH₂O for the purposes of surveillance.
For patients ≥30 days old, daily minimum MAP values 0-10 cmH₂O are considered equal to 10 cmH₂O for the purposes of surveillance.

After a period of stability or improvement on the ventilator, the patient has at least one of the following indicators of worsening oxygenation:
1) Increase in daily minimum FiO₂ of ≥ 0.25 (25 points) over the daily minimum FiO₂ of the first day in the baseline period, sustained for ≥ 2 calendar days.
2) Increase in daily minimum MAP values of ≥ 4 cmH₂O over the daily minimum MAP of the first day in the baseline period, sustained for ≥ 2 calendar days.

Pediatric Ventilator-Associated Event (PedVAE)
PedVAE

- Patient must be ventilated > 2 days to be eligible for PedVAE surveillance
  - However, the first two days of mechanical ventilation can establish a baseline period

- Patients must be mechanically ventilated for at least 4 calendar days to fulfill PedVAE criteria (where the day of intubation or initiation of mechanical ventilation is day 1)
  - 2 days of stability or improvement
  - 2 days of evidence of worsening oxygenation
PedVAE Definition Is Met IF:

FiO₂— a baseline period of stability or improvement immediately followed by an increase over the baseline in the daily minimum FiO₂ of $\geq 0.25$ (25%) that is sustained for $\geq 2$ days

OR

MAP—the baseline period of stability or improvement immediately followed by an increase over the baseline in the daily minimum MAP of $\geq 4$ cmH₂O that is sustained for $\geq 2$ days
Daily Minimum MAP

- For patients < 30 days MAP values of 0-8 cmH$_2$O are considered equal to 8 cmH$_2$O
  - Any day where daily minimum MAP is 0-8 cmH$_2$O will be assigned a daily minimum MAP value of 8 cmH$_2$O.
  - Following a ≥ 2 day period of stability at 8 cmH$_2$O an increase in daily minimum MAP to at least 12 cmH$_2$O sustained for at least 2 calendar days is required

- For patients ≥ 30 days MAP values 0-10 cmH$_2$O are considered equal to 10 cmH$_2$O
  - Any day where daily minimum MAP is 0-10 cmH$_2$O will be assigned a daily minimum MAP value of 10 cmH$_2$O.
  - Following a ≥ 2 day period of stability at 10 cmH$_2$O an increase in daily minimum MAP to at least 14 cmH$_2$O sustained for at least 2 calendar days is required
PedVAE Definition

- **Baseline:** ≥ 2 calendar days of *stable or decreasing* daily minimum FiO2 or MAP values and immediately precedes the first day of increased daily minimum MAP or FiO2.

- **Worsening:** After a period of stability or improvement on the ventilator, the patient has at least one of the following indicators of worsening oxygenation:
  
  - Increase in daily minimum FiO2 of ≥ 0.25 *(25 points)* over the daily minimum FiO2 of the *first day in the baseline period*, sustained for ≥ 2 calendar days.

  **OR**

  - Increase in daily minimum MAP values of ≥ 4 cmH2O over the daily minimum MAP of the *first day in the baseline period*, sustained for ≥ 2 calendar days.
Operationalizing PedVAE
(patient is <30 days - MAP values 0-8 = 8 )

<table>
<thead>
<tr>
<th>Vent Day</th>
<th>Daily Minimum MAP</th>
<th>Daily Minimum FiO₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>13</td>
<td>60</td>
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<tr>
<td>2</td>
<td>8 (7)</td>
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Operationalizing PedVAE (patient is < 30 days)

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<tr>
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<th>Daily Minimum FiO₂</th>
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</tbody>
</table>

≥ 2-day period of stability (MAP or FiO₂)
Operationalizing PedVAE
(patient is < 30 days)

<table>
<thead>
<tr>
<th>Vent Day</th>
<th>Daily Minimum MAP</th>
<th>≥ 2-day period of worsening in the MAP parameter with an increase of ≥ 4 cm H₂O over the baseline period</th>
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</thead>
<tbody>
<tr>
<td>1</td>
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</tbody>
</table>
# Operationalizing PedVAE

(patient is < 30 days)

<table>
<thead>
<tr>
<th>Vent Day</th>
<th>MAP min</th>
<th>FiO$_2$ min</th>
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<tbody>
<tr>
<td>1</td>
<td>13</td>
<td>60</td>
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</tbody>
</table>

= PedVAC
## Operationalizing PedVAE

*(patient is ≥ 30 days - MAP values 0 -10 = 10 )*

<table>
<thead>
<tr>
<th>Vent Day</th>
<th>Daily Minimum MAP</th>
<th>Daily Minimum FiO₂</th>
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<tbody>
<tr>
<td>1</td>
<td>13</td>
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≥ 2-day period of worsening in the MAP parameter with an increase of ≥ 4 cm H₂O over the baseline period is not identified
# Operationalizing PedVAE

