# Improving Respiratory Culturing Practices

## Key Points:
- **Pneumonia** is defined as a new lung infiltrate plus clinical evidence that the infiltrate is of infectious origin (e.g., fever, leukocytosis, purulent secretion, pleuritic chest pain, cough), and decline in oxygenation.
- Respiratory cultures should not be obtained if pneumonia is not suspected.
  - The presence of purulent or large amounts of sputum in isolation does not indicate pneumonia.
    - The respiratory tract is not sterile; thus, respiratory cultures can grow bacteria in patients without pneumonia.
- **Hospital-acquired pneumonia (HAP)** is defined as pneumonia occurring ≥48 hours after admission.
  - Respiratory culture should be obtained if HAP is suspected.
- **Ventilator-associated pneumonia (VAP)** is defined as pneumonia occurring >48 hours after endotracheal intubation.
  - Respiratory culture should be obtained if VAP is suspected.
  - VAP is unlikely with bacterial burdens below the following thresholds:
    - Protected specimen brush <1,000 CFU/mL
    - Bronchoscopic alveolar lavage fluid <10,000 CFU/mL
    - Endotracheal aspirate <100,000 CFU/mL
- **Aspiration pneumonitis** is an abrupt chemical injury caused by inhalation of gastric contents.
  - Patients often have a rapid decline in respiratory status followed by improvement within 48 hours.
  - Chest-x ray often shows bilateral infiltrates.
  - Antibiotics do not prevent progression to bacterial pneumonia which does not always occur following an aspiration event.
  - Respiratory culture should be considered if purulent sputum is being produced, or if antibiotic treatment is initiated in a hemodynamically unstable patient.
  - Most patients do not develop *pneumonia* and prophylactic antibiotics for cases of aspiration pneumonitis do not provide a clinical benefit.
- **Aspiration pneumonia** can be due to aspiration of small amounts of oropharyngeal secretions or due to large-volume secretions (e.g., vomit).
- Several respiratory conditions may mimic bacterial pneumonia—viral pneumonia, mucus plugging, pulmonary edema, pulmonary embolism.
  - Respiratory cultures and antibiotics are not needed in patients with these conditions.

## How Can Nurses Help Reduce Unnecessary Antibiotics Driven By Respiratory Cultures?
- Ensure that patients have an appropriate indication before obtaining a respiratory culture (see [algorithm](#)).

## References

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