

Hospital Events: Ventilator-Associated Pneumonia (VAP) and Pneumonia

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PTSF

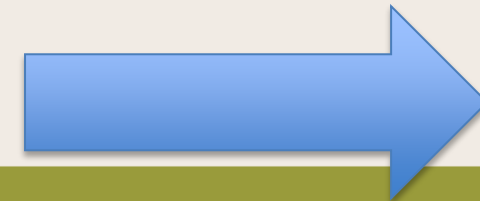
Recording Hospital Event: VAP

- The first rule to recording VAP:
- A diagnosis of “Pneumonia” must be written somewhere in the chart.



VAP: A diagnosis of pneumonia must be documented in the patient's medical record.

Found Pneumonia? Keep going



Recording Hospital Event: VAP

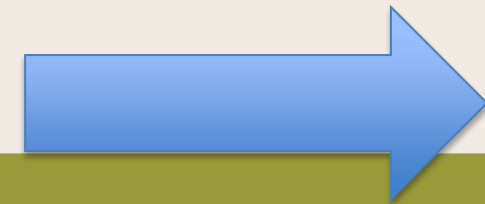
- The second rule to recording VAP:
- Must have occurred during the patient's initial stay at your hospital.

Note: Infections occurring in newborns with date of event on hospital day 1 or day 2 are considered POA. Those with date of event on day 3 or later are HAI



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Occurred after arrival? Keep going

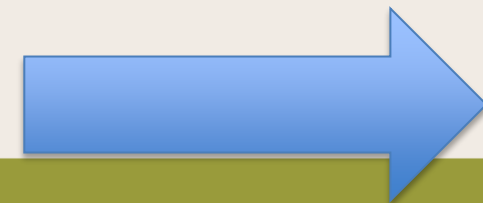


Recording Hospital Event: VAP

- **Next step:**
- Patient has diagnosed pneumonia;
- Was the patient on mechanical ventilation for > 2 calendar days on the date of event, (with day of ventilator placement being Day 1)
AND
- Was the ventilator in place on the date of event or the day before?



Yes, Yes, and Yes? Keep going



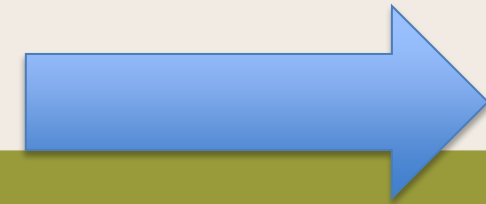
Recording Hospital Event: VAP

- Patient has diagnosed pneumonia AND
- Patient was mechanically ventilated > 2 days, with ventilator in place on date of event or day before
- **Look for imaging!**
- Two or more serial chest imaging test results with at least **one** of the following:
 - New or progressive and persistent infiltrate
 - Consolidation
 - Cavitation
 - Pneumatoceles in infants \leq 1 year old



*NOTE: In patients **without** underlying pulmonary or cardiac disease (e.g., respiratory distress syndrome, bronchopulmonary dysplasia, pulmonary edema, or chronic obstructive pulmonary disease), **one definitive** chest imaging test result is acceptable*

Yes, Yes, and Yes? Keep going



Recording Hospital Event: VAP

PNU2 Bacterial or Filamentous Fungal Pathogens: PNU2 Viral, Legionella, and other Bacterial Pneumonias:

- Patient has diagnosed pneumonia AND
- Patient meets mechanical ventilation criteria
- AND Patient meets imaging criteria
- **Look for signs and symptoms!**

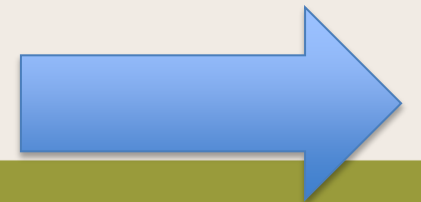
At least one:

- Fever ($>38^{\circ}\text{C}$ or $>100.4^{\circ}\text{F}$)
- Leukopenia (<4000 WBC/ mm^3) or leukocytosis ($\geq 12,000$ WBC/ mm^3)
- For adults ≥ 70 years old, altered mental status with no other recognized cause

AND at least one:

- New onset of purulent sputum, or change in character of sputum, or increased respiratory secretions, or increased suctioning requirements
- New onset or worsening cough, or dyspnea, or tachypnea
- Rales or bronchial breath sounds
- Worsening gas exchange (e.g., O_2 desaturations (e.g., $\text{PaO}_2/\text{FiO}_2 \leq 240$), increased oxygen requirements, or increased ventilator demand)

Yes and Yes? Keep going



Recording Hospital Event: VAP

Patient has diagnosed pneumonia
AND
Patient meets mechanical ventilation criteria
AND
Patient meets imaging criteria
AND
Patient meets signs/symptoms criteria

Where's the lab?

