

Partnership for Patients



ALASKA STATE HOSPITAL &
NURSING HOME ASSOCIATION



Washington State
Hospital Association

Safety Action Bundle – Ventilator Associated Events (VAE)

Background

- Mechanical ventilation is an essential, life-saving therapy for more than 300,000 patients in the U.S. each yearⁱ. However, because of being mechanically ventilated, these patients are at high risk for complications and poor outcomes, including death. Complications lead to longer duration of mechanical ventilation, longer stays in the ICU and hospital, increased healthcare costs, and increased risk of death and disability.
- Surveillance of ventilator-associated events (VAE) prior to 2013 was limited to ventilator-associated pneumonia (VAP); however, VAP criteria and definitions are not sensitive or specific so its use in public reporting and inter-facility comparisons is limitedⁱ.
- The current surveillance criteria identify a broad range of conditions and complications that occur in mechanically-ventilated adults. These serve to identify events that are clinically important and may be preventable and include: Ventilator-Associated Condition (VAC), Infection-related Ventilator-Associated Complication (IVAC), and Possible VAP (PVAP)ⁱⁱ. Most VACs are due to pneumonia, Acute Respiratory Distress Syndrome (ARDS), atelectasis, and pulmonary edemaⁱⁱⁱ. Approximately 5-10% of mechanically ventilated patients develop VAEs^{iv}.
- 5-15% of ventilated patients still develop nosocomial pneumonias^{iv}. In addition, the mortality rate attributed to VAP is approximately 10%^{iv}.
- Hospitals are encouraged to focus on interventions, or a ventilator bundle, that have been proven to decrease the occurrence of VAE and associated mortality, length of stay and cost.



Aims

To reduce the incidence of VAE by 20% by September 27, 2018.

**Hospitals already at goal should focus on maintenance and hardwiring.*

Measures

Outcome: Infection-Related Ventilator Associated Condition (IVAC)^v per Centers for Medicare and Medicaid (CMS) and National Healthcare Safety Network (NHSN)

Ventilator-Associated Condition (VAC) per CMS and NHSN^v

Submit: National Healthcare Safety Network (NHSN)

Core Strategies

Strategy	Description
Culture/ Patient and Family Engagement	<ul style="list-style-type: none"> <input type="checkbox"/> Encourage and support patient and family participation in care planning and decision making by using tools like the “Prevent Pneumonia” checklist offered by Campaign Zero^{vi}. <input type="checkbox"/> Educate patient and family on the ventilator bundle and how they can participate in VAE prevention. <input type="checkbox"/> Promote a blame-free environment where individuals are able to report errors or near misses without fear of reprimand or punishment. <input type="checkbox"/> When an event occurs, interview staff, patient and family about ways this might have been prevented. <input type="checkbox"/> Encourage collaboration across ranks and disciplines to seek solutions to patient safety problems. <input type="checkbox"/> Promote transparency of VAE by displaying rates on units, to the board and to the public.
Leadership	<ul style="list-style-type: none"> <input type="checkbox"/> Set aims, goals and timelines for practice changes. <input type="checkbox"/> Identify executive sponsors and clinicians to champion the evidence based practices for VAE prevention. <input type="checkbox"/> Include key stakeholders on a multidisciplinary team for the development of protocols, work-flows and peer education. <input type="checkbox"/> Educate healthcare personnel who care for patients undergoing ventilation about proven methods for reducing the risk and incidence of VAE. <input type="checkbox"/> Educate clinicians who care for patients undergoing ventilation about noninvasive ventilation strategies. <input type="checkbox"/> Identify and address barriers to compliance with ventilator bundle.
Surveillance	<ul style="list-style-type: none"> <input type="checkbox"/> Conduct active surveillance for VAE, using CDC definitions and surveillance protocols for VAC, IVAC, possible VAP and probable VAP. <input type="checkbox"/> Perform direct observation of compliance with VAE-specific process measures. Use structured observation tools at regularly scheduled intervals such as during multidisciplinary rounding. <input type="checkbox"/> Maximize the use of EHR technology to automate VAE detection.
Prevent Aspiration	<ul style="list-style-type: none"> <input type="checkbox"/> Avoid gastric over-distention by avoiding bolus tube feedings, reassessing feeding tube placement at regular intervals, and/or utilizing a small bore nasogastric tube for gastric decompression. <input type="checkbox"/> Avoid unplanned extubation and reintubation by using appropriate securement techniques, frequent patient assessments, and use of physical restraints or sedation as appropriate. <input type="checkbox"/> HOB should be elevated 30-45 degrees unless medically contraindicated. Develop visual cues to support compliance. <input type="checkbox"/> Use a cuffed endotracheal tube with in-line or subglottic suctioning. Ensure adequate cuff inflation to prevent saliva from entering the trachea.

