AHA/HRET HEN 2.0 VAE WEBINAR

VENTILATOR ASSOCIATED EVENTS: HEADED IN THE WRONG DIRECTION?
IT’S TIME TO TURN VAE AROUND!

April 26, 2016
11:00 a.m. – 12:30 p.m. CT
WELCOME AND INTRODUCTIONS

Marina Levin, Program Manager, HRET | 11:00 – 11:05
WEBINAR PLATFORM QUICK REFERENCE

Mute your computer audio →

Today’s Presentation

Chat with the Group

Download today’s slides and resources
ADDITIONAL REMINDERS

• Quality of audio (if listening through your computer) depends on your internet connection.
• To maximize the size of any one “pod,” simply press the four-way arrow icon in the top right corner.
<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
<th>Description</th>
<th>Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:00-11:05 a.m.</td>
<td>Welcome and Introductions</td>
<td>Open and housekeeping information, including review of relevant HRET HEN resources, change packages and Listserv®.</td>
<td>Marina Levin, MPH Program Manager, HRET</td>
</tr>
<tr>
<td>11:05-11:10 a.m.</td>
<td>HEN Data Update</td>
<td>Review of VAE measures and national progress toward our 40/20 HEN goals.</td>
<td>Annette Urganus Data Analyst, HRET</td>
</tr>
<tr>
<td>11:10-11:20 a.m.</td>
<td>VAE Ideas - Getting Unstuck</td>
<td>Shifting our framework to detection and data management followed by focused improvement efforts.</td>
<td>Cheryl Ruble, RN MSN CNS Improvement Advisor, Cynosure Health</td>
</tr>
<tr>
<td>11:20-11:35 a.m.</td>
<td>Surveillance Success and Confidence</td>
<td>Hospital story highlighting successful surveillance strategies that allow confidence in the data and insight to drive improvement.</td>
<td>Deborah Campbell, MSN RN-BC CPHQ Director of Infection Prevention &amp; Employee Health, Twin Lakes Regional Medical Center, Leitchfield, KY</td>
</tr>
<tr>
<td>11:35-11:45 a.m.</td>
<td>VAE Calculator 3.0 - Do Not Be Afraid!</td>
<td>Overview of the VAE Calculator, a tool to aid in surveillance and reporting.</td>
<td>Cheryl Ruble, RN MSN CNS Improvement Advisor, Cynosure Health</td>
</tr>
<tr>
<td>11:45 a.m.-12:10 p.m.</td>
<td>Deep Dive and Drive</td>
<td>Understanding the cause of a VAE requires an in depth discovery session by the care team which then drives a focused change and improvement strategy.</td>
<td>Myra Foley, BA RN CIC Infection Control Nurse II Our Lady of Lourdes RMC Lafayette, LA Maryanne Whitney, RN MSN CNS Cynosure Improvement Advisor</td>
</tr>
<tr>
<td>12:10-12:20 p.m.</td>
<td>Bring it Home</td>
<td>Action items from today’s webinar and suggestions for next steps.</td>
<td>Marina Levin, MPH Program Manager, HRET</td>
</tr>
<tr>
<td>12:20-12:30 p.m.</td>
<td>Q&amp;A</td>
<td>All</td>
<td>All</td>
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</tbody>
</table>
VAE CHANGE PACKAGE

- Modified harm definitions and resources
- Relevant updates on best practices and change ideas
- An easy-to-use, streamlined structure
- Updated Top Ten Checklist

SIGN UP TODAY: INFECTIONS LISTSERV®

• Infections Listserv® is available for:
  – Sharing of:
    • HRET Resources
    • Publically Available Resources
    • Best Practices
    • Learnings from Subject Matter Experts
  – Troubleshooting for Data Reporting and Analysis

Sign Up Here
HEN DATA UPDATE

Annette Urganus, Data Analyst, HRET | 11:05 – 11:10 am
HEN DATA UPDATE

![Graph showing data update]

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>2015-10</th>
<th>2015-11</th>
<th>2015-12</th>
<th>2016-01</th>
<th>2016-02</th>
<th>Relative reduction from baseline, most recent quarter (Dec 2015, Jan &amp; Feb 2016)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ventilator Associated Condition (VAC) (per 1,000 ventilator days)</td>
<td>3.66</td>
<td>4.67</td>
<td>4.46</td>
<td>4.54</td>
<td>3.83</td>
<td>3.34</td>
<td>10%</td>
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<tr>
<td>Number (% of hospitals reporting)</td>
<td>755 (87%)</td>
<td>673 (78%)</td>
<td>668 (77%)</td>
<td>658 (76%)</td>
<td>536 (62%)</td>
<td>388 (45%)</td>
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</tr>
<tr>
<td>Infection-Related Ventilator-Associated Complication (IVAC) (per 1,000 ventilator days)</td>
<td>1.40</td>
<td>1.64</td>
<td>1.26</td>
<td>1.39</td>
<td>1.13</td>
<td>1.16</td>
<td>-11%</td>
</tr>
<tr>
<td>Number (% of hospitals reporting)</td>
<td>762 (88%)</td>
<td>680 (78%)</td>
<td>674 (78%)</td>
<td>666 (77%)</td>
<td>542 (62%)</td>
<td>384 (44%)</td>
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</tbody>
</table>

Results for months in which data submission was less than 50% should be interpreted cautiously, as the data on which the results are based is not yet complete.
### VAE/VAC DEFINITION