Which is it you are looking for?

- *PNU2 Bacterial or Filamentous Fungal Pathogens*
- *PNU2 Viral, Legionella, and other Bacterial Pneumonias*
- *PNU3 Immunocompromised Patients*
- *ALTERNATE CRITERIA (PNU1), for infant's ≤ 1 year old*
- *ALTERNATE CRITERIA (PNU1), for children > 1 year old or ≤ 12 years old*

Note: Identification of organisms from specimens collected during post-mortem examination (autopsy) are only eligible for use in meeting ... the PNEU infection definition using lung tissue specimen obtained by transthoracic or transbronchial biopsy immediately post-mortem.



Recording Hospital Event: VAP

PNU2 Bacterial or Filamentous Fungal Pathogens

At least one:

- Organism identified from blood
- Organism identified from pleural fluid
- Positive quantitative culture from minimally-contaminated LRT specimen (e.g., BAL or protected specimen brushing.)
- $\geq 5\%$ BAL-obtained cells contain intracellular bacteria on direct microscopic exam (e.g., Gram's stain)
- Positive quantitative culture of lung tissue
- Histopathologic exam shows at least **one** of the following evidences of pneumonia:
 - Abscess formation or foci of consolidation with intense PMN with Accumulation in bronchioles and alveoli
 - Evidence of lung parenchyma invasion by fungal hyphae or pseudohyphae

Found one in documentation? Record VAP

Recording Hospital Event: VAP

PNU2 Viral, Legionella, and other Bacterial Pneumonias

At least one:

- *Virus, Bordetella, Legionella, Chlamydia or Mycoplasma* identified from respiratory secretions or tissue by a culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis or treatment (e.g., not Active Surveillance Culture/Testing (ASC/AST)).
- Fourfold rise in paired sera (IgG) for pathogen (e.g., influenza viruses, *Chlamydia*)
- Fourfold rise in *Legionella pneumophila* serogroup 1 antibody titer to $\geq 1:128$ in paired acute and convalescent sera by indirect IFA.
- Detection of *L. pneumophila* serogroup 1 antigens in urine by RIA or EIA

Found one in documentation? Record VAP

Recording Hospital Event: VAP

PNU3 Immunocompromised Patients:

Patient has diagnosed pneumonia

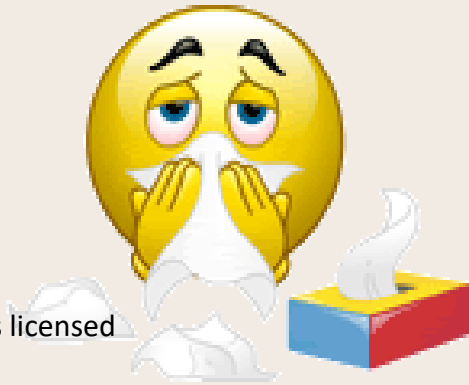
AND

Patient meets mechanical ventilation criteria

AND

Patient meets imaging criteria

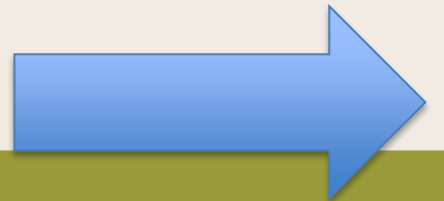
Look for signs and symptoms!



At least one:

- Fever ($>38^{\circ}\text{C}$ or $>100.4^{\circ}\text{F}$)
- For adults ≥ 70 years old, altered mental status with no other recognized cause
- New onset of purulent sputum, or change in character of sputum, or increased respiratory secretions, or increased suctioning requirements
- New onset or worsening cough, or dyspnea, or tachypnea
- Rales or bronchial breath sounds
- Worsening gas exchange (e.g., O_2 desaturations (e.g., $\text{PaO}_2/\text{FiO}_2 \leq 240$), increased oxygen requirements, or increased ventilator demand)
- Hemoptysis
- Pleuritic chest pain

Found one in documentation? Keep going

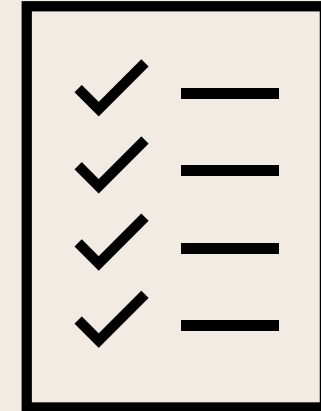


Recording Hospital Event: VAP

PNU3 Immunocompromised Patients:

At least one:

- Identification of matching *Candida* spp. from blood and sputum, endotracheal aspirate, BAL or protected specimen brushing.^{11,12,13}
- Evidence of fungi from minimally contaminated LRT specimen (e.g., BAL or protected specimen brushing) from one of the following:
 - Direct microscopic exam
 - Positive culture of fungi
 - Non-culture diagnostic laboratory test
- Any one:
 - Laboratory criteria defined under PNU2



Found one in documentation? Record VAP

Recording Hospital Event: VAP

ALTERNATE CRITERIA (PNU1), for infant's ≤1 year old:

Patient has diagnosed pneumonia

AND

Patient meets mechanical ventilation criteria

AND

Patient meets imaging criteria

Look for signs/symptoms and lab!



