The ABCs of VAE

Reducing Ventilator-Associated Events

June 24, 2015

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VAE Objectives

- Define ventilator-associated events (VAE)
- Describe the components of the ventilator bundle
- Identify at least one evidence-based component of VAE prevention to implement at your facility

VAE Algorithm

- Patient on mechanical ventilation > 2 days
- Baseline period of stability or improvement, followed by sustained period of worsening oxygenation
- Ventilator-Associated Condition (VAC)
- General, objective evidence of infection/inflammation
- Infection-Related Ventilator-Associated Complication (IVAC)
- Positive results of laboratory/microbiological testing
- Possible or Probable VAP

VAE Components

- Ventilator-associated condition (VAC)
  - Hypoxemia for two days
  - No consideration for cause of hypoxemia
- Infection-related ventilator-associated complication (IVAC)
  - Hypoxemia with generalized infection or inflammation
  - Antibiotics are instituted for at least four days
- Probable or possible ventilator-associated pneumonia (VAP)
  - Sputum gram stain with WBC or pathogen identification
  - Culture of respiratory pathogen with IVAC

Evidence-Based Practices

- ABCDE Bundle
  - ABC: **A**wakening and **B**reathing Trial **C**oordination
    - A: Spontaneous Awakening trials (SAT)
    - B: Spontaneous Breathing trials (SBT)
    - C: RN and Respiratory Therapist Coordination to perform trials by reducing or stopping sedation so as to awaken the patient
  - D: **D**elirium Assessment and Management
  - E: **E**arly Exercise and Progressive Mobility
- Elevate the Head of the Bed (HOB)
- Peptic Ulcer Disease (PUD) Prophylaxis
- Venous Thromboembolism (VTE) Prophylaxis
- Oral Care

SAT/SBT Trials

- SAT Safety Screen
  - Excluded from SAT if:
  - Sedative infusion for active seizures or delirium tremens
  - Neuromuscular blockade
  - Active MI in previous 24 hours
  - Malignant intracranial hypertension (ICP > 20)
  - Hypothermia protocol
  - Terminal care
  - Intubated for airway protection
  - Provider orders to hold interruption
- Pass Safety Screen:
  - Interrupt sedation and proceed with SAT
  - If successful, proceed with SBT and weaning protocol
- Fail SAT:
  - Sustained anxiety or agitation
  - O2 sat < 90% for 5 min or longer
  - Acute dysrhythmia or change in vital signs
  - Signs of respiratory distress
- Next steps:
  - Restart sedation at half dose and titrate
  - Discuss plans at multidisciplinary rounds

A, B & C Change

- Order sets and checklists
- Coordinate between nursing and respiratory therapy to manage the SAT and SBT.
- Use whiteboards to enhance coordination.
- Provide a daily reduction in or removal of sedative support.
- Designate a time of day for the SAT and SBT to be attempted that will not disrupt patient rest. Determine how often SBTs have failed due to high levels of sedation.
- Discuss the results of a patient's SAT and SBT during daily multi-disciplinary rounds, nurse-to-nurse hand-offs, nurse-to-charge nurse reports, and charge nurse-to-charge nurse reports.
- Consider strategies to decrease benzodiazepine usage, such as:
  - Goal-directed sedation with titration of medications using sedation protocols and a sedation scale
  - Consider use of an alternative sedative to benzodiazepines (e.g. dexmedetomidine or propofol)

D & E Change

- Delirium
  - Titrate sedation using appropriate protocols
  - Encourage communication and reorient frequently
  - Ensure the white board is up-to-date
  - Open shades and keep lights on during the day
  - Close the shades, dim the lights, pull the curtain at night
  - Provide an uninterrupted rest period between 1 and 3 p.m.
  - Minimize use of physical restraints (including lines and tubes)
  - Minimize noise inside and outside of the room
  - At night, allow for minimum of two hours of uninterrupted sleep
- Early Exercise and Progressive Mobility
  - Remove "bedrest" from Order Set
  - Include early PT and OT consults