<table>
<thead>
<tr>
<th>VAE: CMS HEN Evaluation Measure</th>
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</thead>
<tbody>
<tr>
<td><strong>Ventilator Associated Condition (VAC)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Measure type</strong></td>
<td><strong>Outcome</strong></td>
</tr>
<tr>
<td><strong>Numerator</strong></td>
<td>Number of events that meet the criteria of VAC; including those that meet the criteria for infection-related ventilator-associated complication (IVAC) and possible/probable ventilator-associated pneumonia (VAP)</td>
</tr>
<tr>
<td><strong>Denominator</strong></td>
<td>Number of ventilator days</td>
</tr>
<tr>
<td><strong>Rate calculation</strong></td>
<td>( \left( \frac{\text{Numerator}}{\text{Denominator}} \right) \times 1,000 )</td>
</tr>
<tr>
<td><strong>Specifications/definitions</strong></td>
<td>Available from <a href="https://www.cdc.gov/nhsn/">CDC NHSN</a></td>
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<tr>
<td><strong>Sources/Recommendations</strong></td>
<td></td>
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<tr>
<td><strong>Data source(s)</strong></td>
<td>Infection surveillance systems</td>
</tr>
<tr>
<td><strong>NHSN data transfer</strong></td>
<td>YES - for hospitals conferring rights to AHA/HRET HEN 2.0 group</td>
</tr>
<tr>
<td><strong>Baseline period</strong></td>
<td>Calendar year 2013, OR Calendar year 2014, OR Jul - Sept 2015</td>
</tr>
<tr>
<td><strong>Monitoring period</strong></td>
<td>Monthly, beginning Oct 2015</td>
</tr>
<tr>
<td><strong>CDS Measure ID(s)</strong></td>
<td>HEN2-VAE-1</td>
</tr>
<tr>
<td><strong>AHA/HRET HEN 1</strong></td>
<td><em>EOM-VAE-96a</em>¹⁷</td>
</tr>
</tbody>
</table>
# Infection-Related Ventilator-Associated Complication Definition (IVAC)

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<tr>
<th>VAE: CMS HEN Evaluation Measure</th>
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<tr>
<td>Measure type</td>
<td>Outcome</td>
</tr>
<tr>
<td>Numerator</td>
<td>Number of events that meet the criteria of infection-related ventilator-associated condition (IVAC); including those that meet the criteria for Possible/Probable VAP</td>
</tr>
<tr>
<td>Denominator</td>
<td>Number of ventilator days</td>
</tr>
<tr>
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<td>( \left( \frac{\text{Numerator}}{\text{Denominator}} \right) \times 1,000 )</td>
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<tr>
<td>CDS Measure ID(s)</td>
<td>HEN2-VAE-2</td>
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<tr>
<td>AHA/HRET HEN 1</td>
<td>EOM-VAE-96b(^18)</td>
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</table>
VAE Ideas - Getting Unstuck

Cheryl Ruble RN, MS, CNS | Improvement Advisor, Cynosure Health | 11:10 – 11:20
HAVE YOU REACHED GOAL?
Do you have 95 – 100% reliability?
What do you know?

• When and where do your patients develop VAE?

• What’s the day-to-day compliance of bundles?

• What’s in the way?
“Look and you will find it – what is unsought will go undetected”

~ Sophocles
VAC: STRATEGIES & CHALLENGES

• Surveillance dependent
• Requires daily monitoring
• Use the VAE 3.0 calculator
• VAC, IVAC or PVAP – Investigate possible causes, report findings
  – Findings drive choice of strategies
LEARNINGS...

• Bedside staff: RN, RT, MD
• Family
• Events – Big learnings come from failures
  – Concurrent
  – Root Cause
  – Team review
“I don’t feel as if I’ve learned if I haven’t failed”

~ Jamie Hyneman, MythBuster
VAC: KEY PRACTICES AND STRATEGIES

• Preventing aspiration
  ✓ Prevent gastric distention
  ✓ HOB elevation

• Reducing gastric colonization
  ✓ Subglottic suction
  ✓ Oral intubation
  ✓ Scheduled oral care
VAC : KEY PRACTICES AND STRATEGIES

• Reducing risk of contamination of respiratory equipment
  ✓ Closed systems
  ✓ HAND HYGIENE

• Weaning off ventilator ASAP
  ✓ Institute early non-invasive ventilation
  ✓ SAT/SBT
  ✓ Early mobilization
### Ideas to Test: Top Ten List