Must have: Worsening gas exchange (e.g., O₂ desaturation [e.g. pulse oximetry <94%], increased oxygen requirements, or increased ventilator demand)

AND at least three:

- Temperature instability
- Leukopenia (<4000 WBC/mm³) **or** leukocytosis (≥15,000 WBC/mm³) and left shift (≥10% band forms)
- New onset of purulent sputum, or change in character or sputum, or increased respiratory secretions, or increased suctioning requirements
- Apnea, tachypnea, nasal flaring with retraction of chest wall, or nasal flaring with grunting
- Wheezing, rales, or rhonchi
- Cough
- Bradycardia (<100 beats/min) or tachycardia (>170 beats/min)

Found in documentation? Record VAP

Recording Hospital Event: VAP

ALTERNATE CRITERIA (PNU1), for children >1 year old or ≤12 years old:

Patient has diagnosed pneumonia

AND

Patient meets mechanical ventilation criteria

AND

Patient meets imaging criteria

Look for signs/symptoms and lab!



At least three:

- Fever ($>38.0^{\circ}\text{C}$ or $>100.4^{\circ}\text{F}$) or hypothermia ($<36.0^{\circ}\text{C}$ or $<96.8^{\circ}\text{F}$)
- Leukopenia (<4000 WBC/ mm^3) or leukocytosis ($\geq 15,000$ WBC/ mm^3)
- New onset of purulent sputum, or change in character of sputum, or increased respiratory secretions, or increased suctioning requirements
- New onset or worsening cough, or dyspnea, apnea, or tachypnea
- Rales or bronchial breath sounds
- Worsening gas exchange (e.g., O_2 desaturations [e.g., pulse oximetry $<94\%$], increased oxygen requirements, or increased ventilator demand)

Found in documentation? Record VAP

Recording Hospital Event: Pneumonia

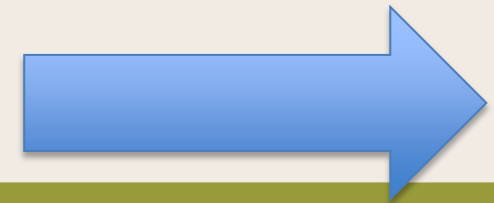
So what if it didn't meet VAP? It might meet Pneumonia

- **Pneumonia** - does not include VAP (ventilator-associated pneumonia)
- **Pneumonia** is defined as a patient with evidence of pneumonia that develops during the hospitalization without clinical evidence of inhalation injury.



Note: Must be documented in the patient record

.Documented in the record? Keep going



Recording Hospital Event: Pneumonia

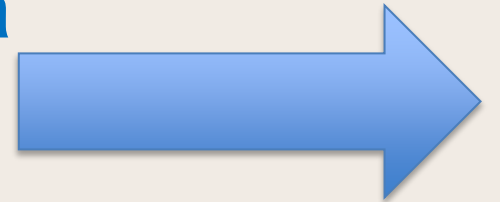
Patients with pneumonia must meet at least one of these:

Criterion 1. Rales or dullness to percussion on physical examination of chest

AND any of the following:

- a. New onset of purulent sputum or change in character of sputum
- b. Organism isolated from blood culture
- c. Isolation of pathogen from specimen obtained by transtracheal aspirate, bronchial brushing, or biopsy

Found one in documentation? Record Pneumonia
If not, keep going



Recording Hospital Event: Pneumonia

OR one of these:

Criterion 2. Chest radiographic examination shows new or progressive infiltrate, consolidation, Cavitation, or pleural effusion AND any of the following:

- a. New onset of purulent sputum or change in character or sputum
- b. Organism isolated from the blood
- c. Isolation of pathogen from specimen obtained by transtracheal aspirate, bronchial brushing, or biopsy
- d. Isolation of virus or detection of viral antigen in respiratory secretions
- e. Diagnostic single antibody titer (IgM) or fourfold increase in paired serum samples (IgG) for pathogen
- f. Histopathologic evidence of pneumonia

Found one in documentation? Record Pneumonia