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

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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*

Occurred after arrival? Keep going
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 ≤ 1 year old

Yes, Yes, and Yes? Keep going

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
Recording Hospital Event: VAP

**PNU2 Bacterial or Filamentous Fungal Pathogens:**
**PNU2 Viral, Legionnella, 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°C or >100.4°F)
- Leukopenia (<4000 WBC/mm³) or leukocytosis (≥12,000 WBC/mm³)
- 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., \( \text{PaO}_2/\text{FiO}_2 \leq 240 \))

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, Legionnella, 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

DO NOT also code 100 = Pneumonia
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**

DO NOT also code 100 = Pneumonia
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°C or >100.4°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., O₂ desaturations (e.g., PaO₂/FiO₂≤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**

DO NOT also code 100 = Pneumonia
Recording Hospital Event: VAP

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

- **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)

- Patient has diagnosed pneumonia
- Patient meets mechanical ventilation criteria
- Patient meets imaging criteria

**Look for signs/symptoms and lab!**

**Found in documentation? Record VAP**

**DO NOT also code 100 = Pneumonia**
ALTERNATE CRITERIA (PNU1), for children >1 year old or ≤12 years old:

At least three:

- Fever (>38.0°C or >100.4°F) or hypothermia (<36.0°C or <96.8°F)
- Leukopenia (<4000 WBC/mm³) or leukocytosis (≥15,000 WBC/mm³)
- 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., O₂ desaturations [e.g., pulse oximetry <94%], increased oxygen requirements, or increased ventilator demand)

Patient has diagnosed pneumonia AND
Patient meets mechanical ventilation criteria AND
Patient meets imaging criteria

Look for signs/symptoms and lab!

Found in documentation? Record VAP

DO NOT also code 100 = Pneumonia
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

DO NOT also code 207 = VAP
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

DO NOT also code 207 = VAP