Elevate the Head of the Bed

- Engage staff nurses in collaborating and developing visual cues
- Examples of visual cues include:
  - Using a line (red tape) on the wall that can only be seen if the bed is below a 30-degree angle
  - Placing a red stripe on the bedframe at a 30-degree angle. At 30 degrees, the red stripe will be parallel to the floor
- Include HOB elevation into the standardized order set
- Identify one person to check for visual cues in each unit on each shift
- Collaborate with RT staff to observe for HOB elevation
- Engage patient and family in HOB elevation

PUD and VTE Prophylaxis

- Include PUD and VTE prophylaxis in ICU admission and ventilator order sets
- Allow physicians to "opt-out" with documentation of the rationale
- Engage pharmacists to ensure patients have been given appropriate prophylaxis
- Have pharmacists produce "opt-out" reports
- Proton-pump inhibitors (PPI) and H2 blockers are preferred for PUD prophylaxis
- Pharmacologic VTE prophylaxis is preferred over mechanical
- If mechanical VTE prophylaxis is ordered, assess to ensure it is functioning

Oral Care

- Incorporate oral care in order sets
- Brush teeth twice a day in all ventilated patients
- Routine oral care (at least q 2-4°) with an antiseptic mouthwash swab
- Chlorhexidine 0.12% mouthwash at least daily for all ventilated patients
- Create visual cues to demonstrate compliance with oral care
- Keep an adequate supply of oral care products accessible at the bedside
- Engage Respiratory Therapy in the performance of oral care also
- Utilize subglottic suction in a closed system
- Use tonsil tip suction to remove excessive secretions as necessary

Readiness Assessment

Communication and Collaboration	A	B	C
Every team member on our unit embraces true collaboration as an ongoing process and invests in its development to ensure a sustained culture of collaboration.			
Every team member contributes to the achievement of common unit goals.			
All team members are informed and knowledgeable about patient outcomes and performance improvement data for our unit.			
SAT, SBT and Sedation			
Our unit has a sedation and analgesia protocol in place.			
We routinely perform both a pain and sedation assessment on patients using a validated tool.			
We currently perform SATs, (aka "sedation vacations") daily on all patients receiving sedation.			
We have a standardized protocol for performing SATs.			
Delirium Assessment and Management			
All patients are assessed daily for the presence of delirium.			
We use a validated tool to assess for the presence of delirium.			
Our unit has a standardized delirium management protocol.			
Delirium monitoring is included in our daily rounds for ALL patients.			
Early Exercise and Progressive Mobility			
Our unit has a protocol for early exercise and progressive mobility for ALL patients.			
Immobile patients on our unit receive passive range of motion regularly, if tolerated.			
Our unit has the necessary support equipment to safely assist with increased mobility.			
Respiratory therapists and physical therapists are available to assist with implementing early exercise and progressive mobility protocols.			
Mobility is addressed during daily rounds.			

A = Yes/Always B = Occasionally/Sometimes C = No/Never
Adapted from AACN

Model For Improvement

- Testing SAT/SBT protocols
- Step One: Plan
  - Do not reinvent the wheel. Use a protocol that has been successful at another hospital and adapt it
  - Test one step at a time.
  - Do not plan to implement all of the ABCDE recommendations at once.
  - Concentrate first on the ABC, and then add the D and E.
- Step Two: Do
  - Identify an early-adopter physician to trial these changes with his/her next few ventilator patients.
  - Ask a receptive nurse and respiratory therapist to trial the protocols as well.
  - Test "small": One physician, one nurse, one therapist, one patient
- Step Three: Study
  - Debrief as soon as possible after the test with those involved, asking:
  - What happened? What went well? What didn't go well? What do we need to revise?
- Step Four: Act
  - Do not wait for the next committee meeting to make changes.
  - Revise and re-test the revisions with the same physician, nurse, and therapist.
- When successful - SPREAD

Comprehensive Resource

AHA/HRET Ventilator Associated Events Change Package – 2014 Update

http://www.qualityinsights-qin.org/Resources.aspx

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This material was prepared by Quality Insights, the Medicare Quality Innovation Network-Quality Improvement Organization for West Virginia, Pennsylvania, Delaware, New Jersey and Louisiana under contract with the Centers for Medicare & Medicaid Services (CMS), an agency of the U.S. Department of Health and Human Services. The contents presented do not necessarily reflect CMS policy. Publication number QI-C1-062215