<table>
<thead>
<tr>
<th>Idea</th>
<th>In Place</th>
<th>Not Done</th>
<th>Will Adopt</th>
<th>Notes (Responsible)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Include all elements of the bundle in change nurse rounds and nurse-to-nurse reports.</td>
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<tr>
<td>Enlist a multidisciplinary approach. Nurse, physicians and respiratory therapy staff need to work together to ensure bundle items such as head of bed (HOB), spontaneous awakening trials (SAT), spontaneous breathing trials (SBT) and oral care are done according to recommendations.</td>
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<td>Elevate HOB to between 30°-45° degrees (for visual cues, designate one person to check for HOB every one to two hours).</td>
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<tr>
<td>Establish a process to perform routine oral care every two hours with antiseptic mouthwash and Chlorhexidine 0.12% percent every 12 hours (for visual cues, partner with respiratory therapy in performing oral care). Make the above oral care part of the ventilator order set as an automatic order that requires the physician to actively exclude it. Include the chlorhexidine oral care on MAR.</td>
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<tr>
<td>Include peptic ulcer disease prophylaxis (PUD) on ICU admission and ventilator order sets as an automatic order that requires the physician to actively exclude it.</td>
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<tr>
<td>Include various thromboembolic (VTE) prophylaxis on ICU admission and ventilator order sets as an automatic order that would require the physician to actively exclude it.</td>
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<tr>
<td>Invite families to participate in care by encouraging them to ask if prevention efforts have been completed, such as oral care and HOB elevation. Educate families on the risk of VAE, preventive measures put in place and what they can do to help (e.g., perform oral care or passive range of motion exercises if willing).</td>
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<tr>
<td>Perform and coordinate SAT and SBT to maximize weaning opportunities when patient sedation is minimal – coordination between nursing and respiratory therapy to manage SAT and SBT, perform daily assessment or readiness to wean and activate.</td>
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<tr>
<td>Establish a process for timely physical and occupational therapy evaluation for patients on ventilator support to establish a plan for progressive mobility.</td>
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<tr>
<td>Manage delirium by assessing patients for delirium at least once daily. Sedation should be goal-oriented and should be administered, as ordered, by the physician according to a scale such as Richmond Agitation Sedation Scale (RASS).</td>
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</table>
Make Routine

- Conserve resources by incorporating data collection into daily work
- Example:
  - VAP bundle data collection during charge nurse rounds
  - SAT/SBT routine daily coordination RT & RN
A  Assess, prevent & manage pain

B  Both spontaneous awakening trails and spontaneous breathing trials

C  Choice of analgesia and sedation

D  Delirium: assess, prevent and manage

E  Early exercise and mobility

F  Family engagement and empowerment

4/26/2016
RESOURCES

• Vanderbilt ICU Delirium and Cognitive Impairment Study Group website: www.icudelirium.org
  • ABCDEF Bundle
  • Protocols
  • Assessment tools
  • Patient and family education

• The “Wake Up and Breathe” protocol pioneered by Vanderbilt University can be found at: http://www.mc.vanderbilt.edu/icudelirium/docs/WakeUpAndBreathe.pdf
RESOURCES

• HRET HEN Infections LISTSERV® Sign up at http://www.hret-hen.org/inc/dhtml/listserv.dhtml

• HRET HEN VAE Resources and Change Package http://www.hret-hen.org/topics/ventilator-associated-event.shtml

• HRET HEN Iatrogenic Delirium Resources and Change Package http://www.hret-hen.org/topics/iatrogenic-delirium.shtml
Surveillance Confidence and Success: Hospital Story
Deborah Campbell MSN RN-BC CPHQ, Twin Lakes Regional Medical Center
11:20 – 11:35
OUR VAE SURVEILLANCE JOURNEY

• Gathering the stakeholders
  – Our strengths/opportunities
• Assessing current state
• Education on EBP/bundle
• Oral care product upgrade-standardization
• From retrospective to concurrent
• Creating a tool
• Sharing the responsibilities- how we do it
  – Q2 hours (8, 12, 4, etc v. 10, 2, 6) PLUS...
## CCU VAE Bundle Compliance Check List

<table>
<thead>
<tr>
<th>Name:</th>
<th>Month/Year:</th>
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<tbody>
<tr>
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</table>

<table>
<thead>
<tr>
<th>Vent Day</th>
<th>Date</th>
<th>Time</th>
<th>Oral care kit present in pt's room and started @ 8AM.</th>
<th>Oral care q2 hrs unless contraindicated</th>
<th>HOB @ 30 - 45 degrees unless contraindicated</th>
<th>Stress Ulcer Prophylaxis</th>
<th>Thromboembolic Prevention</th>
<th>Feeding (Y/N)</th>
<th>Sedation (Y/N)</th>
<th>Sedation Vacation - weaning plan</th>
<th>Yankauer Device Care - rinse with sterile water/saline after use</th>
<th>ETT repositioned/tape changed daily and dated by RT (Night shift)</th>
<th>FIO2 0001 daily minimum</th>
<th>PEEP 0001 daily minimum</th>
<th>Initials</th>
</tr>
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</table>
DATA AND FOLLOW-UP

• Culture of Safety- OK to remind, prompt each other
• Any breaches are considered “teachable moments”
  – “Just in time” teaching done, when appropriate
• If criteria is met for a VAE, IP becomes directly involved
  • Calculator is used
  • Daily rounding
• Feedback on compliance measures - NEXT
VAE Calculator 3.0 - Do Not Be Afraid!
Cheryl Ruble RN, MS, CNS Improvement Advisor, Cynosure Health | 11:35 – 11:45
THREE DEFINITIONS/TIERS

Ventilator-Associated Condition (VAC)

Infection-Related Ventilator-Associated Complication (IVAC)

Possible and Probable VAP (PVAP)
VAE Surveillance Algorithm

Baseline period of stability or improvement, >2 days stable or decreasing FiO2 or PEEP – followed by increase Fio2 > 0.20 or > 3cmH2) PEEP sustained > 2 days

Ventilator-Associated Condition (VAC)

Infection-related Ventilator-Associated Complication (IVAC)

Possible Ventilator-Associated Pneumonia (PVAP)
Breaking it down...VAC

Baseline period of stability or improvement, \( \geq 2 \) days stable or decreasing FiO2 or PEEP – baseline period is 2 calendar days immediately preceding the first day of increased daily minimum PEEP or FiO2

