

## Ventilator-Associated Event Surveillance Update

Healthcare facilities can begin using the surveillance protocol for Ventilator-Associated Events (VAE) on January 1, 2013, even though NHSN will not be able to accept VAE surveillance data until mid-February 2013. VAE data collected in January and early February can be entered into NHSN retrospectively. Remember that VAE surveillance can be conducted in acute care hospitals, long term acute care hospitals, and inpatient rehabilitation facilities where denominator data (ventilator and patient days) can be collected for patients  $\geq 18$  years of age.

Conducting in-plan VAE surveillance means assessing patients for the presence of ALL events included in the algorithm from VAC to IVAC to Possible and Probable VAP. A unit conducting in-plan VAE surveillance cannot decide, for example, that only surveillance for VAC (and not for IVAC or possible or probable VAP) will be performed. Additionally, there is a hierarchy of definitions within VAE such that:

- o If a patient only meets criteria for VAC, report as VAC
- o If a patient meets criteria for VAC and IVAC, report as IVAC.
- o If a patient meets criteria for VAC, IVAC and Possible VAP, report Possible VAP.
- o If a patient meets criteria for VAC, IVAC and Probable VAP, report Probable VAP.
- o If a patient meets criteria for VAC, IVAC, Possible VAP and Probable VAP, report Probable VAP

The first official VAE training was conducted at the CDC on October 4, 2012. This training was recorded, and the recording and slides will be made available on the NHSN website. We encourage you to check the website in the coming weeks and view this training once it is available. Another helpful resource for those interested in conducting VAE surveillance is the VAE Surveillance Protocol, available in draft form at [Link destination to VAE Web page](#). The draft protocol is being made available in advance so that users may familiarize themselves with the details of the protocol. This draft protocol is preliminary and subject to change; please remember to obtain **the final version** of the surveillance protocol in January 2013.

In addition, CDC staff members are working on providing data collection tools/worksheets and an online VAE Calculator to assist users in becoming familiar with the details of the VAE definitions and surveillance methods. The worksheets will be available at this link [Link destination to VAE Web page](#) in December the calculator will follow shortly thereafter. Please see sample screen shots of the tools and calculator below.



## Ventilator-Associated Event Calculator

Welcome to the Ventilator-Associated Event Calculator. It is strongly encouraged that you read and study the VAE protocol found [here](#).

The calculator runs totally on your machine so no data is reported anywhere. 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 calculator. 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.

Patients may have multiple VAEs during a single hospitalization but only one VAE per 14 day event period. However the calculator will only detect one VAE at a time.

**To get started, click on the calendar icon and choose a date that corresponds to the first day the patient was placed on mechanical ventilation.**



Calculate VAC

Start Over

Now enter PEEP or FiO<sub>2</sub> values and when done, click the "Calculate VAC" button. **You do not need to enter data for every day.** Concentrate on the dates where you believe a Ventilator-Associated Event may be likely. If your values meet the Ventilator-Associated Condition (VAC) definition, the event day will be identified and the VAE Window will be defined.

MV Day	Date	Min. PEEP (cmH <sub>2</sub> O)	Min. FiO <sub>2</sub> (30 - 100)	VAE
1	10/15/2012			
2	10/16/2012			
3	10/17/2012			
4	10/18/2012			
5	10/19/2012	8		
6	10/20/2012	8		
7	10/21/2012	12		
8	10/22/2012	12		
9	10/23/2012	10		
10	10/24/2012			
11	10/25/2012			
12	10/26/2012			

Start Over   Go to IVAC   Explain...

A Ventilator-Associated Condition(VAC) was found on day 10/21/2012. [Click on the Go To IVAC button](#) to move to the next part of the protocol or click on the "Explain" button to see how this determination was made.

MV Day	Date	Min. PEEP (cmH <sub>2</sub> O)	Min. FiO <sub>2</sub> (30 - 100)	VAE
3	10/17/2012			
4	10/18/2012			
5	10/19/2012	8		
6	10/20/2012	8		
7	10/21/2012	12		VAC
8	10/22/2012	12		
9	10/23/2012	10		
10	10/24/2012			

Start Over   Calculate IVAC   Explain...   Go to VAP

The temperature and/or WBC criteria have been met during the VAE Window Period, and there are 4 Qualifying Antimicrobial Days (QADs) in a row. This meets the definition of an IVAC. [Click on "Go to VAP" button](#) to determine if this case conforms to a Possible or Probable Ventilator-Associated Pneumonia (VAP) definition.

MV Day	Date	Hide... Min. PEEP (cmH <sub>2</sub> O)	Hide... Min. FiO <sub>2</sub> (30 - 100)	VAE	36°> T >38°	4,000 cells/mm <sup>3</sup> ≥ WBC ≥ 12,000 cells/mm <sup>3</sup>	Add... Remove... CEFEPIME	QAD
3	10/17/2012				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4	10/18/2012				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5	10/19/2012	8			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6	10/20/2012	8			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
7	10/21/2012	12		IVAC	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	yes
8	10/22/2012	12			<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	yes
9	10/23/2012	10			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	yes
10	10/24/2012				<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	yes
11	10/25/2012				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
12	10/26/2012				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

There is a baseline period of stability or improvement of PEEP values on days 10/19/2012 and 10/20/2012 followed by two consecutive days of worsening condition where the values are 3 cmH<sub>2</sub>O or more than the period of stability. The date of the VAC is set to the first day of worsening after the baseline period.

