Patient Safety Component: Pediatric Ventilator-associated Event (PedVAE) Surveillance

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March 2024

Learning Objectives

At the conclusion of this presentation, participants will be able to:

- Explain Pediatric Ventilator-associated Events (PedVAE) key terms
- Determine Daily Minimum Values
- Apply the PedVAE surveillance algorithm
- Locate resources for PedVAE surveillance and reporting, including the PedVAE Calculator

PedVAE Surveillance - History

Ventilated Patients: Risks

- Ventilated patients are at high risk for complications and poor outcomes
- Ventilator associated complications can lead to
  - longer duration of mechanical ventilation
  - longer stays in the intensive care unit (ICU) and hospital
  - increased healthcare costs
  - increased risk of morbidity and mortality

Neonatal Ventilated Patients: Risks

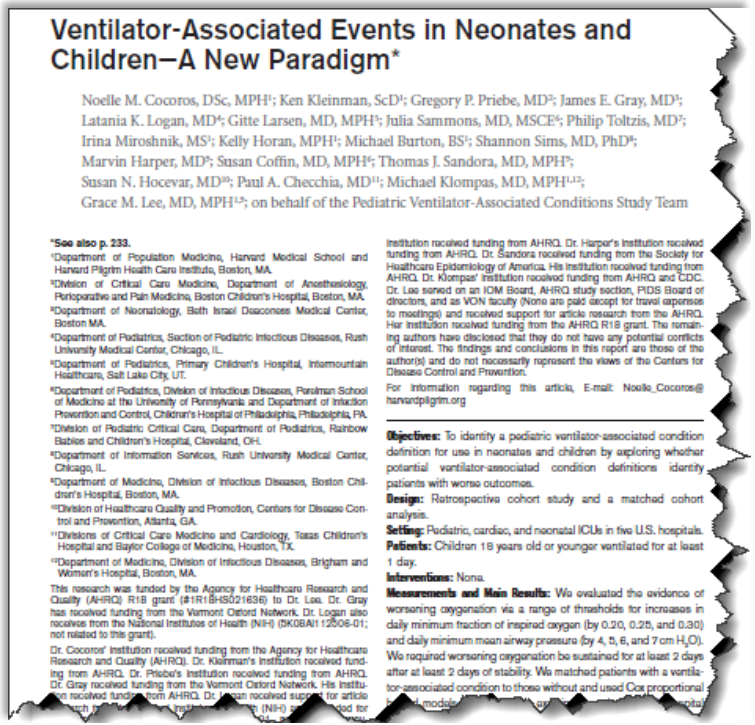
- In preterm neonates, prolonged mechanical ventilation for respiratory distress syndrome can contribute to the development of chronic lung disease
- Prolonged mechanical ventilation in extremely low birthweight infants is also associated with neurodevelopmental delay

PedVAE Surveillance: Development

- **Pediatric and Neonatal VAE Surveillance Working Group** convened in 2012 to explore use of the adult Ventilator-Associated Event (VAE) algorithm in pediatric and neonatal inpatient locations
  - Insufficient data available to inform development of a pediatric VAE definition

PedVAE Surveillance: Evidence Base

- 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



Ventilator-Associated Events in Neonates and Children—A New Paradigm*

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*See also p. 233.

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This research was funded by the Agency for Healthcare Research and Quality (AHRQ) R18 grant (#1R18HS021636) to Dr. Lee. Dr. Gray has received funding from the Vermont Oxford Network. Dr. Logan also receives from the National Institutes of Health (NIH) (5K08AI112506-01; not related to this grant).

Dr. Cocoros' institution received funding from the Agency for Healthcare Research and Quality (AHRQ). Dr. Kleinman's institution received funding from AHRQ. Dr. Priebe's institution received funding from AHRQ. Dr. Gray received funding from the Vermont Oxford Network. His institution received funding from AHRQ. Dr. Logan received support for article research from the NIH. Her institution received funding from AHRQ. Dr. Harper's institution received funding from AHRQ. Dr. Sandora received funding from the Society for Healthcare Epidemiology of America. His institution received funding from AHRQ. Dr. Klompas' institution received funding from AHRQ and CDC. Dr. Lee served on an IOM Board, AHRQ study section, PIDS Board of directors, and as VON faculty (None are paid except for travel expenses to meetings) and received support for article research from the AHRQ. Her institution received funding from the AHRQ R18 grant. The remaining authors have disclosed that they do not have any potential conflicts of interest. The findings and conclusions in this report are those of the author(s) and do not necessarily represent the views of the Centers for Disease Control and Prevention.

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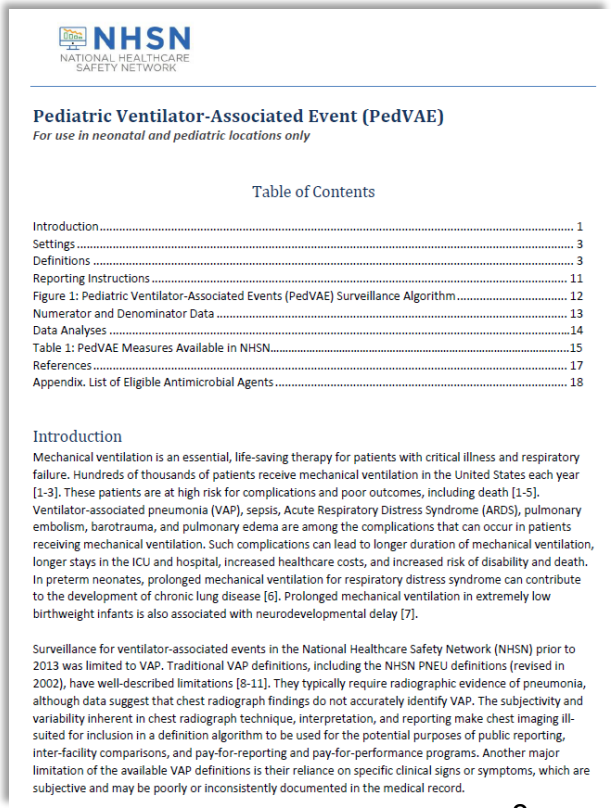
Objectives: To identify a pediatric ventilator-associated condition definition for use in neonates and children by exploring whether potential ventilator-associated condition definitions identify patients with worse outcomes.
Design: Retrospective cohort study and a matched cohort analysis.
Setting: Pediatric, cardiac, and neonatal ICUs in five U.S. hospitals.
Patients: Children 18 years old or younger ventilated for at least 1 day.
Interventions: None.
Measurements and Main Results: We evaluated the evidence of worsening oxygenation via a range of thresholds for increases in daily minimum fraction of inspired oxygen (by 0.20, 0.25, and 0.30) and daily minimum mean airway pressure (by 4, 5, 6, and 7 cm H_2O). We required worsening oxygenation be sustained for at least 2 days after at least 2 days of stability. We matched patients with a ventilator-associated condition to those without and used Cox proportional

*Cocoros NM, Kleinman K, Priebe GP, et al. Ventilator-Associated Events in Neonates and Children--A New Paradigm. Crit Care Med. 2016 Jan;44:14-22.

PedVAE Surveillance: Implementation

- Pediatric and Neonatal VAE Surveillance Working Group consensus reached to begin development of PedVAE, with plans to implement as an available event in NHSN
- PedVAE field testing conducted in 2017
- PedVAE made available as an NHSN surveillance event starting January 2019



NHSN
NATIONAL HEALTHCARE SAFETY NETWORK

Pediatric Ventilator-Associated Event (PedVAE)

For use in neonatal and pediatric locations only

Table of Contents

Introduction

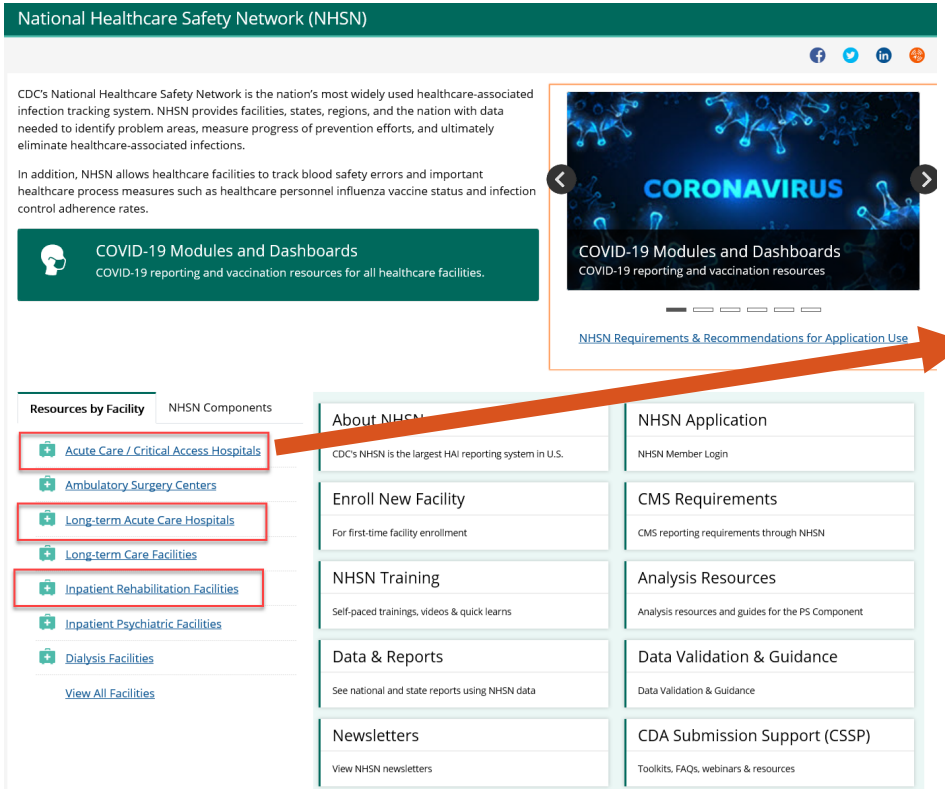
Mechanical ventilation is an essential, life-saving therapy for patients with critical illness and respiratory failure. Hundreds of thousands of patients receive mechanical ventilation in the United States each year [1-3]. These patients are at high risk for complications and poor outcomes, including death [1-5]. Ventilator-associated pneumonia (VAP), sepsis, Acute Respiratory Distress Syndrome (ARDS), pulmonary embolism, barotrauma, and pulmonary edema are among the complications that can occur in patients receiving mechanical ventilation. 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 [6]. Prolonged mechanical ventilation in extremely low birthweight infants is also associated with neurodevelopmental delay [7].