AND

Followed by increase FiO2 \( \geq 0.20 \)

OR

\( \geq 3 \text{cmH2O} \) PEEP sustained \( \geq 2 \) days

Ventilator-Associated Condition (VAC)
Breaking it down...IVAC

**Patient meets criteria for VAC**

**AND**

**On or after day 3 and within 2 days before or after onset of worsening oxygenation**

patient meets **BOTH** criteria:

1. **Temp > 38°C or < 36°C, OR WBC > 12k or < 4k**

   **AND**

2. **New antimicrobial agent started & continued for > 4 days**

**Infection-related Ventilator-Associated Complication (IVAC)**
Possible Ventilator-Associated Pneumonia (PVAP)

Patient meets criteria for VAC & IVAC

On or after day 3 and within 2 days before or after onset of worsening oxygenation

ONE of the following criteria:

1. Positive culture

OR

2. Purulent respiratory secretions + organisms identified from sputum, endotracheal aspirate, bronchoalveolar lavage, lung tissue, protected specimen brush

OR

3. One of the following positive tests: organism identified from pleural fluid, lung histopathology, diagnostic test for legionella, diagnostic test on respiratory secretions for certain viruses
• 2 days of stability of PEEP and FIO2 followed by worsening oxygenation
• Does require daily monitoring
• Use the VAE 3.0 calculator!
• Don’t re-invent the wheel!

Welcome to the Ventilator-Associated Event Calculator. Version 3.0 operates based upon the currently posted (January 2015) VAE protocol. It is strongly encouraged that you read and study the VAE protocol found here.

- The calculator recognizes PEEP values ≤ 5 and corrects entries according to the VAE protocol prior to making a VAC determination.
- For periods of time where a patient is on APRV or a related type of mechanical ventilation for a full calendar day, a daily minimum PEEP value should not be entered into the calculator (i.e., do not enter zero)
- The calculator finds multiple VAEs 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 so no data are 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.

Mechanical Ventilation Start Date: [ ] (mm/dd/yyyy)
Ventilator-Associated Event (VAE) Calculator Ver. 3.0

Now enter PEEP and/or FiO₂ 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.

<table>
<thead>
<tr>
<th>MV Day</th>
<th>Date</th>
<th>Min. PEEP (cmH₂O)</th>
<th>Min. FiO₂ (30 - 100)</th>
<th>VAE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1/1/2015</td>
<td>4</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1/2/2015</td>
<td>3</td>
<td>30</td>
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<tr>
<td>3</td>
<td>1/3/2015</td>
<td>5</td>
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<td>1/17/2015</td>
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**VAE Surveillance Algorithm**

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Ventilator-Associated Condition (VAC)

Infection-related Ventilator-Associated Complication (IVAC)

Possible Ventilator-Associated Pneumonia (PVAP)
**Ventilator-Associated Event (VAE) Calculator Ver. 3.0**

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<td>1</td>
<td>1/1/2015</td>
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<td>30</td>
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</table>
### Ventilator-Associated Event (VAE) Calculator Ver. 3.0

**A Ventilator-Associated Condition (VAC) based on PEEP values occurred on 1/6/2015**

*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.*

<table>
<thead>
<tr>
<th>MV Day</th>
<th>Date</th>
<th>Min. PEEP (cmH₂O)</th>
<th>Min. FiO₂ (30 - 100)</th>
<th>VAE</th>
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</tbody>
</table>

**Explanation:**
The two days preceding 1/6/2015 are the baseline period of stability or improvement followed by a sustained period (≥ 2 days) of worsening oxygenation.

(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.)
# Ventilator-Associated Event (VAE) Calculator Ver. 3.0

Now that a VAC determination has been made, enter yes (check) or no (leave box unchecked) if the patient has a temperature > 38°C or < 36°C or a WBC ≥ 12,000 cells/mm³ or ≤ 4,000 cells/mm³ within the VAE Window Period. Choose a drug from the drop down list and **check all the corresponding days shown on the screen** that the agent was administered. If more than one drug was given over the course of treatment, click on the “Add...” button in the drug column header and do the same. Once all data have been entered, **click the “Calculate IVAC” button.**

<table>
<thead>
<tr>
<th>MV Day</th>
<th>Date</th>
<th>Min. PEEP (cmH₂O)</th>
<th>Min. FiO₂ (30 - 100)</th>
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<th>T&lt;36° or T&gt;38°</th>
<th>WBC≤4,000 or WBC≥12,000 cells/mm³</th>
<th>QAD</th>
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</tr>
</tbody>
</table>

**Legend:** VAE Window, VAE Date, Qualifying Antimicrobial Day (QAD), Cumulative QAD

* All values of PEEP less than 5 cmH₂O are considered to be 5 cmH₂O for purposes of the VAC definition. So for PEEP values entered as less than or equal to 5 cmH₂O, an increase in the daily minimum PEEP to at least 5 cmH₂O, sustained for 2 or more calendar days, is required to meet the VAC definition.
## Ventilator-Associated Event (VAE) Calculator Ver. 3.0

An IVAC was found for this patient. Click on the "Go To PVAP" button to go to the next part of the definition or click on the "Explain..." button for an explanation of how this determination was made.

### Explanation

A temperature box is checked within the VAE Window for the VAE on 1/6/2015 so this meets the first part of the IVAC definition. For the VAE on 1/6/2015 There are at least 4 Qualifying Antimicrobial Days. Therefore this is an IVAC.

