


## VAE Surveillance Data Validation Tool

### PART I : VAE Surveillance Process (Ventilator Associated Events)

#	Items	Staff Knowledge: (ICPs responsible for VAE Surveillance must be well trained about VAE Surveillance Protocols) Ask staff about process of VAE Surveillance and review all required data / documents.	Score	Comments
WHAT?	CDC - NHSN VAE Criteria	<p>Assess if ICPs assigned for VAE surveillance are well familiarized with VAE case definitions / tiers as per CDC-NHSN criteria &amp; fully understand VAE surveillance process.</p> <p>Numerator: VAC → IVAC → PVAP  <b>VAC : Deterioration in respiratory status after a period of stability or improvement on the ventilator</b> (PEEP &amp; FIO<sub>2</sub>)  <b>IVAC : Evidence of infection or inflammation</b> (Temp: &gt; 38°C or &lt; 36°C WBC Count: ≥ 12,000 or ≤ 4,000 ,4 consecutive Qualifying Antimicrobial Day (QAD))  <b>PVAP: Laboratory evidence of respiratory infection.</b> (Positive respiratory specimen &amp; Purulent respiratory secretions as per criteria I,II &amp; III)</p> <p>Demonimator/s:  <b>Patient Days:</b> Number of patients housed in a facility inpatient location during the designated counting time each day and summed for a monthly denominator report.  <b>Ventilator days:</b> Numbers of patients managed with ventilatory devices, are collected daily, at the same time each day, according to the chosen location using the appropriate form.</p>		
WHERE?	VAE Surveillance Location	<p>Ask where VAE surveillance should be conducted for adult patients??  <b>Adult VAE Surveillance</b> is conducted in all Adult Critical Care Units where denominator data can be collected - Patient days &amp; Ventilator days</p> <p>Adult VAE = Adult Critical Care locations          Ped VAE = PICU &amp; NICU          (NOTE: Currently only critical care units are included in HAI surveillance data reporting via electronic platforms)</p>		
WHO?	Targeted Patients	<p>Ask about targeted patients for VAE surveillance??  <b>Any patient admitted in Adult ICU who is on ventilator / Intubated is candidate for VAE Surveillance.</b></p> <p><b>Inclusion Criteria: Patients INCLUDED in VAE surveillance:</b>  <b>Patients on a ventilator who are receiving:</b>          1: Conventional mode of mechanical ventilation          2: Airway Pressure Release Ventilation (APRV) or related modes  <b>Ventilator:</b> A 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 oral/nasal endotracheal or tracheostomy tube</p> <p><b>Exclusion Criteria: Patients EXCLUDED from VAE surveillance:</b>          1: All patients in the neonatal and pediatric inpatient locations          2: Patients on high-frequency ventilation, extracorporeal life support etc          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 facemask, total mask, etc.) are NOT considered ventilators</p>		
HOW?	VAE Surveillance Data Collection	<p>Ask how VAE Surveillance data is collected?          ICPs must conduct active VAE surveillance using the updated Adult VAE Monitoring form for all adult critical care units included in Seha Platform.          Review if VAE monitoring forms are available with complete information. (Review at least 20 patients on ventilator in the specified surveillance period)          VAE monitoring Form &amp; Ventilator Care bundle MUST be initiated for every ventilated patients as per inclusion criteria.</p>		