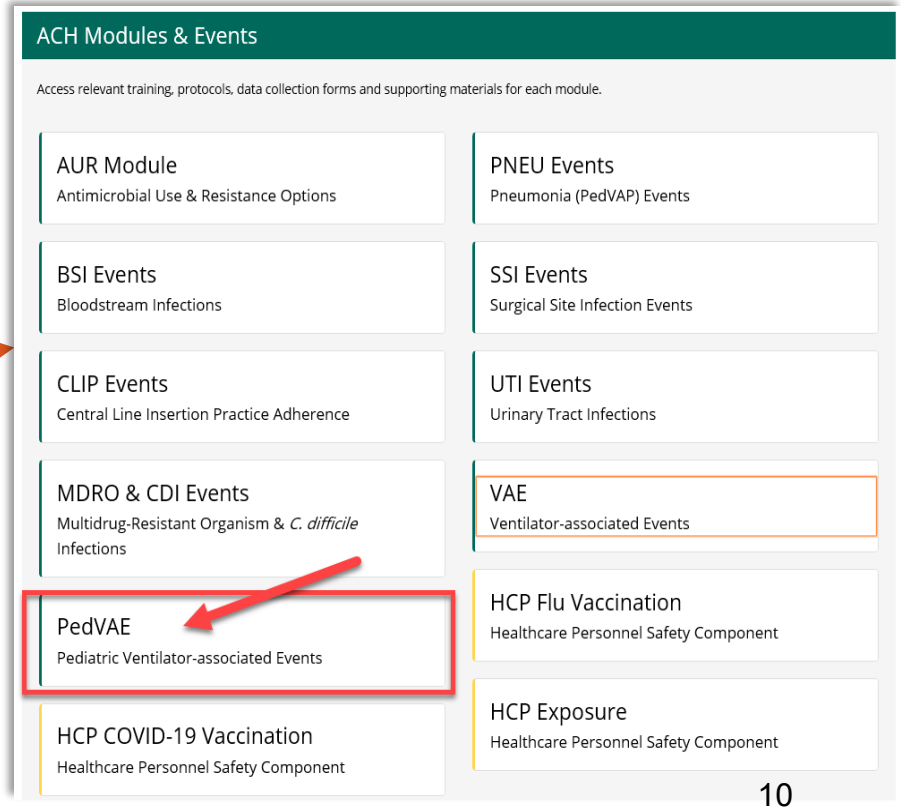
Surveillance for ventilator-associated events in the National Healthcare Safety Network (NHSN) prior to 2013 was limited to VAP. Traditional VAP definitions, including the NHSN PNEU definitions (revised in 2002), have well-described limitations [8-11]. They typically require radiographic evidence of pneumonia, although data suggest that chest radiograph findings do not accurately identify VAP. The subjectivity and variability inherent in chest radiograph technique, interpretation, and reporting make chest imaging ill-suited for inclusion in a definition algorithm to be used for the potential purposes of public reporting, inter-facility comparisons, and pay-for-reporting and pay-for-performance programs. Another major limitation of the available VAP definitions is their reliance on specific clinical signs or symptoms, which are subjective and may be poorly or inconsistently documented in the medical record.

PedVAE Surveillance - Resources

Accessing PedVAE Resources

NHSN webpage: https://www.cdc.gov/nhsn/index.html



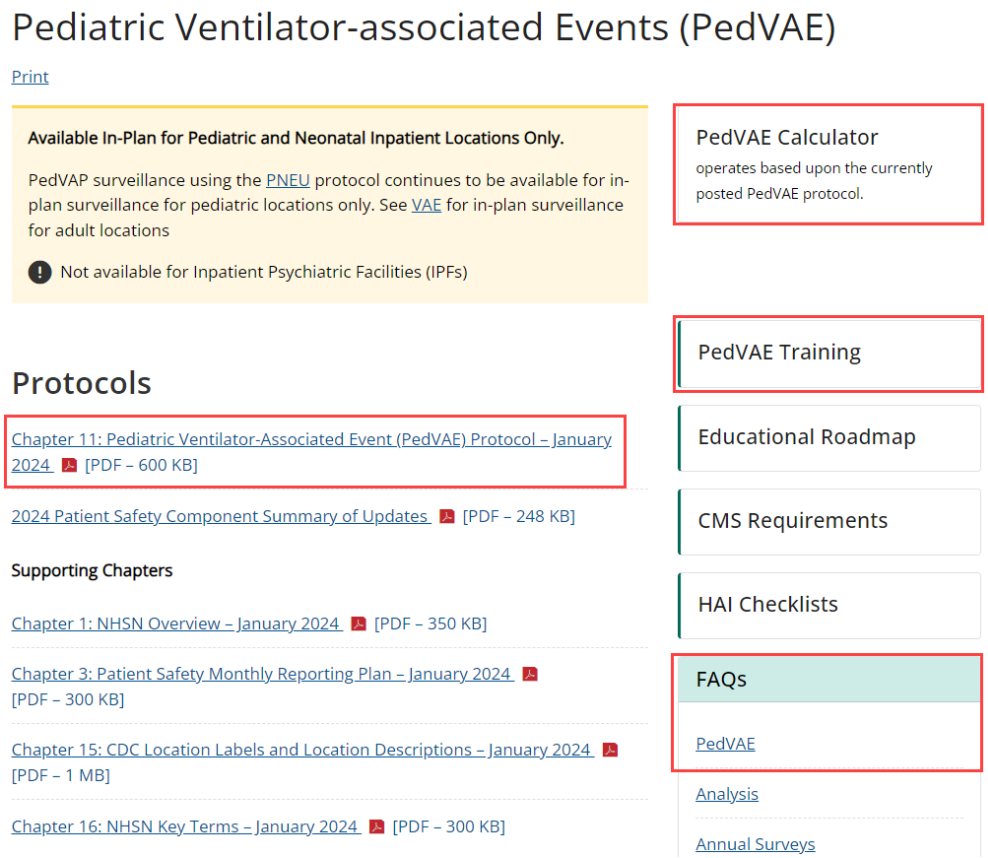


Available PedVAE Resources

PedVAE webpage:

https://www.cdc.gov/nhsn/psc/pedvae/index.html

- Protocol
- Calculator
- Training
- FAQs
- Forms
- And more!



PedVAE Surveillance – Inclusion Criteria

Ventilator Definition

- **Ventilator:** Any device used to support, assist, or control respiration (inclusive of the weaning period) through the application of positive pressure to the airway when delivered via an artificial airway, specifically an oral/nasal endotracheal or tracheostomy tube.
- **Note:** Ventilation and lung expansion devices that deliver positive pressure to the airway (for example, CPAP, BiPAP, Bi-level, IPPB, and PEEP) via non-invasive means (for example, nasal prongs, nasal mask, full face mask, total mask, etc.) are not considered ventilators unless positive pressure is delivered via an artificial airway (oral/nasal endotracheal or tracheostomy tube).

PedVAE Surveillance: Eligible Patients

- Ventilated inpatients in acute care hospitals, long term acute care hospitals, inpatient rehabilitation facilities
- Patients in **pediatric and neonatal locations** where denominator data (patient days and ventilator days) can be collected
  - Ventilated adults in pediatric locations are included in PedVAE surveillance – regardless of age

PedVAE Surveillance: Ineligible Patients

- 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
- Patients in non-acute care locations in acute care facilities (such as a chronic care unit)
- Pediatric patients in adult inpatient locations
  - Ventilated pediatric patients in adult locations are included in adult VAE surveillance

Other Inclusion Criteria

- INCLUDE patients on
  - High Frequency Oscillatory or Jet Ventilation
  - Airway Pressure Release Ventilation (APRV)
- INCLUDE patients who are receiving mechanical ventilation while also receiving
  - Prone positioning
  - Surfactant
  - Corticosteroids
  - Nitric oxide therapy
  - Helium-oxygen mixture (heliox)
  - Epoprostenol therapy

Knowledge Check #1

A mechanically ventilated pediatric patient was admitted to the adult ICU. Can PedVAE surveillance be performed for this patient?

A. Yes
B. No

Knowledge Check #1 - Rationale

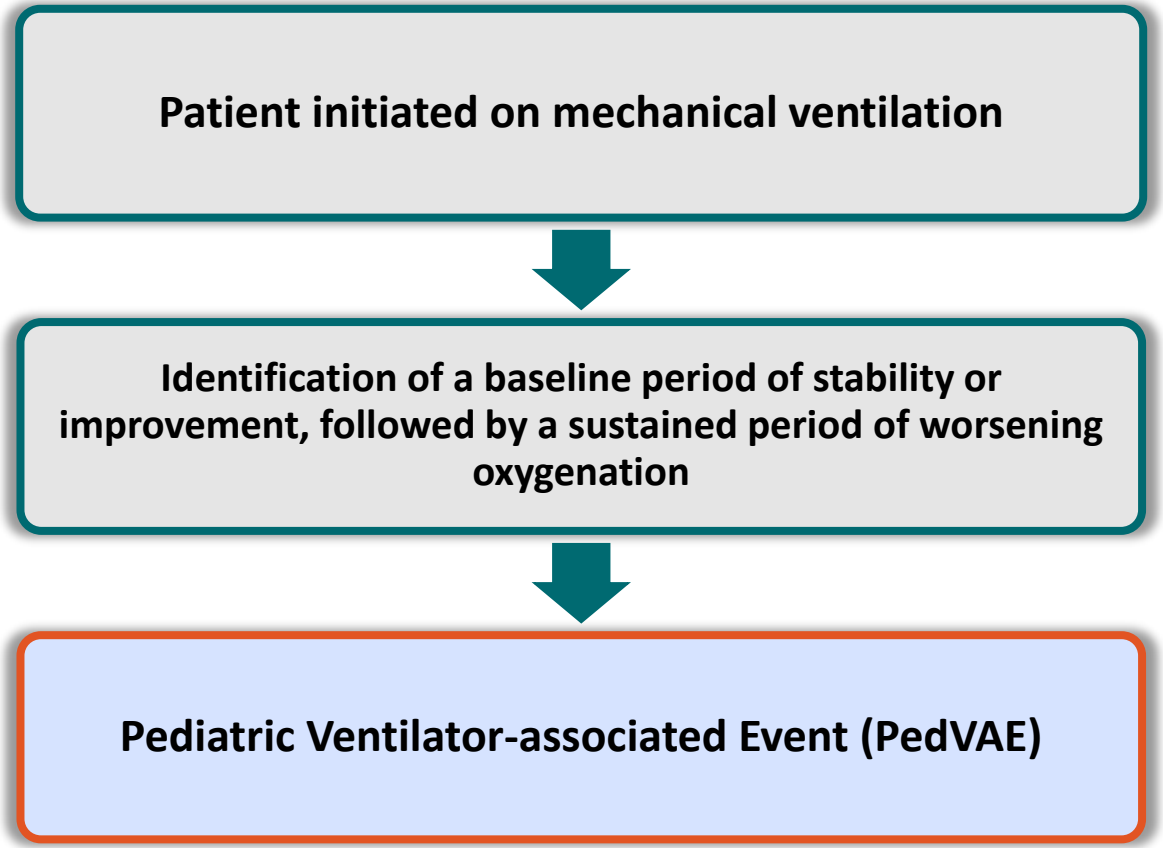
A mechanically ventilated pediatric patient was admitted to the adult ICU. Can PedVAE surveillance be performed for this patient?