(patient is $\geq 30$ days - MAP values $0 -10 = 10$)

<table>
<thead>
<tr>
<th>Vent Day</th>
<th>Daily Minimum MAP</th>
<th>Daily Minimum FiO₂</th>
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</thead>
<tbody>
<tr>
<td>1</td>
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<td>60</td>
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<td>14</td>
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<td>8</td>
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</tbody>
</table>

≥ 2-day period of worsening in the MAP parameter with an increase of ≥ 4 cm H₂O over the baseline period is identified

= PedVAC
Operationalizing PedVAE – FiO$_2$

(patient is < 30 days or ≥ 30 days)

<table>
<thead>
<tr>
<th>Vent Day</th>
<th>Daily Minimum MAP</th>
<th>Daily Minimum FiO$_2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>13</td>
<td>60</td>
</tr>
<tr>
<td>2</td>
<td>10 (7)</td>
<td>40</td>
</tr>
<tr>
<td>3</td>
<td>10 (7)</td>
<td>40</td>
</tr>
<tr>
<td>4</td>
<td>12</td>
<td>65</td>
</tr>
<tr>
<td>5</td>
<td>12</td>
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</tr>
<tr>
<td>6</td>
<td>10</td>
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</tr>
<tr>
<td>8</td>
<td>8</td>
<td>40</td>
</tr>
</tbody>
</table>

PedVAC

≥ 0.25 (25%) increase over the baseline period is not sustained for ≥ 2 days
Operationalizing PedVAE – FiO$_2$

(patient is < 30 days or ≥ 30 days)

<table>
<thead>
<tr>
<th>Vent Day</th>
<th>Daily Minimum MAP</th>
<th>Daily Minimum FiO$_2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>13</td>
<td>60</td>
</tr>
<tr>
<td>2</td>
<td>12</td>
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</tr>
<tr>
<td>3</td>
<td>10</td>
<td>40</td>
</tr>
<tr>
<td>4</td>
<td>14</td>
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</tr>
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<td>6</td>
<td>10</td>
<td>40</td>
</tr>
<tr>
<td>7</td>
<td>8</td>
<td>40</td>
</tr>
<tr>
<td>8</td>
<td>8</td>
<td>40</td>
</tr>
</tbody>
</table>

Increase is not ≥ 4 cmH$_2$O over the daily minimum MAP of the first day in the baseline period.
Date of Event / Event Date

- The date of onset of worsening oxygenation (day 1 of the required ≥ 2 day period of worsening oxygenation)
  
  - Earliest date of event for VAE is mechanical ventilation day 3 (first day of worsening oxygenation)
  
  - First possible day that PedVAE criteria can be fulfilled is mechanical ventilation day 4
Date of Event

- Defines the period during which the antimicrobial and pathogen questions apply

- Sets the 14-day PedVAE Event Period
  - Each PedVAE is 14 days in duration (arbitrary—to standardize).
  - Day 1 is the Event Date—so if June 1 is date of onset of worsening oxygenation and a PedVAE is reported, a second PedVAE cannot be detected and reported until June 15.
Reporting Exception related to Date of Event

- If the date of event (date of onset of worsening oxygenation) is on or after the date of documentation of evidence of consent AND the patient is being supported for organ donation purposes, the event should not be reported as a PedVAE.
**Operationalizing PedVAE**

(patient is < 30 days)

<table>
<thead>
<tr>
<th>Vent Day</th>
<th>MAPmin</th>
<th>FiO\textsubscript{2} min</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>13</td>
<td>60</td>
</tr>
<tr>
<td>2</td>
<td>8 (7)</td>
<td>40</td>
</tr>
<tr>
<td>3</td>
<td>8 (7)</td>
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<td>4</td>
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<td>6</td>
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<td>40</td>
</tr>
<tr>
<td>7</td>
<td>8</td>
<td>40</td>
</tr>
<tr>
<td>8</td>
<td>8</td>
<td>40</td>
</tr>
</tbody>
</table>

Event Date = Vent Day 4 (first day of worsening oxygenation)
14 Day event period is Vent Day 4 – Vent Day 17
PedVAE Data Collection Form
# Data Collection Form