An explanation of how to count QADs for the VAE on 1/6/2015 follows:

The drug administered box is checked on day 1/3/2015 for the drug Levofloxacin. This drug was administered prior to the VAE Window and therefore is not considered a Qualifying Antimicrobial Day (QAD).

The drug administered box is checked on day 1/4/2015 for the drug Levofloxacin. This is not a QAD since it is neither a new drug start nor did a QAD occur in the proceeding two days.

The drug administered box is checked on day 1/5/2015 for the drug Levofloxacin. This is not a QAD since it is neither a new drug start nor did a QAD occur in the proceeding two days.

The drug administered box is checked on day 1/6/2015 for the drug Levofloxacin. This is not a QAD since it is neither a new drug start nor did a QAD occur in the proceeding two days.

The drug administered box is checked on day 1/7/2015 for the drug Levofloxacin. This is not a QAD since it is neither a new drug start nor did a QAD occur in the proceeding two days.

The drug administered box is checked on day 1/8/2015 for the drug Levofloxacin. This is not a QAD since it is neither a new drug start nor did a QAD occur in the proceeding two days.

The drug administered box is checked on day 1/9/2015 for the drug Imipenem/Cilastatin. This is a new drug start since this drug was administered 2 days ago. The intervening day 1/6/2015 is also a QAD by the one day skip rule.

The drug administered box is checked on day 1/9/2015 for the drug Imipenem/Cilastatin. This is a QAD since this drug was administered 2 days ago. The intervening day 1/8/2015 is also a QAD by the one day skip rule.

There are 5 Qualifying Antimicrobial Days (QADs) in a row.

Click "OK" to close the explanation dialog.

---

<table>
<thead>
<tr>
<th>MV Day</th>
<th>Date</th>
<th>Min. PEEP (cmH₂O)</th>
<th>Min. FiO₂ (30 - 100)</th>
<th>VAE</th>
<th>T&lt;36° or T&gt;38°</th>
<th>QAD</th>
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*All values of PEEP less than 5 cmH₂O are considered to be 5 cmH₂O for purposes of at least 8 cmH₂O, sustained for 2 or more calendar days, is required to meet the VAE definition.*
# Ventilator-Associated Event (VAE) Calculator Ver. 3.0

Now that an IVAC determination has been made, click the checkbox experienced any of the listed conditions within the VAE Window (share). Then click on the "Calculate PVAP" button.

<table>
<thead>
<tr>
<th>MV Day</th>
<th>Date</th>
<th>Min. PEEP (cmH₂O)</th>
<th>Min. FiO₂ (30 - 100)</th>
<th>VAE</th>
<th>T&lt;36° or T&gt;38°</th>
<th>WBC&lt;4,000 or WBC≥12,000 cells/mm³</th>
<th>LEVOFLOXACIN</th>
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</tbody>
</table>

**Legend:** VAE Window | VAE Date | Qualifying Antimicrobial Day (QAD) | Continuation

* All values of PEEP less than 5 cmH₂O are considered to be 5 cmH₂O for purposes of the VAC definition. So for PEEP values entered as less than 6 cmH₂O, sustained for 2 or more calendar days, is required to meet the VAC definition.

---

**PVAP Determination**

For the IVAC on **1/6/2015**, did the patient have documentation of any of the following findings during the VAE Window: **1/4/2015** to **1/8/2015**.

- **Yes**

**Criterion 1. Positive culture of one of the following (without requirement for purulent respiratory secretions):**
- Endotracheal aspirate $\geq 10^5$ cfu/ml
- Bronchoalveolar lavage $\geq 10^4$ cfu/ml
- Lung tissue $\geq 10^4$ cfu/ml
- Protected specimen brush $\geq 10^3$ cfu/ml

* or corresponding semi-quantitative result

**Criterion 2. Positive culture of one of the following (qualitative or quantitative/semi-quantitative culture without sufficient growth to meet Criterion 1):**
- Sputum
- Endotracheal aspirate
- Bronchoalveolar lavage
- Lung tissue

**AND**

Evidence of purulent respiratory secretions (defined as secretions from lungs, bronchi or trachea that contain $\geq 25$ neutrophils and $\leq 10$ squamous epithelial cells).

**Criterion 3. One of the following positive tests (as outlined in the protocol):**
- Pleural fluid culture
- Lung histopathology
- Diagnostic test for *Legionella* species
- Diagnostic test for influenza virus, respiratory syncytial virus, adenovirus, parainfluenza virus, rhinovirus, human metapneumovirus or coronavirus.

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**American Hospital Association**

**Educational Trust**
In Partnership with AHIA
### Ventilator-Associated Event (VAE) Calculator Ver. 3.0

The event on 1/6/2015 conforms to a Possible Ventilator-Associated Pneumonia (PVAP) definition. For a discussion of why, click on the Explain button.

#### Criterion 1
Clicking "Yes" to any of the three criteria is sufficient to meet the definition of a Possible Ventilator-Associated Pneumonia (PVAP) for the event on 1/6/2015.

(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.)