Strategy	Description
Prevent Colonization of the Aero-digestive Tract	<ul style="list-style-type: none"> □ Provide easy access to noninvasive ventilation equipment and institute protocols to promote the use of noninvasive ventilation. □ Adhere to hand hygiene guidelines. □ Oro-tracheal intubation is preferred to naso-tracheal intubation. □ Perform regular oral care with an antiseptic solution, brush teeth, and perform oral and pharyngeal suctioning. Utilize visual cues and family engagement strategies to ensure compliance. □ Keep Yankauer suction holster off floor and bed to prevent contamination. □ Enlist pharmacy in appropriate peptic ulcer disease prophylaxis if deemed necessary. Routine stress ulcer prophylaxis does not decrease VAP but is effective in reducing the risk of GI bleeding.
Sedation Vacation	<ul style="list-style-type: none"> □ Spontaneous Awakening Trials (SAT) and Spontaneous Breathing Trials (SBT): Implement a protocol for daily sedation interruption or a light target level of sedation for assessment of readiness for extubation. Include precautions to prevent self-extubation during testing such as increased monitoring during the trial. □ Discuss results of SAT/SBT during multidisciplinary rounds and in nurse-to-nurse hand offs.
Prevent Venous Thrombo-embolism	<ul style="list-style-type: none"> □ Institute appropriate mechanical or pharmacological venous thromboembolism (VTE) prophylaxis. □ Utilize VTE and bleeding risk assessments and electronic clinical decision support to facilitate compliance with hospital standards.
ABCDEF Bundle	<ul style="list-style-type: none"> □ Implement all components of the ABCDEF bundle^{vii}. The bundle improves the health of ventilated patients by reducing their risk of over-sedation, reducing patient immobility, increasing patient comfort, reducing the risk of infection, and decreasing the risk of mental status changes and long term morbidity^{viii}.
Minimize Contamination of Respiratory Equipment	<ul style="list-style-type: none"> □ Use sterile water to rinse reusable respiratory equipment. □ Remove condensate from ventilator circuits. Keep the ventilator circuit closed during condensate removal. □ Change the ventilator circuit only when visibly soiled or malfunctioning.
Performance and Variation	<ul style="list-style-type: none"> □ Present your performance compared to others to the board and other key stakeholder groups. □ Establish an audit process to ensure adherence to bundle elements.

Moving Towards Zero

Strategy	Description
Moving Towards Zero	<ul style="list-style-type: none"> □ Perform VAP risk assessment. Employ additional interventions for locations or populations with unacceptably high VAP rates. □ Create a team approach where respiratory therapists and nursing work collaboratively to maintain HOB elevation, provide consistent oral care and complete sedation vacation. □ Embed standardized order sets and pop-up reminders in your EHR to support evidence based practice. □ Consider incorporating ventilator bundle orders as default orders requiring an opt-out for patients for whom the bundle elements are contraindicated.

Developed by the Washington State Hospital Association's Partnership for Patients.

For more information, questions, or assistance contact Partnership@wsha.org or visit our website at <http://wsha.org/quality-safety/partnership-for-patients/>.

Key Resources

- Barr, J., Fraser, G.L., Puntillo, K., Ely, E.W., Gelinas, C., Dasta, J.F., ... Jaeschke, R. (2013). Clinical Practice Guidelines for the Management of Pain, Agitation, and Delirium in Adult Patients in the Intensive Care Unit. *Critical Care Medicine*. 41(1): 263- 306. DOI: 10.1097/CCM.0b013e3182783b72
- Guidelines. (n.d.) ICU Liberation. Retrieved from <http://www.iculiberation.org/Guidelines/Pages/default.aspx>
- Health Research & Educational Trust (February 2016). Ventilator Associated Events (VAE) Change Package: 2016 Update. Chicago, IL: Health Research & Educational Trust. Accessed at www.hret-hen.org
- Munro, N. & Ruggiero, M. (2014). Ventilator-Associated Pneumonia Bundle: Reconstruction for Best Care. *AACN Advanced Critical Care*, 25(2), 163-175. DOI: 10.1097/NCI.0000000000000019
- Ventilator-Associated Event (VAE): Change Package. (2016). Health Research & Educational Trust. Retrieved from http://www.hret-hen.org/topics/vae/HRETHEN_ChangePackage_VAE.pdf

ⁱ Ventilator-Associated Event (VAE). (2016) Centers for Disease Control and Prevention. Retrieved from http://www.cdc.gov/nhsn/pdfs/pscmanual/10-vae_final.pdf

ⁱⁱ Surveillance for Ventilator-associated Events. (2016). Centers for Disease Control and Prevention. Retrieved from <http://www.cdc.gov/nhsn/acute-care-hospital/vae/index.html>

ⁱⁱⁱ Klompas, M., Khan, Y., Kleinman, K., Evans, R.S., Lloyd, J.F. Stevenson, K., ... Platt, R. (2011) Multicenter Evaluation of a Novel Surveillance Paradigm for Complications of Mechanical Ventilation. *PLOS ONE* 6(3). doi:10.1371/journal.pone.0018062.

^{iv} Klompas, M., Branson, R., Eichenwald, E.C., Greene, L.R., Howell, M.D., Lee, G., ... Berenholtz, S.M. (2014). Strategies to Prevent Ventilator-Associated Pneumonia in Acute Care Hospitals: 2014 Update. *Infection Control and Hospital Epidemiology*, 35(8):915-936. DOI: 10.1086/677144.

^v https://www.cdc.gov/nhsn/pdfs/pscmanual/10-vae_final.pdf

vi <http://www.campaignzero.org/patient-safety-checklists/prevent-pneumonia/>

vii http://www.icudelirium.org/docs/ABCDEF_Bedside_Checklist.pdf

viii Delirium Prevention and Safety: Starting with the ABCDEF's. (n.d.) Vanderbilt University Medical Center. Retrieved from <http://www.icudelirium.org/medicalprofessionals.html>