* indicates a required field

## Pediatric Ventilator-Associated Event (PedVAE)

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facility ID:</td>
<td></td>
</tr>
<tr>
<td>Patient ID:</td>
<td></td>
</tr>
<tr>
<td>Social Security #:</td>
<td></td>
</tr>
<tr>
<td>Secondary ID:</td>
<td></td>
</tr>
<tr>
<td>Medicare #:</td>
<td></td>
</tr>
<tr>
<td>Patient Name, Last</td>
<td></td>
</tr>
<tr>
<td>First:</td>
<td></td>
</tr>
<tr>
<td>Middle:</td>
<td></td>
</tr>
<tr>
<td>Gender: F M Other</td>
<td></td>
</tr>
<tr>
<td>Date of Birth:</td>
<td></td>
</tr>
<tr>
<td>Ethnicity (Specify):</td>
<td></td>
</tr>
<tr>
<td>Race (Specify):</td>
<td></td>
</tr>
<tr>
<td>Event Type: PedVAE</td>
<td></td>
</tr>
<tr>
<td>Date of Event:</td>
<td></td>
</tr>
<tr>
<td>Post-procedure PedVAE: Yes No</td>
<td></td>
</tr>
<tr>
<td>Date of Procedure:</td>
<td></td>
</tr>
<tr>
<td>NHSN Procedure Code: ICD-10-PCS or CPT Procedure Code:</td>
<td></td>
</tr>
<tr>
<td>MDRO Infection Surveillance:</td>
<td></td>
</tr>
<tr>
<td>Yes, this infection’s pathogen &amp; location are in-plan for Infection Surveillance in the MDRO/CDI Module</td>
<td></td>
</tr>
<tr>
<td>No, this infection’s pathogen &amp; location are not in-plan for Infection Surveillance in the MDRO/CDI Module</td>
<td></td>
</tr>
<tr>
<td>Date Admitted to Facility:</td>
<td></td>
</tr>
<tr>
<td>Location:</td>
<td></td>
</tr>
<tr>
<td>Risk Factors</td>
<td></td>
</tr>
<tr>
<td>Location of Mechanical Ventilation Initiation:</td>
<td>Date Initiated: <strong>/</strong>/____</td>
</tr>
<tr>
<td>NICU: Birth Weight (grams):</td>
<td></td>
</tr>
<tr>
<td>Gestational Age (weeks):</td>
<td></td>
</tr>
<tr>
<td>Event Details</td>
<td></td>
</tr>
<tr>
<td>Specify Criteria Used:</td>
<td></td>
</tr>
<tr>
<td>Daily min FiO2 increase ≥ 0.25 (25 points) for ≥ 2 days†</td>
<td>OR</td>
</tr>
</tbody>
</table>
| Daily min Mean Airway Pressure (MAP) ≥ 4 cm H2O for ≥ 2 days† | after 2+ days of stable or decreasing daily minimum values.
## Data Collection Form (optional data)

<table>
<thead>
<tr>
<th>Clinical event associated with the PedVAE?</th>
<th>□ Yes □ No □ Unknown If Yes, check all that apply:</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Ventilator-associated Pneumonia</td>
<td>□ Sepsis or Septic Shock</td>
</tr>
<tr>
<td>□ Atelectasis</td>
<td>□ Neonatal Respiratory Distress Syndrome (RDS)</td>
</tr>
<tr>
<td>□ Acute Respiratory Distress Syndrome (ARDS)</td>
<td>□ Bronchopulmonary Dysplasia/Chronic Lung Disease</td>
</tr>
<tr>
<td>□ Pulmonary Hypertension</td>
<td>□ Reopened Patent Ductus Arteriosus (PDA)</td>
</tr>
<tr>
<td>□ Pulmonary Edema</td>
<td>□ Weaning from mechanical ventilation or other change in mechanical ventilation approach without clinical worsening</td>
</tr>
<tr>
<td>□ Pulmonary Hemorrhage</td>
<td>□ Other (specify)</td>
</tr>
</tbody>
</table>

### Antimicrobial agent(s) administered?

<table>
<thead>
<tr>
<th>□ Yes □ No</th>
<th>If Yes, select up to 3 antimicrobial agents:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Drug1:_______<strong>; Drug1 start date: <strong>/</strong>/</strong>__</td>
</tr>
<tr>
<td></td>
<td>Drug2:_______<strong>; Drug2 start date: <strong>/</strong>/</strong>__</td>
</tr>
<tr>
<td></td>
<td>Drug3:_______<strong>; Drug3 start date: <strong>/</strong>/</strong>__</td>
</tr>
</tbody>
</table>

### Pathogen identified from one or more of the listed specimen? □ Yes □ No If Yes, specify pathogen on pages 2-3.

- □ Lower Respiratory
- □ Upper Respiratory
- □ Lung Tissue
- □ Pleural Fluid
- □ Urine for *Legionella* or *Streptococcus pneumoniae* antigen testing