No. PedVAE surveillance is location based, not age based. PedVAE surveillance can only be conducted in pediatric and neonatal inpatient locations.

PedVAE Definition – Overview

Reminder: 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



PedVAE Determination

- PedVAEs are determined by identification of deterioration in respiratory status after a period of stability or improvement on the ventilator
- Assessed by monitoring two key parameters that reflect oxygenation status in neonatal and pediatric ventilated patients:
  - Fraction of Inspired Oxygen - FiO_2
  - Mean Airway Pressure - MAP

FiO_2: Fraction of Inspired Oxygen

- Fraction of Oxygen in inspired gas
  - FiO_2 of room air is 0.21
  - Oxygen concentration of room air is 21%
- FiO_2 is a setting on the ventilator and is one of the key parameters that can be adjusted depending on the patient's oxygenation requirements
- FiO_2 values of 0.21, 21%, and 21 are used interchangeably

MAP: Mean Airway Pressure

- 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 - Positive End-Expiratory Pressure
  - PIP - Peak Inspiratory Pressure
  - Inspiratory time
  - Frequency

Knowledge Check #2

For the purposes of PedVAE surveillance, what does MAP mean?

A. Mean Arterial Pressure
B. Mean Airway Pressure

Knowledge Check #2 - Rationale

For the purposes of PedVAE surveillance, what does MAP mean?

Mean Airway Pressure

(For purposes of PedVAE surveillance, MAP is **NOT** Mean Arterial Pressure)

Daily Minimum Values

Daily Minimum Values

- FiO_2 ventilator settings and MAP values documented during the calendar day are used to identify the **daily minimum FiO_2** and **daily minimum MAP** values
- FiO_2 settings and MAP values 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
- Use a calendar day, not any other “24-hour capture period”

Daily Minimum Values Continued

- When determining the daily minimum values for FiO_2 and MAP, you will use all documented values that are recorded throughout the calendar day during times when the patient is receiving support from an eligible mode of mechanical ventilation
  - Include FiO_2 and MAP values documented during weaning/mechanical ventilation liberation trials as long as the patient is receiving ventilator support during those trials
  - Exclude FiO_2 and MAP values documented during periods of time when the patient is on extracorporeal life support or paracorporeal membrane oxygenation

Daily minimum FiO_2

- The daily minimum FiO_2 is defined as the **lowest documented FiO_2 setting that was maintained for > 1 hour during a calendar day**
- 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

Daily Minimum FiO_2 Continued

- The PedVAE protocol provides examples of how > 1 hour is to be determined to ensure standardization across all facilities
  - If documenting every 15 minutes, 5 consecutive recordings at the same setting are needed (for example, at 09:00, 09:15, 09:30, 09:45 and 10:00)
  - If documenting every 30 minutes, 3 consecutive recordings at the same setting are needed (for example, at 09:00, 09:30, and 10:00)
  - If documenting every hour, 2 consecutive recordings at the same setting are needed (for example, at 09:00 and 10:00)

Identify the Daily Minimum FiO_2 for Monday

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

	Monday 12am	3am	4am	6am	9am	12pm	3pm	9pm	11pm
FiO_2	0.80	0.70	0.90	0.80	0.80	0.75	0.75	0.75	0.75

- **Monday: 0.75** is the daily minimum FiO_2. The lowest value of 0.70 was not maintained for > 1 hour.

Identify the daily minimum FiO_2 for Monday and Tuesday

- Ventilation is initiated late in the calendar day on Monday

	Monday 2300	2330	Tuesday 0030	0100	0300	0600	0900	1200
FiO_2	0.70	0.80	0.80	O.80	0.80	0.75	0.75	0.80

- **Monday: 0.70** is the daily minimum FiO_2 - there was no value maintained for > 1 hour
  - Do not look to the next calendar day to determine if a setting was maintained > 1 hour
- **Tuesday: 0.75** is the daily minimum FiO_2 - the lowest value maintained for > 1 hour

Daily minimum MAP

- The daily minimum MAP is defined as 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. For example:
  - 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 continued

- For **patients < 30 days old** MAP values of 0-8 cmH_2O are considered **equal to 8 cmH_2O**
  - Any day where daily minimum MAP is 0-8 cmH_20 will be assigned a daily minimum MAP value of **8 cmH_20**.
- For **patients ≥ 30 days old** MAP values 0-10 cmH_2O are considered **equal to 10 cmH_2O**
  - Any day where daily minimum MAP is 0-10 cmH_20 will be assigned a daily minimum MAP value of **10 cmH_20**.

Identify the Daily Minimum MAP for a Patient < 30 Days old

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

	Monday 12 am	3am	6am	9am	12pm	3pm	6pm	9pm
MAP	8	6	8	5 (8)	5	8	10	10

- **Monday:** Daily minimum MAP is **8 cmH_2O**
- **Explanation:** The lowest documented value is 5 cmH_2O; however, for **patients < 30 days old, MAP values 0-8 = 8**.

Identify the Daily Minimum MAP for a Patient ≥ 30 Days Old

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

	Monday 12 am	3am	6am	9am	12pm	3pm	6pm	9pm
MAP	8	6	8	5(10)	5	8	10	10

- **Monday:** Daily minimum MAP is **10 cmH_2O**
- **Explanation:** The lowest documented value is 5 cmH_2O; however, for **patients ≥ 30 days old, MAP values 0-10 = 10**.

Identify the Daily Minimum MAP

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

	Monday 12 am	3am	6am	9am	12pm	3pm	6pm	9pm
MAP	12.4	11.7	12.9	12.2	12.8	11.9	12.7	13.2
	12	12	13	12	13	12	13	13

- **Monday:** Daily minimum MAP is **12 cmH_2O**
- **Explanation:** Remember to round MAP values as follows:
  - MAP decimals of .00 - .49 are rounded down to the nearest whole number
  - MAP decimals of .50 - .99 are rounded up to the nearest whole number

Knowledge Check #3

Daily minimum MAP is defined as the lowest MAP value documented during the calendar day, regardless of how long the value is maintained.

A. True

B. False

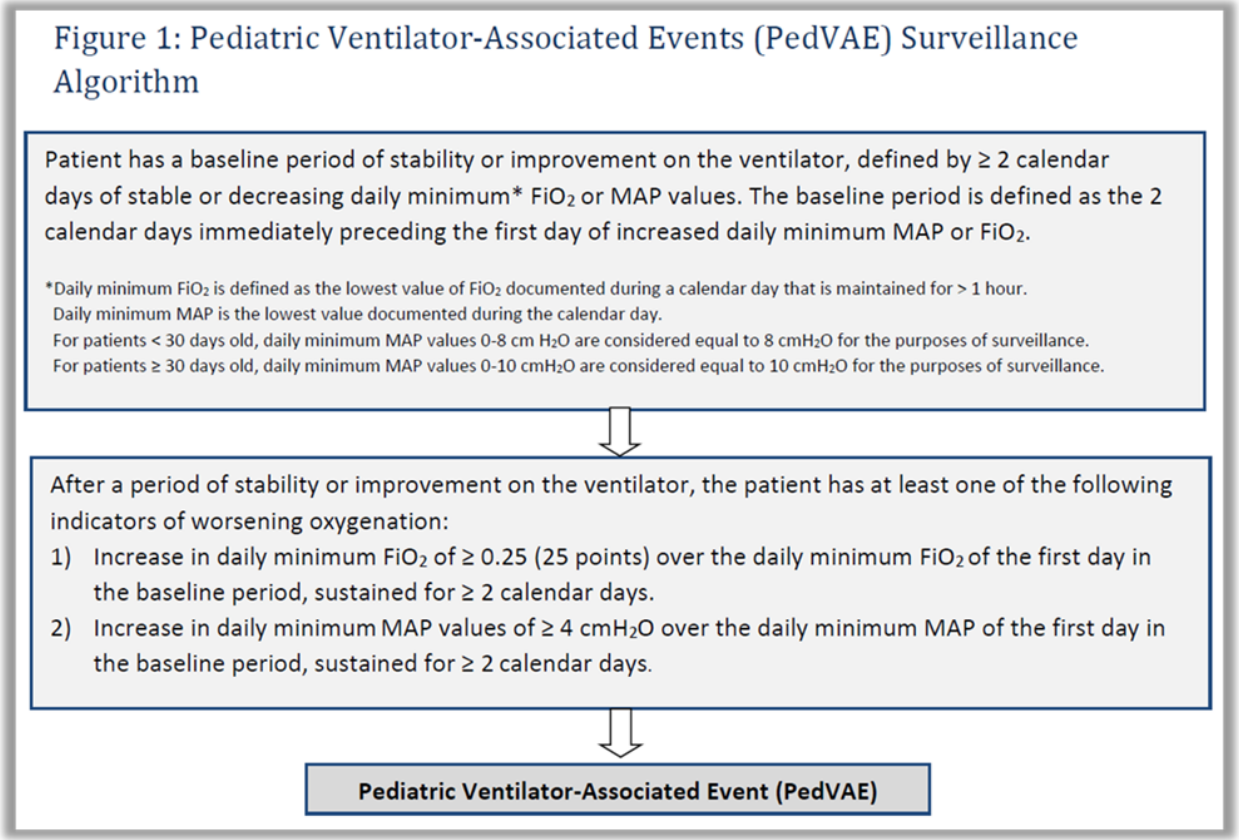
Knowledge Check #3 - Rationale

- Daily minimum MAP is the lowest MAP value documented during the calendar day, regardless of how long the value is maintained.
- When determining the daily minimum MAP, keep the following in mind:
  - MAP values documented to the decimal place are rounded to the nearest whole number
  - For patients < 30 days old, MAP values of 0-8 cmH_2O are assigned a MAP value of 8
  - For patients ≥ 30 days old, MAP values of 0-10 cmH_2O are assigned a MAP value of 10