OK

(Hint: this box is movable by dragging with your mouse. If you move it to one side and leave it open, the explanation will automatically update itself as things change.)

This depicts the "Explain" box that can be opened on every screen after the calculation is performed. This provides the explanation of how the calculator arrived at the event determination.

Start Over Explain... Calculate VAP

This conforms to a **Possible Ventilator-Associated Pneumonia** definition and should be reported as such. For a discussion of why, see/click on the Explain button.

Row	Conditions occurring within your "VAE Window" from 10/19/2012 to 10/23/2012	Yes/No
1	Purulent respiratory secretions (from one or more specimen collections) Defined as secretions from the lungs, bronchi, or trachea that contain $\geq 25$ neutrophils and $\leq 10$ squamous epithelial cells per low power field [lpf, x100].	<input checked="" type="checkbox"/>
2	Positive culture (qualitative, semi-quantitative or quantitative) of sputum, endotracheal aspirate, bronchoalveolar lavage, lung tissue, or protected specimen brush.	<input type="checkbox"/>
3	Positive pleural fluid culture (where specimen was obtained during thoracentesis or initial placement of chest tube and NOT from an indwelling chest tube).	<input type="checkbox"/>
4	Positive Lung histopathology.	<input type="checkbox"/>
5	Positive diagnostic test for Legionella spp.	<input type="checkbox"/>
6	Positive diagnostic test on respiratory secretions for influenza virus, respiratory syncytial virus, adenovirus, parainfluenza virus, rhinovirus, human metapneumovirus, coronavirus.	<input type="checkbox"/>

Two different examples are demonstrated on this page.

1. If only purulent respiratory secretions or only positive culture is checked, the user is able to calculate VAP.
2. If both purulent respiratory secretions and positive culture are checked, an additional box appears requesting further culture result detail before the calculator can determine the event type.

Start Over Explain... Calculate VAP

Indicate which of the following options (if any) represents the patient's positive culture result. When you are done, click on "OK".

<input checked="" type="checkbox"/>	Positive quantitative culture of endotracheal aspirate, $\geq 10^5$ cfu/ml or equivalent semi-quantitative result.
<input type="checkbox"/>	Positive quantitative culture of bronchoalveolar lavage, $\geq 10^4$ cfu/ml or equivalent semi-quantitative result.
<input type="checkbox"/>	Positive quantitative culture of lung tissue, $\geq 10^4$ cfu/g or equivalent semi-quantitative result.
<input type="checkbox"/>	Positive quantitative culture of protected specimen brush, $\geq 10^3$ cfu/ml or equivalent semi-quantitative result.

OK

Row	Conditions occurring within your "VAE Window" from 10/19/2012 to 10/23/2012	Yes/No
1	Purulent respiratory secretions (from one or more specimen collections) Defined as secretions from the lungs, bronchi, or trachea that contain $\geq 25$ neutrophils and $\leq 10$ squamous epithelial cells per low power field [lpf, x100].	<input checked="" type="checkbox"/>
2	Positive culture (qualitative, semi-quantitative or quantitative) of sputum, endotracheal aspirate, bronchoalveolar lavage, lung tissue, or protected specimen brush.	<input checked="" type="checkbox"/>
3	Positive pleural fluid culture (where specimen was obtained during thoracentesis or initial placement of chest tube and NOT from an indwelling chest tube).	<input type="checkbox"/>
4	Positive Lung histopathology.	<input type="checkbox"/>
5	Positive diagnostic test for Legionella spp.	<input type="checkbox"/>
6	Positive diagnostic test on respiratory secretions for influenza virus, respiratory syncytial virus, adenovirus, parainfluenza virus, rhinovirus, human metapneumovirus, coronavirus.	<input type="checkbox"/>

Start Over Explain... Calculate VAP

This conforms to a **Probable Ventilator-Associated Pneumonia** definition and should be reported as such. For a discussion of why, see/click on the Explain button.

Row	Conditions occurring within your "VAE Window" from 10/19/2012 to 10/23/2012	Yes/No
1	Purulent respiratory secretions (from one or more specimen collections) Defined as secretions from the lungs, bronchi, or trachea that contain $\geq 25$ neutrophils and $\leq 10$ squamous epithelial cells per low power field [lpf, x100].	<input checked="" type="checkbox"/>
2	Positive culture (qualitative, semi-quantitative or quantitative) of sputum, endotracheal aspirate, bronchoalveolar lavage, lung tissue, or protected specimen brush.	<input checked="" type="checkbox"/>
3	Positive pleural fluid culture (where specimen was obtained during thoracentesis or initial placement of chest tube and NOT from an indwelling chest tube).	<input type="checkbox"/>
4	Positive Lung histopathology.	<input type="checkbox"/>
5	Positive diagnostic test for Legionella spp.	<input type="checkbox"/>
6	Positive diagnostic test on respiratory secretions for influenza virus, respiratory syncytial virus, adenovirus, parainfluenza virus, rhinovirus, human metapneumovirus, coronavirus.	<input type="checkbox"/>