### Pathogen identified from BLOOD? □ Yes □ No
Instructions for Completion of Pediatric Ventilator-Associated Event (PedVAE) Form (TOI)

<table>
<thead>
<tr>
<th>Data Field</th>
<th>Instructions for Data Collection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facility ID #</td>
<td>The NHSN-assigned facility ID will be auto-checked by the computer.</td>
</tr>
<tr>
<td>Event #</td>
<td>Event ID number will be auto-checked by the computer.</td>
</tr>
<tr>
<td>Patient ID #</td>
<td>Required. Check the alphanumeric patient ID number. This is the patient identifier assigned by the hospital and may consist of any combination of numbers and/or letters.</td>
</tr>
<tr>
<td>Social Security #</td>
<td>Optional. Check the 9-digit numeric patient Social Security Number.</td>
</tr>
<tr>
<td>Secondary ID #</td>
<td>Optional. Check the alphanumeric ID number assigned by the facility.</td>
</tr>
<tr>
<td>Medicare #</td>
<td>Optional. Enter the patient’s Medicare number.</td>
</tr>
<tr>
<td>Patient Name</td>
<td>Optional. Check the last, first, and middle name of the patient.</td>
</tr>
</tbody>
</table>

https://www.cdc.gov/nhsn/forms/instr/57_113-508.pdf
### PedVAE Application

**Event Details**

<table>
<thead>
<tr>
<th>Specify Criteria Used *</th>
<th>Daily min FiO2 increase ≥ 0.25 (25 points) for ≥ 2 days†</th>
<th>Daily min Mean Airway Pressure (MAP) ≥ 4 cm H2O for ≥ 2 days†</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[ ] Yes</td>
<td>[ ] Yes</td>
</tr>
</tbody>
</table>

* after ≥ 4 days of stable or decreasing daily minimum values

**Clinical event associated with the PedVAE?**

- [ ] Ventilator-associated Pneumonia
- [ ] Atelectasis
- [ ] Acute Respiratory Distress Syndrome (ARDS)
- [ ] Pulmonary Hypertension
- [ ] Pulmonary Edema
- [ ] Pulmonary Hemorrhage
- [ ] Sepsis or Septic Shock
- [ ] Neonatal Respiratory Distress Syndrome (RDS)
- [ ] Bronchopulmonary Dysplasia/Chronic Lung Disease
- [ ] Reopened Patent Ductus Arteriosus (PDA)
- [ ] Weaning from mechanical ventilation or other change in mechanical ventilation approach without clinical worsening
- [ ] Other (specify)

**Antimicrobial agent(s) administered?**

- [ ] Yes

**Pathogen identified from one or more of the listed specimens?**

- [ ] Yes, which specimen type? (check all that apply)
  - [ ] Lower Respiratory
  - [ ] Upper Respiratory
  - [ ] Lung Tissue
  - [ ] Pleural Fluid
  - [ ] Urine for Legionella or Streptococcus pneumoniae antigen testing

**Pathogen identified from BLOOD?**

- [ ] Yes

**Died**

- [ ] Yes

**Discharge Date:**

- [ ] 7

### Custom Fields
Event Details

Specify Criteria Used:
- Daily min FiO2 increase ≥ 0.25 (25 points) for ≥ 2 days
- Daily min Mean Airway Pressure (MAP) ≥ 4 cm H2O for ≥ 2 days

Clinical event associated with the RedVae:
- Yes
  - Ventilator-associated Pneumonia
  - Atelectasis
  - Acute Respiratory Distress Syndrome (ARDS)
  - Pulmonary Hypertension
  - Pulmonary Edema
  - Pulmonary Hemorrhage

Antimicrobial agent(s) administered:

Pathogen identified from one or more of the listed specimens:
- Yes, which specimen type?
  - Lower Respiratory
  - Lung Tissue
  - Urine for Legionella or Streptococcus pneumoniae antigen testing

Pathogen identified from BLOOD:

Died:

Discharge Date:

Custom Fields
Event Details

Specify Criteria Used

- Daily min FiO2 increase ≥ 0.25 (25 points) for ≥ 2 days†
- Daily min Mean Airway Pressure (MAP) ≥ 4 cm H2O for ≥ 2 days†

† after ≥ 2+ days of stable or decreasing daily minimum values

Clinical event associated with the PedVAE?

Y - Yes □
If yes, check all that apply:

- Ventilator-associated Pneumonia
- Atelectasis
- Acute Respiratory Distress Syndrome (ARDS)
- Pulmonary Hypertension
- Pulmonary Edema
- Pulmonary Hemorrhage

Antimicrobial agent(s) administered?