Applying the PedVAE Algorithm

PedVAE Surveillance Algorithm

The PedVAE Surveillance Algorithm is located on p. 11-8 in the PedVAE protocol (https://www.cdc.gov/nhsn/pdfs/pscmanual/pedvae-current-508.pdf)



Meeting the PedVAE Definition

- Patients must be mechanically ventilated for some portion of the day for at least 4 consecutive calendar days to fulfill PedVAE criteria (where the day of intubation or initiation of mechanical ventilation is day 1)
  - At least **2 days** of stability or improvement
  - At least **2 days** of evidence of worsening oxygenation

Daily Minimum Values: Application

- The daily minimum FiO_2 and daily minimum MAP values are used to determine both the period of stability or improvement and the period that indicates worsening oxygenation
- Stability or improvement and worsening are not identified by comparing FiO_2 settings and MAP values that occur during a calendar day but by comparing the daily minimum values from calendar day to calendar day

Parameters: Assessment

- The period of stability or improvement and the evidence of worsening oxygenation must occur in the same parameter
- Each parameter is assessed independently of the other – PedVAE may be met only in the FiO_2 parameter, only in the MAP parameter, or in both parameters

Period of Stability or Improvement

- **Period of Stability or Improvement:** ≥ 2 calendar days of **stable or decreasing** daily minimum FiO_2 or MAP values

Stability:

Vent day	FiO2
1	40
2	40
3	40

Improvement:

Vent day	FiO2
1	50
2	40
3	30

- **Baseline Period:** the **2 calendar days** immediately preceding the first day of evidence of worsening oxygenation

Evidence of Worsening Oxygenation

- **Evidence of Worsening Oxygenation:** 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 FiO_2 of **≥ 0.25 (25 points)** over the daily minimum FiO_2 of the first day in the baseline period, sustained for ≥ 2 calendar days.

    OR

    - Increase in daily minimum MAP values of **≥ 4 cmH_2O** over the daily minimum MAP of the first day in the baseline period, sustained for ≥ 2 calendar days.

Knowledge Check #4

PedVAE can be met with a baseline period of stability or improvement in the FiO_2 parameter and a period of worsening oxygenation in the MAP parameter.

A. True

B. False ✓

Knowledge Check #4 - Rationale

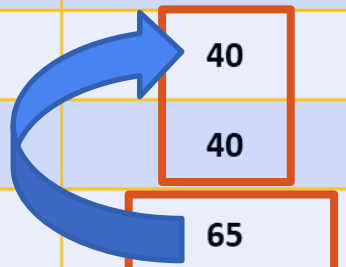
- When meeting the PedVAE definition the baseline period of stability or improvement and the period of worsening oxygenation must occur in the same parameter.
- The FiO_2 parameter and the MAP parameter are assessed independently of the other.
- PedVAE can be met in only the FiO_2 parameter, or in only the MAP parameter, or in both parameters.

PedVAE Determination: FiO_2 Parameter

A baseline period of stability or improvement in the **FiO_2 parameter** is immediately followed by an increase in the daily minimum FiO_2 of **≥ 0.25 (25 points)** over the daily minimum FiO_2 of the first day in the baseline period that is sustained for ≥ 2 calendar days

Operationalizing PedVAE FiO_2: Example 1

Vent Day	Daily Minimum MAP	Daily Minimum FiO_2
1	13	60
2	10	40
3	10	40
4	12	65
5	12	70
6	10	70
7	8	60
8	8	60

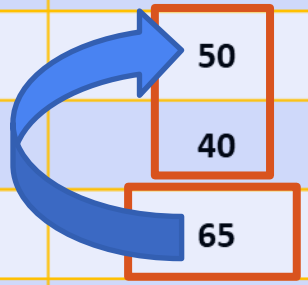


PedVAE met

- Baseline period of stability
- Increase of ≥ 0.25 (25 points) over the first day of the baseline period
- Sustained for ≥ 2 calendar days

Operationalizing PedVAE FiO_2: Example 2

Vent Day	Daily Minimum MAP	Daily Minimum FiO_2
1	13	60
2	10	50
3	10	40
4	12	65
5	12	70
6	10	70
7	8	60
8	8	60

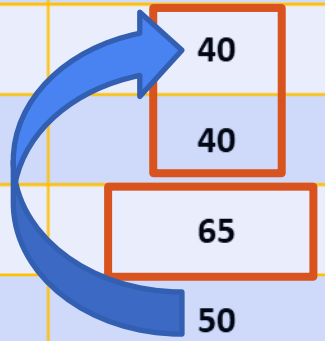


No PedVAE

- Baseline period of improvement
- ≥ 0.25 (25 points) increase is <u>not</u> over the <u>first day</u> in the baseline period

Operationalizing PedVAE FiO_2: Example 3

Vent Day	Daily Minimum MAP	Daily Minimum FiO_2
1	13	60
2	10	40
3	10	40
4	12	65
5	12	50
6	10	40
7	8	40
8	8	40



No PedVAE

- Baseline period of stability
- ≥ 0.25 (25 points) increase over the baseline period is not sustained for ≥ 2 days

PedVAE Determination: MAP Parameter

A baseline period of stability or improvement in the **MAP parameter** is immediately followed by an increase in the daily minimum MAP of **≥ 4 cmH_2O** over the daily minimum MAP of the first day in the baseline period that is sustained for ≥ 2 calendar days

Operationalizing PedVAE MAP: Example 1

*patient < 30 days old – MAP values 0-8 = 8

Vent Day	Daily Minimum MAP	Daily Minimum FiO_2
1	13	60
2	8 (7)*	
3	8 (7)*	
4	12	
5	12	
6	10	
7	8	40
8	8	40

≥ 2-day period of stability in MAP parameter

≥ 2-day period of worsening in MAP parameter with an increase of ≥ 4 cm H_2O over the first day of the baseline period

PedVAE met

Operationalizing PedVAE MAP: Example 2

*patient ≥ 30 days old – MAP values 0-10 = 10

Vent Day	Daily Minimum MAP	Daily Minimum FiO_2
1	13	60
2	10 (7)*	
3	10 (7)*	
4	12	
5	12	
6	10	40
7	8	40
8	8	40

No PedVAE

≥ 2-day period of stability in MAP parameter

Increase in MAP parameter does not meet the requirement of ≥ 4 cm H_2O over the first day of the baseline period

Operationalizing PedVAE MAP: Example 3

*patient ≥ 30 days old – MAP values 0-10 = 10

Vent Day	Daily Minimum MAP	Daily Minimum FiO_2
1	13	60
2	10 (7)*	
3	10 (7)*	
4	14	
5	14	
6	10	
7	8	40
8	8	40

≥ 2-day period of stability in MAP parameter

≥ 2-day period of worsening in MAP parameter with an increase of ≥ 4 cm H_2O over the first day of the baseline period

PedVAE met

Date of Event

- The date of onset of worsening oxygenation (day 1 of the required ≥ 2-day period of worsening oxygenation following a ≥ 2-day period of stability or improvement on the ventilator)
  - Earliest date of event for PedVAE is mechanical ventilation day 3 (first day of worsening oxygenation)
  - The first two days of mechanical ventilation can establish the baseline period

14-Day Event Period

- PedVAEs are defined by a 14-day period
- The Date of Event is day 1 of the 14-day Event Period
  - A new PedVAE cannot be reported until the 14-day period has elapsed
  - For example, if a PedVAE is reported with a date of event March 1, this sets a 14-day event period March 1 - 14, and the earliest date a new PedVAE can be detected and reported is March 15
  - The 2 days of stability or improvement for a new PedVAE can occur during the previous 14-day event period

Date of Event: Determination
(patient < 30 days old)

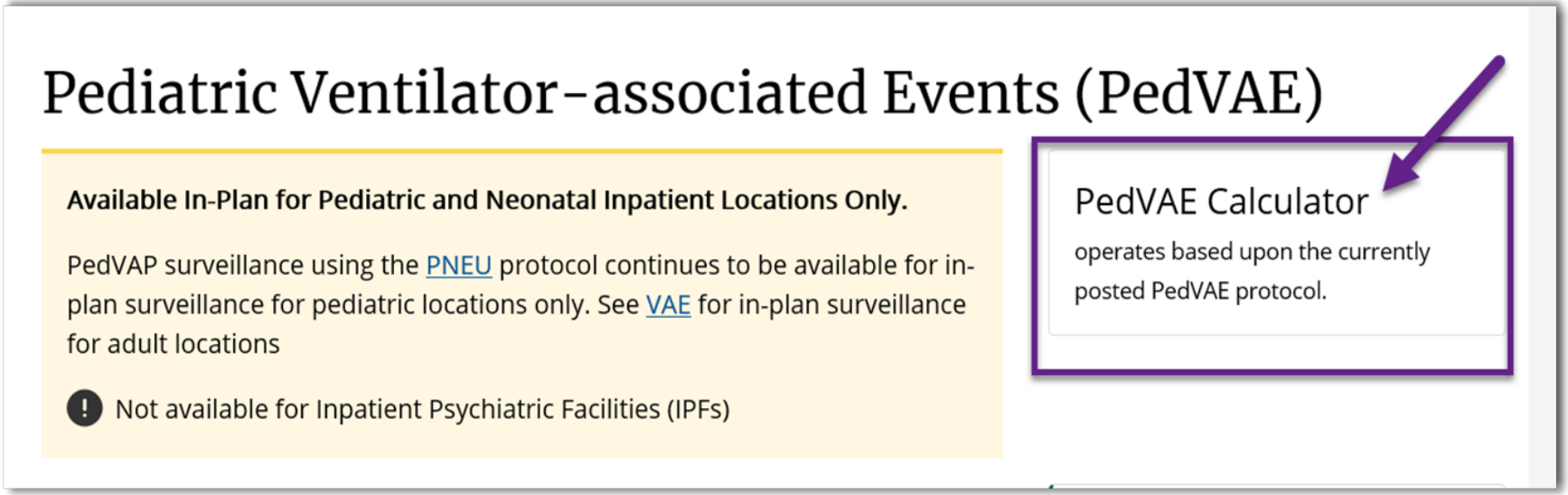
Vent Day	MAPmin	FiO_2 min
1	13	60
2	8 (7)	40
3	8 (7)	40
4	12	65
5	12	50
6	10	40
7	8	40
8	8	40