#### Legend
- **VAE Window**: VAE Date
- **Qualifying Antimicrobial Day (QAD)**: QAD
- **Cumulative QAD**: Cumulative QAD

#### Table
<table>
<thead>
<tr>
<th>MV Day</th>
<th>Date</th>
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*All values of PEEP less than 5 cmH₂O are considered to be 5 cmH₂O for purposes of the VAE definition. So for PEEP values entered as less than or equal to 5 cmH₂O, an increase in the daily minimum PEEP to at least 8 cmH₂O, sustained for 2 or more calendar days, is required to meet the VAE definition.*
Your Experience with VAE Calc. 3.0?
Deep Dive and Drive: Hospital Story

Myra Foley, BA, RN, CIC, Our Lady of Lourdes RMC | 11:45–11:55
ABOUT US

Our Lady of Lourdes Regional Medical Center is a subsidiary of the Franciscan Missionaries of Our Lady Health System, which is the largest locally-owned, not-for-profit health system in Louisiana. We have been in operation for more than 60 years. We are an acute care hospital with 186 beds; 18 of which are ICU beds.
Instituted IHI Ventilator Bundle protocol many years ago.
Began with informal daily patient rounds to discuss the bundle compliance. Rounds included unit manager, staff nurses, pharmacy and infection prevention.
Good compliance noted with the head of the bed elevation, peptic ulcer and deep vein prophylaxis components.
Struggled with the daily sedation vacation and daily oral care.
  - Staff reluctant to attempt daily sedation vacations.
  - Oral care often missed during busy, hectic days.
Monitored compliance with bundle, provided feedback to ICU staff. Still unable to move the bar.
In 2015 – started more formal daily interdisciplinary rounds. Team expanded to include: intensivist, unit manager, staff nurses, pharmacy, infection prevention, case management, dietary, physical therapy and pastoral care.

- Created a detailed Interdisciplinary Rounds Checklist – completed for each patient.
- CHG mouthwash added to the MAR, requiring scanning for administration. Improved compliance with oral care.
- Intensivists took ownership of the sedation vacation/ABCD protocol and necessary staff engagement.
  - Dramatically decreased vent days, weaning became more timely and efficient.
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<th><strong>Ventilator weaning/ABCb</strong></th>
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<td>*Peridex oral care Q 12 hrs.</td>
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<td><strong>Invasive Line Bundle</strong></td>
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<td>• If yes - can a PIV be obtained?</td>
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<td>• If no - can we use a midline?</td>
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<td>• Is foley present? Can it be removed?</td>
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<td>• Urinary retention protocol?</td>
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<td><strong>Meds reviewed (ASA; BB; statin etc.)</strong></td>
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<td><strong>Meds - PO, NGT, OGT - are they correct if pt NPO??? Esp. stroke pts</strong></td>
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<td><strong>Mobilization assessed—PT/OT</strong></td>
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<td><strong>Patient risks assessed / Barriers</strong></td>
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<td><strong>Discharge Plan - Care Coordinator specific input</strong></td>
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<td><strong>Flu/Pneumonia done?</strong></td>
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<td><strong>AMA labs and xray addressed?</strong></td>
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### Interdisciplinary Rounds Checklist (updated 4/7/2016)

**Pt. Label:**

**MD:**

**Week Starts:**

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BARRIERS AND HOW WE RESOLVED

• Staff buy in and consistency presented some early barriers. This was addressed by:
  – Frequent education on the importance of the bundles.
  – Intensivist driving the daily rounds and promoting a “no excuses:” environment.
  – The ICU staff became “owners” of their processes.

• Initial push back from the intensivist on the NHSN VAE definition (PEEP and FIO2 components) and the dictating of practice.
  – Several one-on-one education sessions with the intensivists, respiratory manager and ICU manager resolved the issues.
MEASURES – WHAT & HOW

• Vent days compiled within 5 days after the month end.
• NHSN VAE definitions followed and VAE calculator utilized to determine VAEs.
• Patient specific information and data shared monthly with the intensivists, ICU manager and respiratory manager.
• Quarterly rates submitted to the Infection Control Committee and the Performance Improvement Committee.
ICU Ventilator Associated Event Rates / 1000 Ventilator Days
2015 rate decreased to 5.81 from 2014 rate of 12.5.

Data Source: Infection Control
2/3/16

ICU Ventilator Associated Pneumonia (VAP) Rates / 1000 Ventilator Days
2015 rate decreased to 0.0 from 2014 rate of 1.45.

Data Source: Infection Control
2/3/16

ICU Ventilator Device Utilization Rate
2015 rate decreased to 0.46 from 2014 rate of 0.47.

Data Source: Infection Control
2/3/16
We celebrated: No VAEs in ICU in January and February 2016.

• However, the proverbial “bumps in the road” occurred in March:
  – 2 PVAP (Possible vent-associated pneumonias)

What we are doing now:
• Individual case reviews and defect analysis instituted in April.
• All disciplines involved in the patient care attend an hour session to discuss the case and what we could have done better.
• Action plans established.
# Defect Analysis Tool

## Patient Information

<table>
<thead>
<tr>
<th>Date</th>
<th>Unit</th>
<th>VENT</th>
<th>PEEP/FIO2 CHANGES **</th>
<th>PEEP</th>
<th>FIO2</th>
<th>VAE</th>
<th>TEMP &lt;36° OR &gt;38°</th>
<th>WBC &lt;4000 OR &gt;12,000</th>
<th>Antibiotics</th>
<th>Culture</th>
<th>Specimen Details/Criterion Met</th>
<th>Clinical Notes</th>
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**The VAE Triggers:**

A) On a Vent >2 days  
B) Stable Vent Settings for 2+ days  
C) An increase in PEEP ≥3 for 2 or more consecutive days  
D) An increase in FIO2 ≥20 for 2 or more consecutive days
ADVICE FOR OTHERS

- A physician champion is a must.
- Staff buy in needs to happen.
- Educate, educate, educate.
- Monitor in real time or as close to the event as possible.
- Do case reviews in a timely fashion so the patient is still fresh in everyone’s mind.
- Make the case review personal. Tell the patient’s story.
WRAP UP AND NEXT STEPS

• We’ve had ups and downs.
• We are back on track!
• Our plan:
  – A sustained VAE rate of ZERO!
  – Better patient outcomes,
  – ...and bigger celebrations!