Y - Yes □

Drug 1: _______________________ Drug 1 Start date: ___________________

Drug 2: _______________________ Drug 2 Start date: ___________________

Drug 3: _______________________ Drug 3 Start date: ___________________

Pathogen identified from one or more of the listed specimens?

If Yes, with:

- Lower Respirator
- Lung Tissue
- Urine for Legione

Pathogen identified from BLOOD?

- Yes □

Died: □

Discharge Date: ___________________

Event Details:
Antimicrobial Agent Administered

Drug

Optional. Check Y if antimicrobial agent(s) listed in the Appendix was administered on the event day or within the 2 days before or 2 days after the event date. Otherwise check N. If antimicrobial agent(s) administered = Y Record Drug (up to 3) and enter administration start date. Administration start date is limited to 1 year prior to current admission date.
Event Details

Specify Criteria Used:

- Daily min FiO2 increase ≥ 0.25 (25 points) for ≥ 2 days†
- Daily min Mean Airway Pressure (MAP) ≥ 4 cmH2O for ≥ 2 days†
- after 24 days of stable or decreasing daily minimum values

Clinical event associated with the PedVAE?:

- Ventilator associated Pneumonia
- Atelectasis
- Acute Respiratory Distress Syndrome (ARDS)
- Pulmonary Hypertension
- Pulmonary Edema
- Other (specify)

Antimicrobial agent(s) administered?:

- Drug 1: ___________________________ Y / Dru
- Drug 2: ___________________________ Y / Dru
- Drug 3: ___________________________ Y / Dru

Pathogen identified from one or more of the listed specimens?:

- Lower Respiratory
- Upper Respiratory
- Lung Tissue
- Pleural Fluid
- Urine for Legionella or Streptococcus pneumoniae antigen testing

Pathogen identified from BLOOD?:

- Y / Yes
- Upper Respiratory
- Lower Respiratory
- Lung Tissue
- Pleural Fluid
- Urine for Legionella or Streptococcus pneumoniae antigen testing

Pathogens:

- Pathogen 1: ___________________________ Y / Search
- Pathogen 2: ___________________________ Y / Search
- Pathogen 3: ___________________________ Y / Search

PedVAE contributed to death: N - No

Optional: Check Y if any pathogen was detected by culture or non-culture-based microbiological testing of upper or lower respiratory specimens and Legionella or Streptococcus pneumoniae detected by urine antigen testing on the date of event or within the 2 days before or 2 days after the event otherwise check N

Specify pathogens on reverse form.
| Event Details: Pathogen identified | Optional. Check Y if any pathogen was detected by culture or non-culture-based microbiological testing of upper or lower respiratory specimens and *Legionella* or *Streptococcus pneumoniae* detected by urine antigen testing on the date of event or within the 2 days before or 2 days after the event otherwise check N. Specify pathogens on reverse form. |
| Event Details: Source of Pathogen Identified | Optional. If pathogen identified = Y select all specimen sources that apply: Lower Respiratory (for example, sputum, tracheal aspirate, bronchial washing, bronchoalveolar lavage), Upper Respiratory (for example, nasopharyngeal wash or swab), Lung Tissue, Pleural Fluid, Urine for *Legionella* or *Streptococcus pneumoniae* antigen testing otherwise check N. |
| Event Details: Pathogen identified in Blood | Optional. Check Y if pathogen was identified from blood with a specimen collection date within 2 days before the event date to 13 days after the event date otherwise check N. Specify pathogens on reverse form. |
Denominator Data

- Patient Days (required)
- Ventilator Days (required)
- NICU denominator data (patient days and ventilator days)
  - NICU Birthweight (required)
    - ≤750 g
    - 751-1000 g
    - 1001-1500 g
    - 1501-2500 g
    - >2500 g
  - NICU Gestational Age (optional)
    - Extremely preterm (<28 weeks)
    - Very preterm (28 to <32 weeks)
    - Moderate to late preterm (32 to <37 weeks)
    - Term (≥37 weeks)
- Episodes of Mechanical Ventilation (optional)
# Monthly Reporting Plan – Pediatric Location

## Add Monthly Reporting Plan

Mandatory fields marked with ★

- **Facility ID ★:** DHQP Memorial Hospital (ID 10000)
- **Month ★:** January
- **Year ★:** 2019