- Date of event = Mechanical Vent (MV) day 4 (first day of worsening oxygenation)
- 14-day event period = MV day 4 – MV day 17

PedVAE Calculator

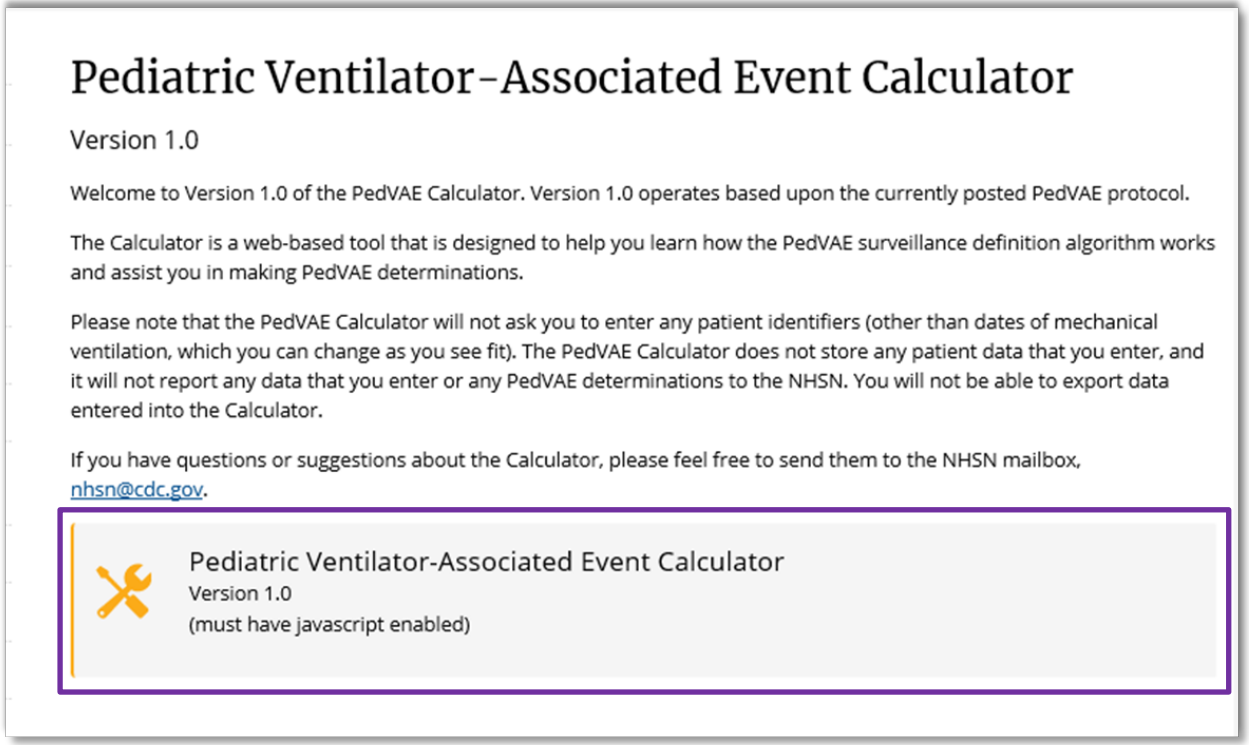
PedVAE Calculator Access

https://www.cdc.gov/nhsn/psc/pedvae/index.html

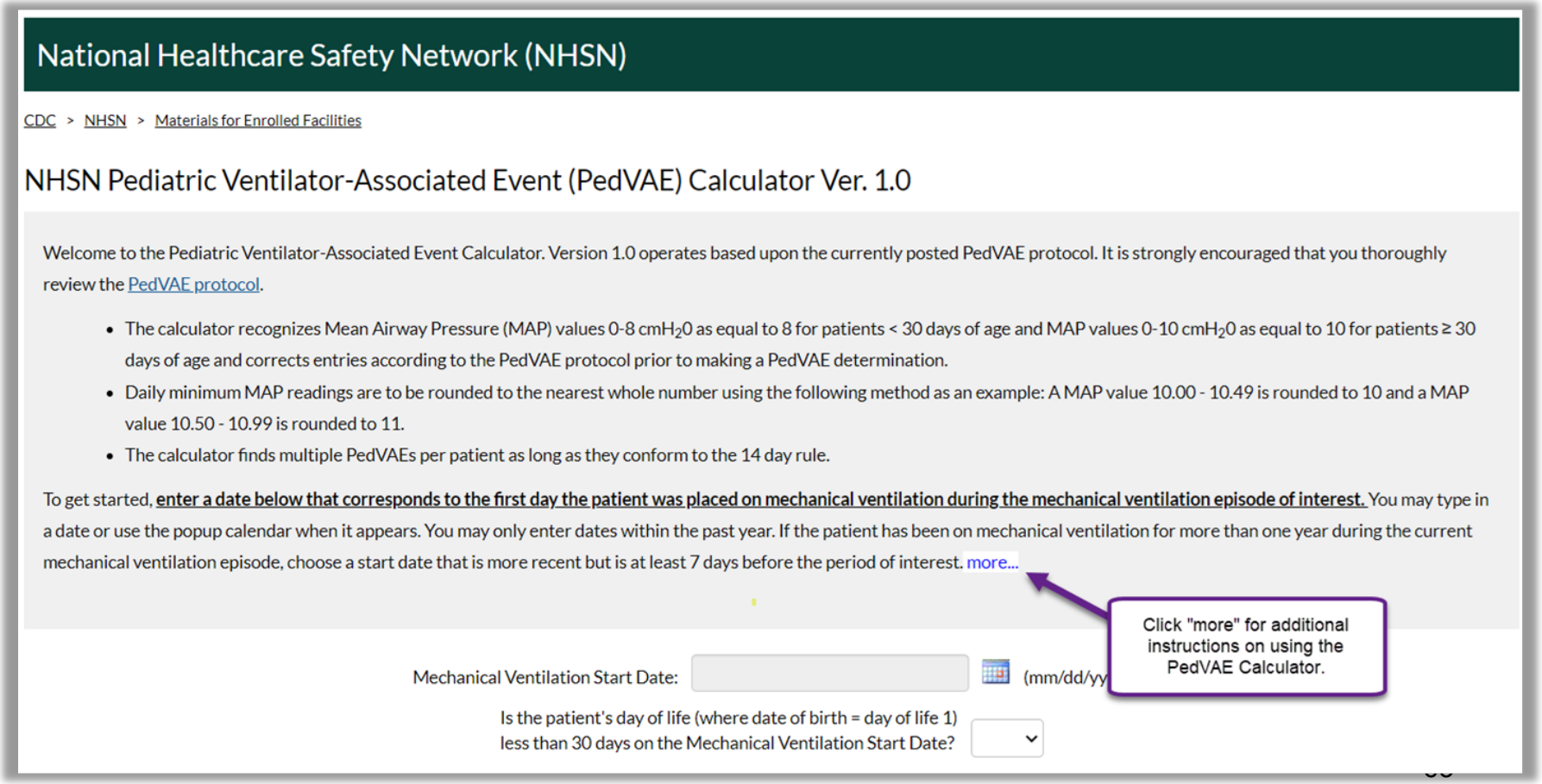


PedVAE Calculator Access- cont.