• Questions?

• Contact Info: myra.foley@lourdesrmc.com
Deep Dive and Drive

Maryanne Whitney, MS, RN, CNS, Improvement Advisor, Cynosure Health | 11:55–12:10
JUST HAD TO REPORT A VAC, IVAC OR VAP?

KEEP CALM
AND
PUT YOUR
HEAD IN
THE SAND
BEGIN A DEEP DIVE

• **S** - VAP in the ICU
• **B** - Pt intubated in the field for respiratory distress admitted 5 days ago with community acquired pneumonia (CAP) - pt responding well to antibiotics initially type of pt day3 pt is increased peep and FIO2
• **A** - mVAE calculator identifies VAP on day 5 due to lab and sputum findings
• **R** - Arrange a bedside debriefing to enhance learning and improvement
BEDSIDE DEBRIEFING

- Be curious, and use for learning and creating opportunities for change
- What can be learned by asking and listening?
Aspiration Evaluation

☐ Maintained head-of-bed elevation at an angle of 30º to 45º continuously
☐ Used sedatives sparingly
☐ Tube-feeding present: if yes
☐ Placement & GI Intolerance assessed 4-hour intervals
☐ Bolus feedings avoided
☐ Swallowing evaluation before oral feedings started
Gastric Colonization Evaluation

☐ Teeth, gums and tongue brushed twice/day
☐ Oral moisturizing to oral mucosa and lips applied every 2 to 4 hours
☐ Oral chlorhexidine gluconate (0.12%) rinse twice a day
☐ Endotracheal cuff pressures maintained at an appropriate level
☐ Secretions cleared from above the cuff before repositioning patient or cuff deflation
☐ Subglottic suction ETT
Respiratory Equipment Evaluation

☐ Closed ventilatory circuit maintained
☐ Current HH scores for the department?
Ventilatory Weaning Evaluation

☐ Patient mobilized as indicated by protocol
☐ ABCDEF Bundle in place
☐ SAT/ SBT completed every day
WHERE ARE THE OPPORTUNITIES?

• Aspiration
  – Gastric distention and TF intolerance day 2
  – HOB elevation unknown prior to admission

• Colonization
  – Unknown subglottic suction performed

• Equipment contamination
  – HH scores are low
  – Pt transported to CT scan x2 with transport ventilator

• Ventilatory weaning
  – Pt mobilized- dangled on day 2 but not on day 3 or 4
  – Pt became (+) for delirium on day 4 as well
Bridging the Gap to Better Outcomes:
A Gap Analysis for Reducing Ventilator-associated Events (VAE)

Using the scales below, determine how well your current care of ventilated patients corresponds to our evidence-based recommendations. If you’re not quite there yet, make incremental changes toward this goal by trying the suggestions offered.

1. To what degree has your hospital/unit fostered a culture of nurse “accountability” regarding VAE rates?

   Not at all  ▲  Always

   Need help getting there?
   □ Regularly educate clinicians about their role in VAE prevention, and reinforce learning
   □ Emphasize hand hygiene and implement surveillance, as this has been shown to improve compliance
   □ Institute “intentional rounds” with nurses to discuss all aspects of a patient’s care at the bedside
     □ Focus on prevention and key nurse-sensitive metrics (e.g., VTE, UTI, PU)

2. To what degree does your hospital/unit follow guidelines or policies to prevent aspiration?

   Not at all  ▲  Always

   Need help getting there?
   □ Use cuffed tubes and continuous aspiration of subglottic secretions (CASS)
     □ If cuffed tubes are not available, collaborate with your manager, product committee, or appropriate group to have these stocked
     □ Partner with management or other groups to compare costs of CASS tubes with VAP-related costs
   □ Monitor and maintain cuff pressures ~20 cm H₂O
   □ Audit and educate staff frequently about using bed-level indicators and appropriate backrest elevation to achieve HOB 30–45°
     □ Collaborate with team and manager to have permanent markings placed on the walls at 30-45° to facilitate compliance
   □ Prevent gastric overdistention

Resources:
- Tools and Tactics
- Webinar Series Learn
  Network discussion forum

Resources:
- Tools and Tactics
- AACN Practice Alerts:
  □ Prevention of Aspiration
  □ Audit of HOB Elevation in Intubated Patients
- Webinar Series Learn
  Network discussion forum

Proactively Preventing Ventilator-associated Events (VAE)  Copyright © 2014 American Association of Critical-Care Nurses
3. How consistently does your hospital/unit follow measures to reduce gastric colonization in patients?