- □ No NHSN Patient Safety Modules Followed this Month

### Device-Associated Module

<table>
<thead>
<tr>
<th>Locations</th>
<th>CLABSI</th>
<th>VAE</th>
<th>CAUTI</th>
<th>CLIP</th>
<th>PedVAP</th>
<th>PedVAE</th>
</tr>
</thead>
<tbody>
<tr>
<td>MICU-2 - MEDICAL ICU</td>
<td>✔️</td>
<td></td>
<td>✔️</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0910 - ADULT REHAB</td>
<td>✔️</td>
<td></td>
<td>✔️</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NICU 3 - LEVEL 3 NICU</td>
<td>✔️</td>
<td></td>
<td>✔️</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PICU2 - PEDIATRIC ICU</td>
<td>✔️</td>
<td></td>
<td>✔️</td>
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<td>✔️</td>
<td>✔️</td>
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<tr>
<td>CMICU_N - CARDIAC ICU</td>
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<td>✔️</td>
<td>✔️</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GRANT 4 - CARDIAC MED SURG WARD</td>
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<td>✔️</td>
<td>✔️</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 SOUTH - IRF</td>
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<td>✔️</td>
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<tr>
<td>CC_ONC - CRITICAL CARE ONC</td>
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<td>✔️</td>
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<td>□</td>
<td></td>
<td>□</td>
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</tbody>
</table>
Summary Data - Pediatric Location

**Denominator Data**

<table>
<thead>
<tr>
<th>Denominator Data</th>
<th>Report No Events</th>
<th>Check Box(es) if Sampling Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Patient Days</td>
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<tr>
<td>Central Line Days</td>
<td>CLABSI:</td>
<td></td>
</tr>
<tr>
<td>Urinary Catheter Days</td>
<td>CAUTI:</td>
<td></td>
</tr>
<tr>
<td>Ventilator Days</td>
<td>VAE:</td>
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<tr>
<td></td>
<td>PedVAE:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PedVAP:</td>
<td></td>
</tr>
<tr>
<td>APRV Days</td>
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<td></td>
</tr>
<tr>
<td>Episodes of Mechanical Ventilation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Mandatory fields marked with *
### Monthly Reporting Plan – NICU Location

**Add Monthly Reporting Plan**

Mandatory fields marked with *

- **Facility ID**: DHQP Memorial Hospital (ID 10000)
  - **Month**: January
  - **Year**: 2019
- **No NHSN Patient Safety Modules Followed this Month**

#### Device-Associated Module

<table>
<thead>
<tr>
<th>Locations</th>
<th>CLABSI</th>
<th>VAE</th>
<th>CAUTI</th>
<th>CLIP</th>
<th>PedVAP</th>
<th>PedVAE</th>
</tr>
</thead>
<tbody>
<tr>
<td>MICU-2 - MEDICAL ICU</td>
<td>✔</td>
<td></td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0910 - ADULT REHAB</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NICU 3 - LEVEL 3 NICU</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>PICU2 - PEDIATRIC ICU</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>CMICU_N - CARDIAC ICU</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GRANT 4 - CARDIAC MED SURG WARD</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 SOUTH - IRF</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CC_ONC - CRITICAL CARE ONC</td>
<td>✔</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NICU - NICU</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>✔</td>
</tr>
</tbody>
</table>
Summary Data - NICU Location

Neonatal Intensive Care Unit

Mandatory fields marked with *

- Facility ID: [Hospital Name (ID: 12345)]
- Location Code: NICU
- Month: January
- Year: 2023

Birth Weights

<table>
<thead>
<tr>
<th>Birth Weight</th>
<th>Patient Days</th>
<th>CI Days</th>
<th>No CLABSI</th>
<th>Vent Days</th>
<th>No PedVAP</th>
<th>No PedVAP</th>
<th>EMV</th>
<th>BrC Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;=750</td>
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<td></td>
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<tr>
<td>751-1000</td>
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<tr>
<td>1001-1500</td>
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</tr>
<tr>
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</table>

Gestational Ages

<table>
<thead>
<tr>
<th>Gestational Age</th>
<th>Patient Days</th>
<th>Vent Days</th>
<th>No PedVAP</th>
<th>EMV</th>
</tr>
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<tbody>
<tr>
<td>Extremely preterm (&lt;28 weeks)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Very preterm (28 to &lt;32 weeks)</td>
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</tr>
<tr>
<td>Moderate to late preterm (32 to &lt;37 weeks)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Term (&gt;=37 weeks)</td>
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</tbody>
</table>
# Summary Data - NICU Location

### Neonatal Intensive Care Unit

Mandatory fields marked with ★

- **Facility ID**: DHQP Memorial Hospital (ID 10000)
- **Location Code**: NICU - NICU
- **Month**: January
- **Year**: 2019

## Birth Weights

<table>
<thead>
<tr>
<th>Birth Weight</th>
<th>Patient Days</th>
<th>CL Days</th>
<th>No CLABSI</th>
<th>Vent Days</th>
<th>No PedVAE</th>
<th>PedVAP</th>
<th>EMV</th>
<th>UrC Days</th>
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<td>&lt;=750</td>
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<td>&gt;2500</td>
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</tr>
</tbody>
</table>