https://www.cdc.gov/nhsn/pedvae-calculator/index.html

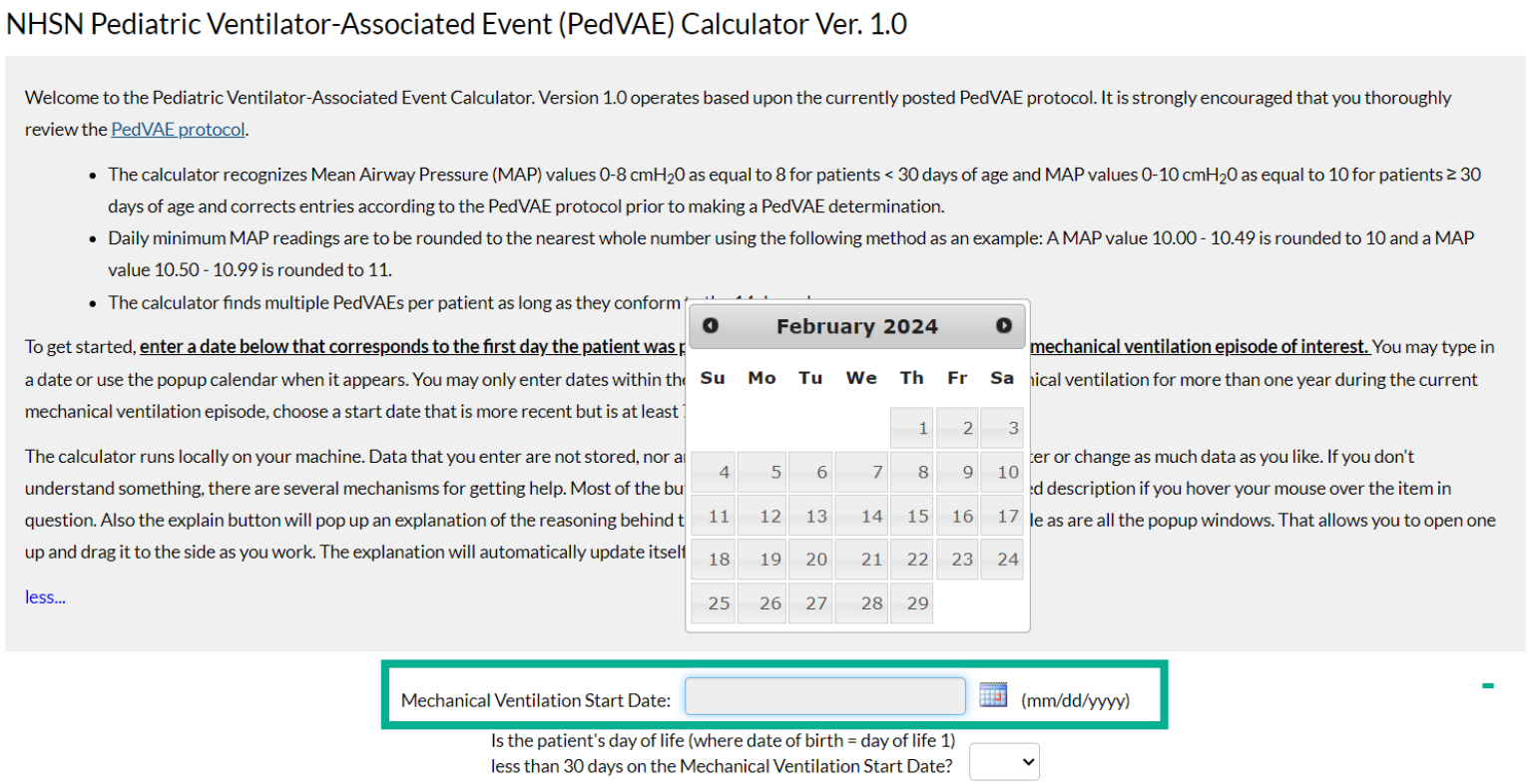


PedVAE Calculator: Instructions



Mechanical Ventilation Start Date

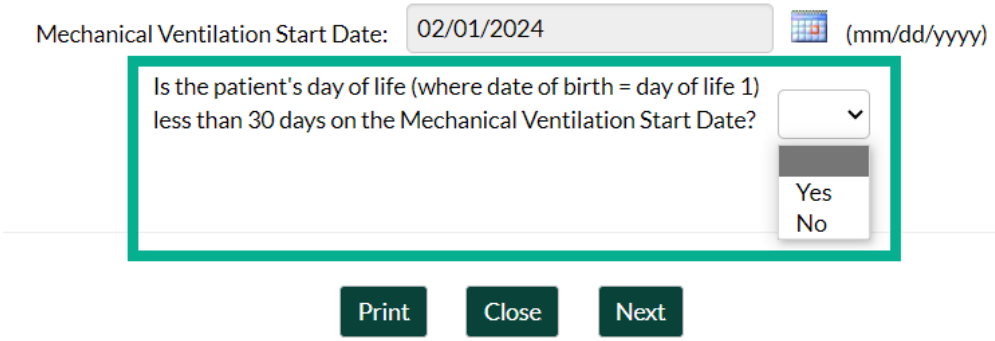
*Enter the ***actual date*** on which mechanical ventilation was initiated

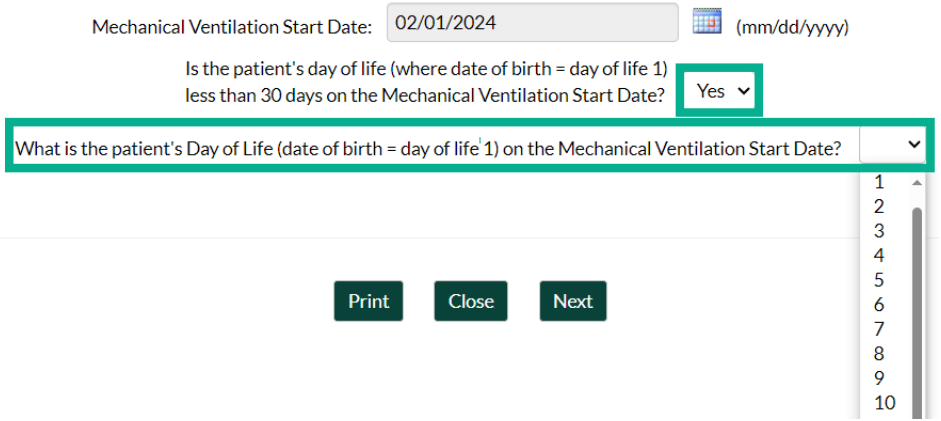


Day of Life

Used to determine which daily minimum MAP value interpretation to apply:

If the patient is less than 30 days old, you will also answer the following:

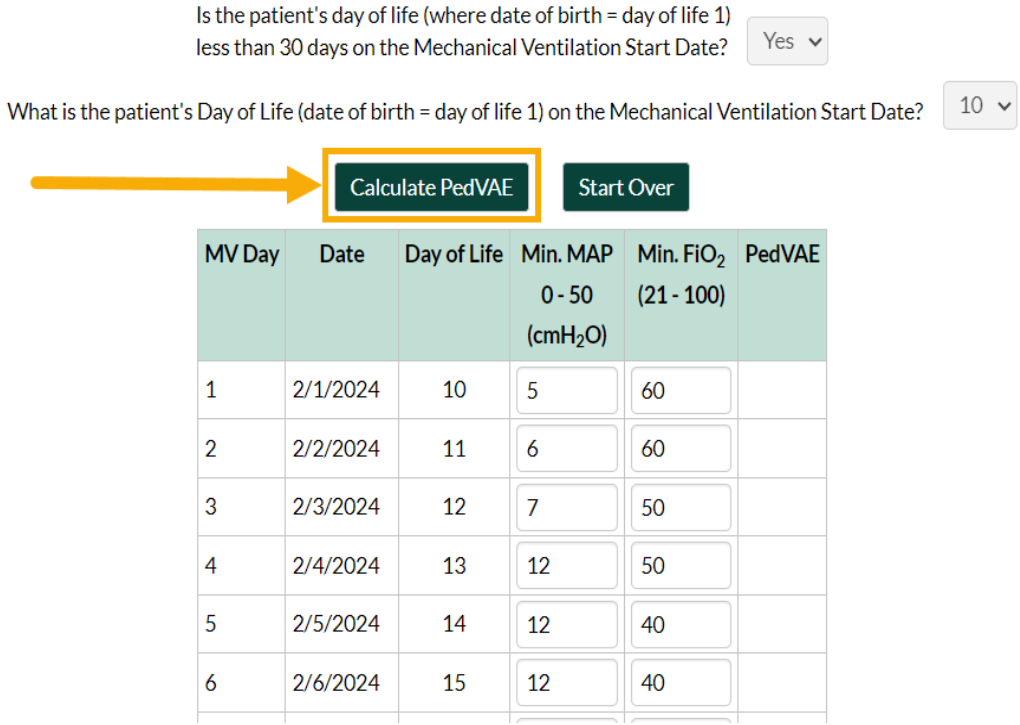




PedVAE Calculator: Patient < 30 days old

- The patient is **< 30 days** on the Mechanical Ventilation Start Date

- Enter the Daily Minimum MAP and FiO_2 values and click on **Calculate PedVAE**

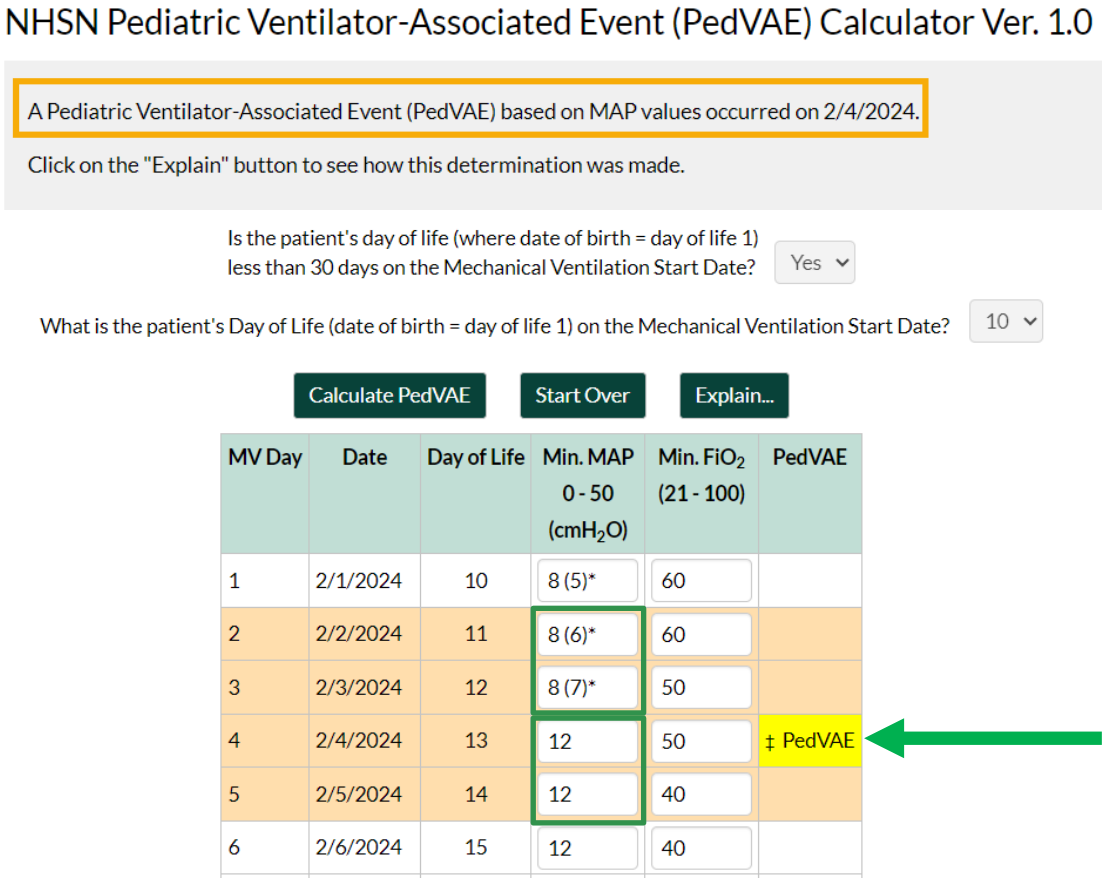


MV Day	Date	Day of Life	Min. MAP 0 - 50 (cmH_2O)	Min. FiO_2 (21 - 100)	PedVAE
1	2/1/2024	10	5	60	
2	2/2/2024	11	6	60	
3	2/3/2024	12	7	50	
4	2/4/2024	13	12	50	
5	2/5/2024	14	12	40	
6	2/6/2024	15	12	40	

PedVAE Calculator Determination
(patient < 30 days old)

- A **PedVAE** is identified in the **MAP parameter** with a date of event 2/4/2024

- The calculator interprets MAP values of 0-8 cmH_2O as equal to 8 cm H_2O since the patient is **< 30 days**


NHSN Pediatric Ventilator-Associated Event (PedVAE) Calculator Ver. 1.0

A Pediatric Ventilator-Associated Event (PedVAE) based on MAP values occurred on 2/4/2024.

Click on the "Explain" button to see how this determination was made.