Not at all | Always
--- | ---

**Need help getting there?**

- Collaborate with staff to determine a consistent approach for performing regular oral care, including timing and type (evidence about frequency is unresolved)
- Discuss with unit leadership adding “oral care” to the daily care in your unit
- Identify champions within Anesthesia or Emergency departments to promote the use of orotracheal instead of nasal intubation to reduce the risk of sinusitis
  - Educate staff to request oral intubation
  - Review your facility’s protocol for intubations to see if it stresses the oral route. If it doesn’t, collaborate with anesthesiologists and/or ED to establish goals; then work with the appropriate committee to update the protocol. If no protocol exists, work with the practice committee or other groups to develop one
  - Work with unit leadership to raise awareness among other units about the value of orotracheal versus nasal intubation; communicate your unit’s desire to intubate orally

**Resources:**
- Tools and Tactics
- AACN Practice Alert: Oral Care for Patients at Risk for Ventilator-associated Pneumonia (VAP)
- Webinar Series Learn Network discussion forum

4. Are guidelines or protocols followed to reduce the risk of contamination of respiratory equipment?

Not at all | Always
--- | ---

**Need help getting there?**

- Change tubing and equipment only when visibly soiled
- Use sterile water when rinsing reusable respiratory equipment, and properly disinfect and store it
- Collaborate with Respiratory Care to ensure that these recommendations are implemented and monitored

**Resources:**
- Tools and Tactics
- Webinar Series Learn Network discussion forum
5. How consistently does your hospital/unit track and prevent complications of mechanical ventilation?

- Not at all
- Sometimes
- Usually
- Always

Need help getting there?
- Facilitate early mobility in patients to avoid complications (e.g., VTE, UTI, PU)
- Discuss with relevant physician groups (e.g., pulmonology, cardiology, intensivists) the prospect of implementing a policy to evaluate patients for noninvasive ventilation before intubating
  - Identify champions and work with them to develop protocols for indications and uses of noninvasive ventilation
- Prevent unplanned extubations and reintubations. Instead of using physical restraints (which don’t prevent unplanned extubation—a common misconception):
  - Use pharmacologic agents sparingly
  - Assess for delirium
  - Don’t delay spontaneous breathing trials (SBTs), if indicated
- Minimize the use of sedation, and discontinue as soon as possible
  - Educate staff about the misconceptions around sedation, and potential complications such as prolonged ventilation and adverse clinical outcomes (delirium, cognitive dysfunction, etc.)
  - Treat pain first; start sedation only if clearly indicated (anxiety, paralytic use, etc.)
- Perform daily spontaneous awakening trials and SBTs, and use protocols for both sedation withdrawal and SBTs
  - Consider all clinicians’ schedules when scheduling these trials to ensure they are performed

Resources:
- Tools and Tactics
- SAS and RASS sedation assessment tools
- BPS and CPOT pain assessment scales
- Nurse-driven Pain and Sedation Protocol
- Wake Up and Breathe Protocol
- Early Progressive Mobility Protocol
- AACN Practice Alert: Assessing Pain in the Critically Ill Adult
- Webinar Series Learn Network discussion forum

Proactively Preventing Ventilator-associated Events (VAE) Copyright © 2014 American Association of Critical-Care Nurses
• Be curious
• Look beyond the bundle
• Engage bedside staff in an evaluation
• Use findings to generate improvement
QUESTIONS OR THOUGHTS?
Thank you!
mwhitney@cynosurehealth.org
BRING IT HOME

Marina Levin, Program Manager, HRET | 12:15–12:20
HOSPITAL LEADERS ACTION ITEMS

What are you going to do by next Tuesday?

☐ Meet with ICU leaders, infection preventionist and respiratory therapy leadership to discuss goal date for VAE data submission to NHSN.

☐ Ask of your ICU leadership what you can do to support PDSA cycles of testing and implementing VAE surveillance and data submission.

What are you going to do within the next month?

☐ Check on progress of VAE surveillance – has goal been met?

☐ Help determine and remove barriers.
UNIT LEADERS ACTION ITEMS

What are you going to do by next Tuesday?
 ICU and respiratory therapy leadership recruit staff champions.
 Work with infection preventionist and staff champions to start the PDSA of VAE surveillance process.
 Use the VAE calculator for the next round of surveillance.

What are you going to do within the next month?
 Conduct PDSA and implement VAE surveillance.
 Determine how you can use the data to assist in VAE prevention efforts.
 Conduct a bedside debriefing after the next IVAC or VAP is identified to promote learning.
PHYSICIAN LEADER ACTION ITEMS

What are you going to do by next Tuesday?

- Promote multidisciplinary rounds daily and timely extubation and mobility.
- Review VAE data and support the need for daily surveillance.

What are you going to do in the next month?

- Participate in bedside debriefing for next VAE.
- Partner with unit leaders on process for bedside debriefing for VAE and incorporation of learnings in to prevention efforts.
UNIT-BASED TEAM ACTION ITEMS

What are you going to do by next Tuesday?
- Participate in VAE surveillance.
- Review and modify multidisciplinary round report to ensure VAE prevention measures are included.

What are you going to do in the next month?
- Support and participate in bedside debriefings for VAE.
- Perform just in time training with peers regarding breaches in VAP bundle and additional VAE prevention measures.
What are you going to do by next Tuesday?

- Confer with VAE champions how best to support VAE prevention efforts.
- Explore patient and family education for mechanical ventilation.

What are you going to do in the next month?

- Participate in bedside debriefing for VAC.
- Work with ICU team to coordinate family participation in multidisciplinary rounds.
QUESTIONS?
THANK YOU!

Find more information on our website: www.hret-hen.org

Questions/Comments: hen@aha.org