## Gestational Ages

### Gestational Age

- **Extremely preterm (<28 weeks)**
- **Very preterm (28 to <32 weeks)**
- **Moderate to late preterm (32 to <37 weeks)**
- **Term (≥37 weeks)**

<table>
<thead>
<tr>
<th>Gestational Age</th>
<th>Patient Days</th>
<th>Vent Days</th>
<th>No PedVAE</th>
<th>EMV</th>
</tr>
</thead>
<tbody>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Term (≥37 weeks)</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
PedVAE Calculator
PedVAE Calculator

Surveillance for Pediatric Ventilator-associated Events

PedVAE surveillance is available in-plan for pediatric and neonatal inpatient locations only. PedVAP surveillance using the PNEU protocol continues to be available for in-plan surveillance for pediatric locations only.

The Pediatric Ventilator-Associated Event Calculator (must have javascript enabled) operates based upon the currently posted PedVAE protocol.

Resources for NHSN Users Already Enrolled

- Training
- Protocols
- Frequently Asked Questions
- Data Collection Forms
- Supporting Materials
- **Calculator**

**Pediatric Ventilator-Associated Event Calculator** (javascript must be enabled)

- Analysis Resources
Pediatric Ventilator–Associated Event Calculator

Version 1.0

Welcome to Version 1.0 of the PedVAE Calculator. Version 1.0 operates based upon the currently posted PedVAE protocol.

The Calculator is a web-based tool that is designed to help you learn how the PedVAE surveillance definition algorithm works and assist you in making PedVAE determinations.

Please note that the PedVAE Calculator will not ask you to enter any patient identifiers (other than dates of mechanical ventilation, which you can change as you see fit). The PedVAE Calculator does not store any patient data that you enter, and it will not report any data that you enter or any PedVAE determinations to the NHSN. You will not be able to export data entered into the Calculator.

If you have questions or suggestions about the Calculator, please feel free to send them to the NHSN mailbox, nhsn@cdc.gov.

https://www.cdc.gov/nhsn/pedvaec-calculator/index.html
Welcome to the Pediatric Ventilator-Associated Event Calculator. Version 1.0 operates based upon the currently posted PedVAE protocol. It is strongly encouraged that you thoroughly review the PedVAE protocol.

- The calculator recognizes Mean Airway Pressure (MAP) values 0-8 cmH2O as equal to 8 for patients < 30 days of age and MAP values 0-10 cmH2O as equal to 10 for patients ≥ 30 days of age and corrects entries according to the PedVAE protocol prior to making a PedVAE determination.
- Daily minimum MAP readings are to be rounded to the nearest whole number using the following method as an example: A MAP value 10.00 - 10.49 is rounded to 10 and a MAP value 10.50 - 10.99 is rounded to 11.
- The calculator finds multiple PedVAEs per patient as long as they conform to the 14 day rule.

To get started, enter a date below that corresponds to the first day the patient was placed on mechanical ventilation during the mechanical ventilation episode of interest. You may type in a date or use the popup calendar when it appears. You may only enter dates within the past year. If the patient has been on mechanical ventilation for more than one year during the current mechanical ventilation episode, choose a start date that is more recent but is at least 7 days before the period of interest. more...
Welcome to the Pediatric Ventilator-Associated Event (PedVAE) Calculator Version 1.0. Version 1.0 operates based upon the currently posted PedVAE protocol. It is strongly encouraged that you thoroughly review the PedVAE protocol.

- The calculator recognizes Mean Airway Pressure (MAP) values 0-8 cmH₂O as equal to 8 for patients < 30 days of age and MAP values 0-10 cmH₂O as equal to 10 for patients ≥ 30 days of age and corrects entries according to the PedVAE protocol prior to making a PedVAE determination.
- Daily minimum MAP readings are to be rounded to the nearest whole number using the following method as an example: A MAP value 10.00 - 10.49 is rounded to 10 and a MAP value 10.50 - 10.99 is rounded to 11.
- The calculator finds multiple PedVAEs per patient as long as they conform to the 14 day rule.

To get started, enter a date below that corresponds to the first day the patient was placed on mechanical ventilation during the mechanical ventilation episode of interest. You may type in a date or use the popup calendar when it appears. You may only enter dates within the past year. If the patient has been on mechanical ventilation for more than one year during the current mechanical ventilation episode, choose a start date that is more recent but is at least 7 days before the period of interest.