Is the patient's day of life (where date of birth = day of life 1) less than 30 days on the Mechanical Ventilation Start Date? Yes

What is the patient's Day of Life (date of birth = day of life 1) on the Mechanical Ventilation Start Date? 10

Calculate PedVAE | Start Over | Explain...

MV Day	Date	Day of Life	Min. MAP 0 - 50 (cmH_2O)	Min. FiO_2 (21 - 100)	PedVAE
1	2/1/2024	10	8 (5)*	60	
2	2/2/2024	11	8 (6)*	60	
3	2/3/2024	12	8 (7)*	50	
4	2/4/2024	13	12	50	‡ PedVAE
5	2/5/2024	14	12	40	
6	2/6/2024	15	12	40	

PedVAE Calculator: Patient ≥ 30 days old

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.

- **No PedVAE is identified** because the increase in MAP is not ≥ 4 cmH_2O over the baseline period
- The calculator interprets **MAP values of 0-10 cmH_2O as equal to 10 cmH_2O for patients ≥ 30 days**
- Select the **Explain** button for an explanation of the determination

Is the patient's day of life (where date of birth = day of life 1) less than 30 days on the Mechanical Ventilation Start Date? No

Calculate PedVAE | Start Over | Explain...

MV Day	Date	Min. MAP 0 - 50 (cmH_2O)	Min. FiO_2 (21 - 100)	PedVAE
1	2/1/2024	10 (5)*	60	
2	2/2/2024	10 (6)*	60	
3	2/3/2024	10 (7)*	50	
4	2/4/2024	12	50	
5	2/5/2024	12	40	
6	2/6/2024	12	40	

Knowledge Check #5

The PedVAE calculator is only as good as the data that are entered. If incorrect data are entered, the PedVAE determination will not be correct.

A. True

B. False

Knowledge Check #5 - Rationale

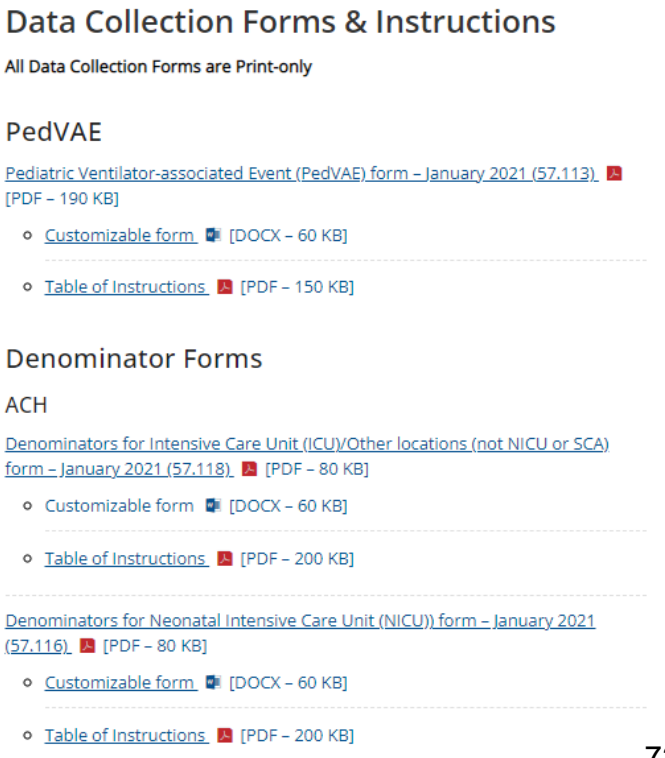
- The PedVAE calculator is only as good as the data that are entered into it.
- Garbage in = Garbage out
- If incorrect data are entered, the PedVAE calculator will provide the wrong determination.
- The PedVAE calculator is a valuable tool to assist with PedVAE determinations, but it is not a substitute for you knowing and understanding the PedVAE protocol and algorithm.

Reporting PedVAE

PedVAE Data Collection Forms and Instructions

https://www.cdc.gov/nhsn/psc/pedvae/index.html

- Event forms
- Denominator forms
  - ICU
  - NICU
- Tables of Instructions



Data Collection Forms & Instructions

All Data Collection Forms are Print-only

PedVAE

Pediatric Ventilator-associated Event (PedVAE) form – January 2021 (57.113) [PDF – 190 KB]

- Customizable form [DOCX – 60 KB]
- Table of Instructions [PDF – 150 KB]

Denominator Forms

ACH

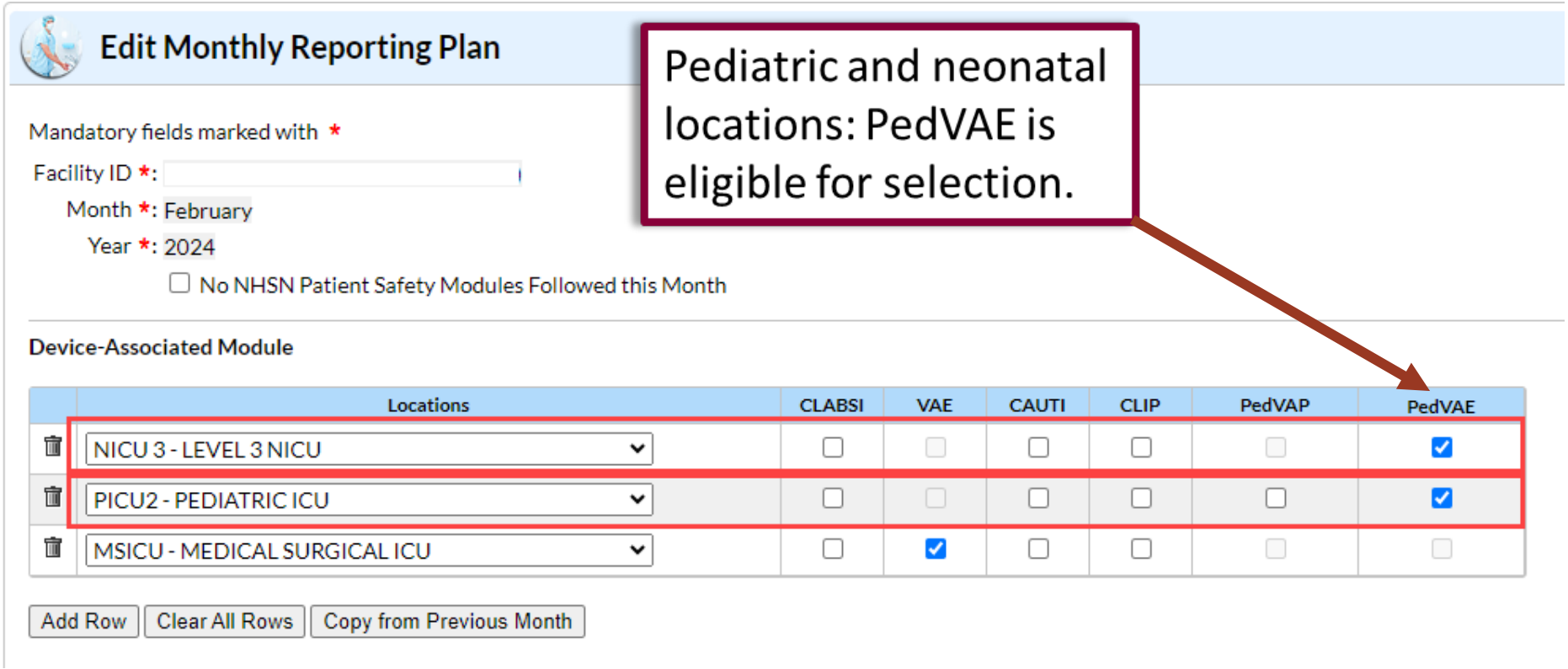
Denominators for Intensive Care Unit (ICU)/Other locations (not NICU or SCA) form – January 2021 (57.118) [PDF – 80 KB]

- Customizable form [DOCX – 60 KB]
- Table of Instructions [PDF – 200 KB]

Denominators for Neonatal Intensive Care Unit (NICU)) form – January 2021 (57.116) [PDF – 80 KB]

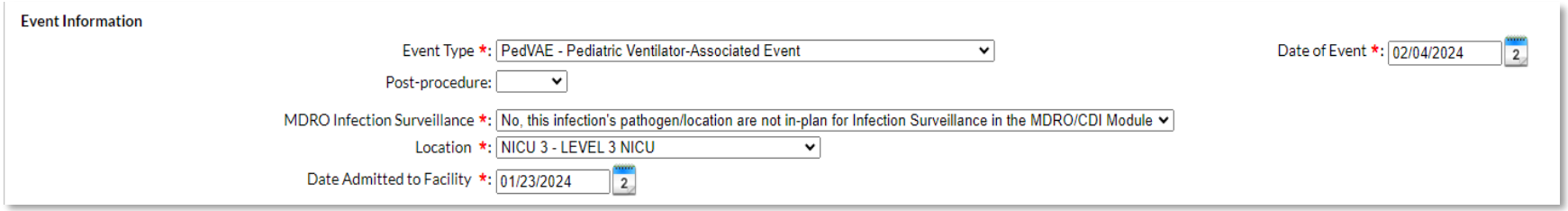
- Customizable form [DOCX – 60 KB]
- Table of Instructions [PDF – 200 KB]

PedVAE: Monthly Reporting Plan



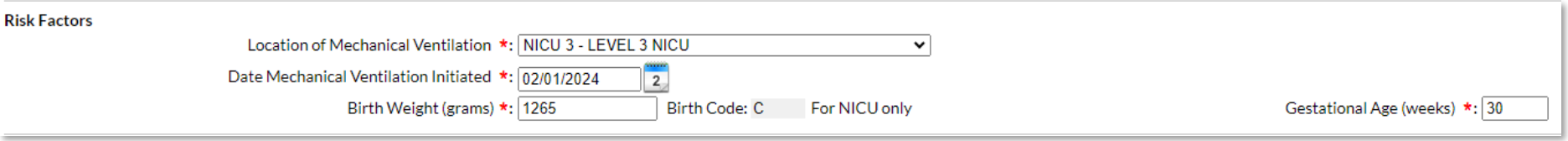
PedVAE: Event Information

- Select Event Type: PedVAE
- Fill in Date of Event
- Fill in patient's Location on the Date of Event
- For in-plan events, enter Date Admitted to Facility