HOW?	Data Source for VAE <b>VAC</b>	<p>VAC Parameters data source : Ventilator settings, RT Notes, Patient Files</p> <p><b>PEEP:</b> Positive End-Expiratory Pressure = sustained increase in the daily minimum PEEP of <math>\geq 3</math> cmH<sub>2</sub>O following a period of stability or improvement on the ventilator is one of the two criteria that can be used in meeting the VAC definition.</p> <p><b>AND/OR</b></p> <p><b>FiO<sub>2</sub>:</b> Fraction of Inspired Oxygen = sustained increase in the daily minimum FiO<sub>2</sub> of <math>\geq 0.20</math> (20 points) following a period of stability or improvement on the ventilator is one of the two criteria that can be used in meeting the VAC definition.</p> <p><i>(Lowest value of PEEP during a calendar day that is set on the ventilator and maintained for &gt; 1 hour must be recorded in VAE monitoring form. Record Daily minimum PEEP and FiO<sub>2</sub> value .</i></p>		
HOW?	Data Source for VAE <b>IVAC</b>	<p>IVAC parameters data source : Patient Files, Doctors Notes, Nurses Notes</p> <p><b>Temp:</b> &gt; 38 °C or &lt; 36 °</p> <p><b>WBC Count:</b> <math>\geq 12,000</math> or <math>\leq 4,000</math></p> <p><b>Qualifying Antimicrobial Day (QAD):</b> A day on which the patient was administered an antimicrobial agent determined to be “new” within the VAE Window Period. <u>Four consecutive QADs</u> are needed to meet the IVAC antimicrobial criterion—starting within the VAE Window Period.</p>		
HOW?	Data Source for VAE <b>PVAP</b>	<p>PVAP data source : Lab Results</p> <p><b>Criteria-I</b> 1: Positive culture: meeting specific quantitative or semi-quantitative threshold</p> <p><b>Criteria - II</b> Purulent respiratory secretions <b>AND</b> identification of organisms NOT meeting the quantitative or semi-quantitative thresholds specified for criteria 1 <i>Purulent Respiratory Secretions: Defined as secretions from the lungs, bronchi, or trachea that contain <math>\geq 25</math> neutrophils and <math>\leq 10</math> squamous epithelial cells per low power field [lpf, x100].</i></p> <p><b>Criteria III: (One of following)</b> a) Organisms identified from pleural fluid specimen <i>(where specimen was obtained during thoracentesis or within 24 hours of chest tube placement)</i> b) Positive lung histopathology c) Lower respiratory specimen cytology findings suggestive of infection d) Positive diagnostic test for Legionella species or selected respiratory viruses</p>		
WHERE?	Ped VAE Surveillance Location	<p><u>Ask where Ped VAE surveillance should be conducted?</u></p> <p>Ped VAE Surveillance is conducted in all Pediatric &amp; Neonatal ICUs where denominator data can be collected (Patient days &amp; Ventilator days)</p>		
WHO?	Targeted Patients	<p>Any patient admitted in Pediatric ICU (PICU) &amp; Neonatal ICU (NICU) who is on ventilator / Intubated is under VAE Surveillance. Ped VAE monitoring Form is initiated &amp; Pediatric Care bundle is applied.</p> <p><b>Inclusion Criteria: Patients INCLUDED in Ped VAE surveillance:</b> Patients on a ventilator who are receiving: 1: Conventional mode of mechanical ventilation 2: high-frequency oscillatory or jet ventilation</p> <p><b>Exclusion Criteria: Patients EXCLUDED from Ped VAE surveillance:</b> 1: All patients in the adult inpatient locations 2: Patients on extracorporeal life support or paracorporeal membrane oxygenation during periods of time when the support is in place for the full calendar day.</p>		
HOW?	Ped VAE Surveillance Data Collection	<p>ICPs are conducting active surveillance using the updated <u>Pediatric VAE Monitoring form</u> for Pediatric ICUs (PICU) &amp; Neonatal ICUs (NICU) <i>(Patient files, RT notes etc)</i> <i>Review if VAE monitoring form is available with complete information. (Review at least 20 patients on ventilator in the specified surveillance period)</i> <i>VAE monitoring Form &amp; Ventilator Care bundle MUST be initiated for every ventilated patients as per inclusion criteria.</i></p> <p><b>Ped VAE :</b> <b>Mean Airway Pressure (MAP):</b> The average pressure exerted on the airway and lungs from the beginning of inspiration until the beginning of the next inspiration. Sustained increase in the daily minimum MAP of <math>\geq 4</math> cmH<sub>2</sub>O following a period of stability or improvement on the ventilator is one of two criteria that can be used in meeting the PedVAE definition.</p> <p><b>Fraction of Inspired Oxygen (FiO<sub>2</sub>):</b> The fraction of oxygen in inspired gas Sustained increase in the daily minimum FiO<sub>2</sub> of <math>\geq 0.25</math> (25 points) following a period of stability or improvement on the ventilator is one of the two criteria that can be used in meeting the PedVAE definition.</p>		

B: Positive Culture Linelist & Internal Validation				
WHAT?	Line list Review	Is there any effective notification system between the IPC department, laboratory, and all departments in the hospital for any critical values (i.e MDROs, positive cultures & high-alert microorganisms).		
		Is there any updated linelist/logbook of all positive microbiological cultures that includes Patient information, Date of admission to hospital & unit, date of device insertion date of device removal , date of specimen collection, type of organism, sings & symptoms etc		
		Internal validation done to review data for candidate Ventilator Associated Event (VAC,IVAC.PVAP)		
		Internal validation done to review denominator data.		
		Possibility of Outbreak ruled out - No epidemiological link between cases reported from same location in same time frame		
C: VAE Events Idetification & Reporting				
WHAT?	Data Analysis & Event reporting	Number of VAE Events correctly identified as per CDC-NHSN Criteria		
		Number of VAE events matching CDC criteria that were missed by ICP and were detected during visit.		
		Number of correctly idetified VAE Events reported Via seha platform in a timely mannner.		
		Number of VAE events as per manual sheet are 100% matching with Seha Platform & Power BI dashboard		
D: VAE Surveillance Data Entry Via Seha Platform				
WHAT?	Electronic Platforms	All patients admitted in critical care units are registered in Seha Platform with or without devices.		
		Ventilator Device information is entered accurately for all ventilated patients and required ventilator bundle form is filled.		
		Number of patients currently admitted in Adult ICUs, PICUs & NICUs is 100% matching with Seha platform on day of visit.		
E: HAI Outbreak Detection & Reporting (ESCAPE-C)				
WHAT?	Outbreak Detetction Reporting	Outbreak was detected correctly as per latest GDIPC updates (version 7.2 Jan 2025)		
		Outbreak was reported in a timely manner via electronic Platform		
		An outbreak was missed which was detetced during visit as per linelist ( <i>Device associated (Ventilator) or non device associated</i> )		
<div> F: National VAE Prevention Strategy Implementation (NVRS)</div>				
WHAT?	NVRS Tools (Knowledge & Practices)	Assess staff knowledge about Natioanal VAE Reduction Strategy. (NVRS)		
		Ask about the NVRS prevention tools & their implementation (Adult & Ped VAE Location)		
		Compare the actual compliance data Vs data submitted each month - observe any discrepancy.		
PART II : On Site Visit - Validation Rounds (Adult ICU, PICU, NICU)				
WHAT?	IC Rounds	Conduct rounds in adult ICU, PICU & NICU & ensure care bundles & prevention tools are applied.		
		Assess staff knowledge about ventilator bundles & NVRS prevention tools.		
PART III (Education & Training Session)				
WHAT?	VAE Surveillance Education & Training	External Validator conducted short concluding training & education session??		
		Adult VAE Surveillance Protocols Pediatric VAE Surveillance Protocols Adult Ventilator bunlde Pediatric Ventilator Bundle NVRS Tools overview		
WHO?		Targeted Audience: Infection Control Team Nursing representatives / staff from Adult ICUs, PICUs, NICUs		