The calculator runs locally on your machine. Data that you enter are not stored, nor are they transmitted to NHSN. Feel free to enter or change as much data as you like. If you don’t understand something, there are several mechanisms for getting help. Most of the buttons and table headings will give an expanded description if you hover your mouse over the item in question. Also, the explain button will pop up an explanation of the reasoning behind the calculation. The explanation box is movable as are all the popup windows. That allows you to open one up and drag it to the side as you work. The explanation will automatically update itself as you work through the protocol.
Welcome to the Pediatric Ventilator-Associated Event Calculator. Version 1.0 operates based upon the currently posted PedVAE protocol. It is strongly encouraged that you thoroughly review the PedVAE protocol.

- The calculator recognizes Mean Airway Pressure (MAP) values 0-8 cmH\(_2\)O to count as 0 days of age and corrects entries according to the PedVAE protocol prior to calculating the days of ventilator associated event (VAE). Daily minimum MAP readings are to be rounded to the nearest whole number below 10.00; for example, a MAP value 10.50 - 10.99 is rounded to 11.
- The calculator finds multiple PedVAEs per patient as long as they conform to the mechanical ventilation episode of interest. You may type in a date or use the popup calendar when it appears. You may only enter dates within a mechanical ventilation episode, choose a start date that is more recent but is at least 30 days from the day prior to the end date. A MAP value 10.00 - 10.49 is rounded to 10 and a MAP value ≥ 10.50 is rounded to 11. A MAP value 10 cmH\(_2\)O or less is rounded to 0.

To get started, enter a date below that corresponds to the first day the patient was on mechanical ventilation for more than one year during the current mechanical ventilation episode of interest.
**NHSN Pediatric Ventilator-Associated Event (PedVAE) Calculator Ver. 1.0**

Now enter MAP and/or FiO\(_2\) values and when done, click the ‘Calculate PedVAE’ button. *You do not need to enter data for every day.* Concentrate on the dates where you believe a PedVAE may be likely. If your values meet the PedVAE definition, the event day will be identified.

**Is the patient’s age less than 30 days?:**

- [ ] Yes
- [x] No

**Legend:**

- ↑ PedVAE
- ↑ PedVAE Date

<table>
<thead>
<tr>
<th>MV Day</th>
<th>Date</th>
<th>Min. MAP (cmH(_2)O)</th>
<th>Min. FiO(_2) (21 - 100)</th>
<th>PedVAE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>12/30/2018</td>
<td>3</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>12/31/2018</td>
<td>8</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1/1/2019</td>
<td>12</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>1/2/2019</td>
<td>12</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>1/3/2019</td>
<td>12</td>
<td>40</td>
<td></td>
</tr>
</tbody>
</table>
Patient < 30 days
• MAP values 0-8 = 8
• PedVAE identified
NHSN Pediatric Ventilator-Associated Event (PedVAE) Calculator Ver. 1.0

No Pediatric Ventilator-Associated Event (PedVAE) detected. Click on the "Explain" button to see an explanation of the PedVAE definition.

<table>
<thead>
<tr>
<th>MV Day</th>
<th>Date</th>
<th>Min. MAP 0-50 cmH2O</th>
<th>Min. Fio2 21-100</th>
<th>PedVAE</th>
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<tbody>
<tr>
<td>1</td>
<td>12/30/2018</td>
<td>10 (3)*</td>
<td>30</td>
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<td>3</td>
<td>1/1/2019</td>
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<td>4</td>
<td>1/2/2019</td>
<td>12</td>
<td>40</td>
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</tr>
<tr>
<td>5</td>
<td>1/3/2019</td>
<td>12</td>
<td>40</td>
<td></td>
</tr>
</tbody>
</table>

Legend: † - PedVAE ‡ - PedVAE Date

• Patient ≥ 30 days
• MAP values 0-10 = 10
• No PedVAE
• Increase over baseline is not ≥ 4 cmH20
• **Warning Box**
• To address change in age $\geq 30$ during period of interest
• Update to PedVAE Calculator Version 1.0 to follow
### Warning

The calculator's PedVAE determination may be affected when the patient crosses the 30-day threshold during the period of interest (2 day baseline period and 2 day period of worsening oxygenation).

### Additional fields
- Is Patient < 30 Days on date of MV initiation
- What is Day of Life on date of MV initiation

<table>
<thead>
<tr>
<th>MV Day</th>
<th>Date</th>
<th>Min. MAP 0 – 50 (cmH2O)</th>
<th>Min. fO2 (21 - 100)</th>
<th>PedVAE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>12/30/2018</td>
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<td>30</td>
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<tr>
<td>2</td>
<td>12/31/2018</td>
<td>10(8)</td>
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<tr>
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<td>12</td>
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<tr>
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</table>
The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.