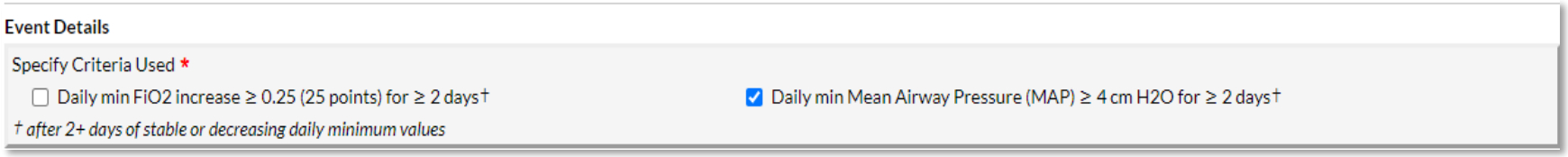
PedVAE: Risk Factors

- Enter Location of Mechanical Ventilation
- Enter Date Mechanical Ventilation Initiated
- For Neonatal Intensive Care Unit (NICU) patients
  - Birth Weight
  - Gestational Age



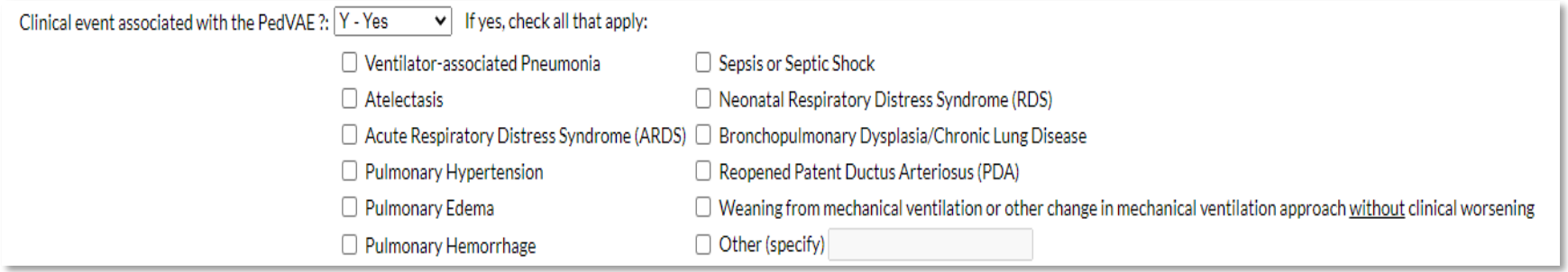
PedVAE: Event Details

- Select the specific criteria used to meet the PedVAE definition
  - FiO_2
  - MAP



PedVAE: Clinical Event

- Select “Yes” if the PedVAE is associated with any clinical diagnoses or events
- If “Yes,” check all that apply
- If “Other” is checked, there is a 200-character limit

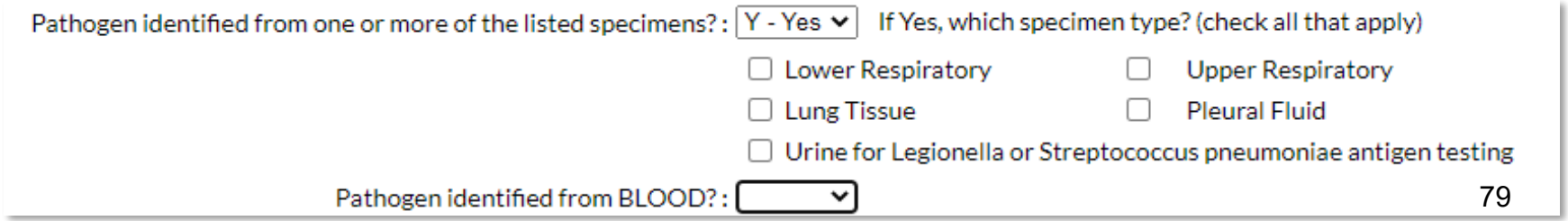


PedVAE: Antimicrobial Agents

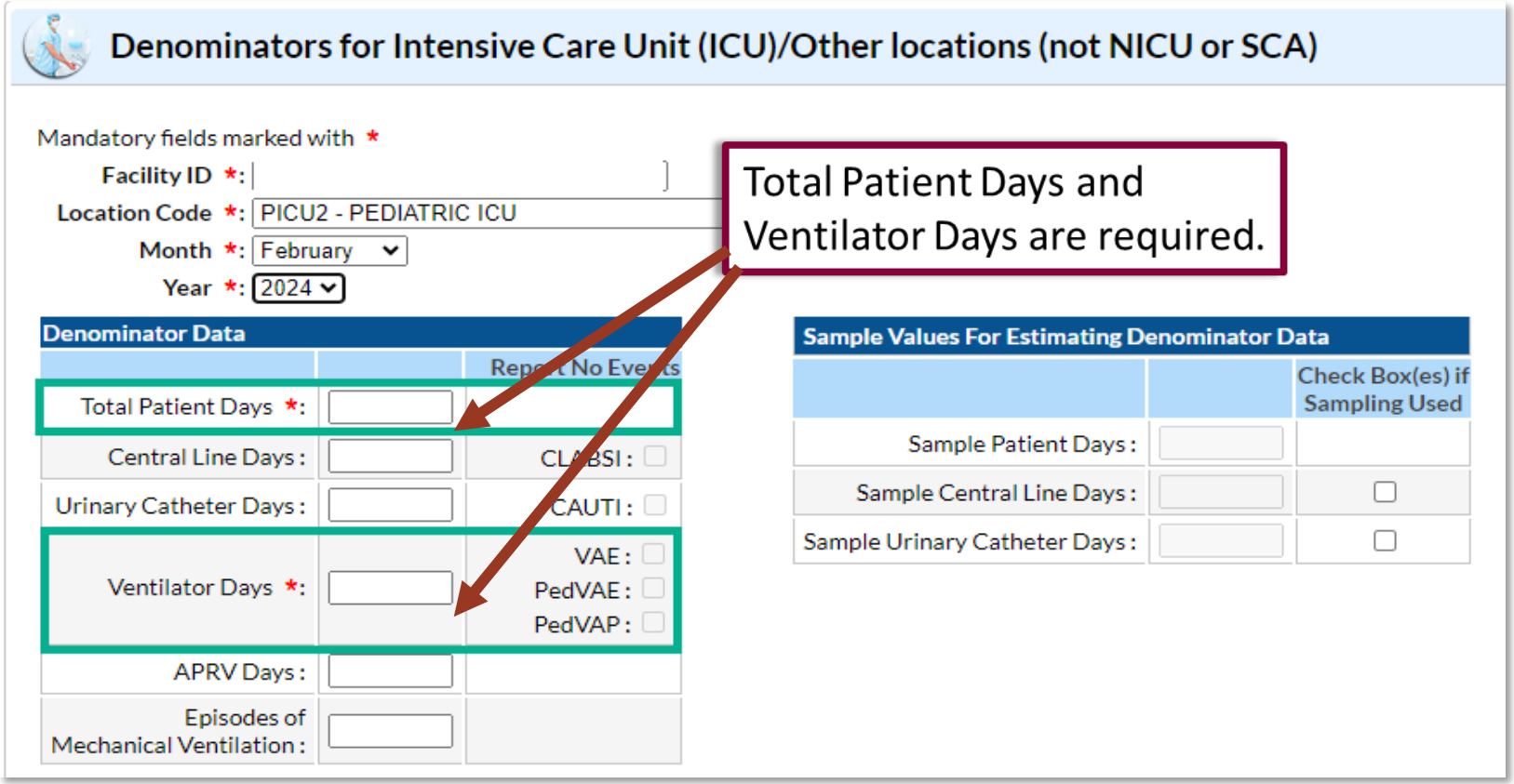
- Select “Yes” if an antimicrobial agent listed in the PedVAE Appendix was administered on the Date of Event or within 2 days before or 2 days after
- If “Antimicrobial agent(s) administered?” = Y, record drug (up to 3) and enter the Drug Start date
  - Drug Start date is limited to 1 year prior to current admission date

PedVAE: Pathogens

- Pathogen identified from listed specimens: Select “Yes” if a pathogen was detected in any of the specimen types listed with collection dates on the Date of Event or within 2 days before or 2 days after
- Pathogen identified from BLOOD: Select “Yes” if a pathogen was identified from blood with a specimen collection date within 2 days before to 13 days after the Date of Event
- If “Yes” to either, enter up to 3 pathogens



Pediatric Location Summary Data



Neonatal ICU Location Summary Data

Neonatal Intensive Care Unit

Total Patient Days and Vent Days by Birth Weight are required.

Patient Days and Vent Days by Gestational Age are optional.

Mandatory fields marked with *

Facility ID *:

Location Code *: NICU 3 - LEVEL 3 NICU

Month *: February

Year *: 2024

Birth Weights

Birth Weight	Patient Days *	CL Days	No CLABSI	Vent Days *	No PedVAE	No PedVAP	EMV	UrC Days
<=750								
751-1000								
1001-1500								
1501-2500								
>2500								

Gestational Ages

Gestational Age	Patient Days	Vent Days	No PedVAE	EMV
Extremely preterm (<28 weeks)				
Very preterm (28 to <32 weeks)				
Moderate to late preterm (32 to <37 weeks)				
Term (>=37 weeks)				

In Closing…

Summary

- Today's presentation covered the basics of PedVAE surveillance
  - Key terms
  - Daily minimum values
  - PedVAE surveillance algorithm
  - PedVAE calculator
  - PedVAE reporting

PedVAE Surveillance Resources

- Familiarize yourself with the PedVAE webpage
- Read the PedVAE protocol and the tables of instructions
- Read the PedVAE FAQs
- Review the PedVAE training resources
- Use the PedVAE calculator
- Submit questions and case reviews to the NHSN team (see closing slide for contact information)

For Questions or Concerns, Contact the NHSN Helpdesk

NHSN-ServiceNow to submit questions to the NHSN Help Desk.
The new portal can be accessed at **https://servicedesk.cdc.gov/nhsncsp**.
Users will be authenticated using CDC's Secure Access Management Services (SAMS) the same way you access NHSN. If you do not have a SAMS login, or are unable to access ServiceNow, you can still email the NHSN Help Desk at nhsn@cdc.gov.

For more information please contact Centers for Disease Control and Prevention
1600 Clifton Road NE, Atlanta, GA 30333
Telephone, 1-800-CDC-INFO (232-4636)/TTY: 1-888-232-6348
E-mail: cdcinfo@cdc.gov Web: www.cdc.gov