Pneumonia 101 For Nurses

Nurses Take Antibiotic Stewardship Action Initiative

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The Department of Antimicrobial Stewardship, The Johns Hopkins Hospital:

- Valeria Fabre, MD
- Sara E. Cosgrove, MD, MS
- Elizabeth Zink, MS, RN, CCNS, CNRN

The Office of Antibiotic Stewardship, Centers for Disease Control and Prevention:

- Arjun Srinivasan, MD
- Lauri Hicks, DO
- Melinda Neuhausser, PharmD

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Definitions

Pneumonia is diagnosed when the following are present:

- New lung infiltrate
- Clinical evidence that the infiltrate is of infectious origin (e.g., associated fever, leukocytosis, purulent secretions, pleuritic chest pain, cough)
- Decline in oxygenation

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Definitions

- Community-acquired pneumonia (develops in the community)
- Hospital-acquired pneumonia (develops ≥ 48 hours after admission)
- Ventilator-associated pneumonia (develops > 48 hours after endotracheal intubation)
- Aspiration pneumonia: pneumonia following micro- or macro-aspiration of oral or gastrointestinal flora

Understanding what type of pneumonia the patient has helps with antibiotic choices

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PNA Mimics

Infiltrates

- Atelectasis
- Pulmonary edema
- Pulmonary hemorrhage
- Fibrosis
- Tumor
- Sarcoidosis

Oxygen decline

- Pulmonary embolism
- Mucous plugging
- Atelectasis
- Pulmonary edema
- Pleural effusions
- Aspiration pneumonitis

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The Color Of The Sputum Does Not Indicate Infection

- 241 patients presenting with acute cough
  - "Proof of infection": bacterial growth along with moderate number of leukocytes/LPF
  - Lack of correlation between sputum color and infection in healthy individuals
  - There was good correlation for patients with underlying chronic lung disease
- 3,402 patients with acute or worsened cough
  - Sputum color was not associated with resolution of symptoms over time
  - Symptom resolution was not associated with antibiotics

"If There Are Bacteria, There Has To Be An Infection…"

- The presence of bacteria growing in cultures from a non-sterile site **does not equal infection**
  - Examples of non-sterile sites where bacteria may be found and the patient may not necessarily have an infection include the respiratory tract and wounds
  - Case:
    - 65 yo man with chronic tracheostomy admitted for pneumonia
    - Sputum culture grows MSSA treated with 7 days of oxacillin
    - Patient is markedly improved – off the ventilator, afebrile, respiratory secretions back to baseline
    - Before discharge another sputum sample is sent which shows few MSSA and light PMNs. The primary team is considering extending treatment. Is this appropriate?

Tracheobronchitis

- Defined as fever with no other recognizable cause and new or increased sputum production, positive endotracheal tube aspirate culture (>10^6 CFU/ml) and no radiographic evidence of pneumonia
- It is reasonable to NOT treat ventilator-associated tracheobronchitis with antibiotics
- Treatment of tracheobronchitis can be considered in patients with copious purulent respiratory secretions despite aggressive suctioning OR those patients with copious purulent secretions that are affecting the ability to extubate
  - Treatment is shorter than pneumonia (3-5 days)
  - Oral agents should be considered

Aiming For Safer Antibiotic Use

- Every time a patient takes an antibiotic, it is an opportunity for bacteria to become more resistant
  - This is a disadvantage to the patient as resistant infections are more difficult to treat
- 1 in 5 patients who receive an antibiotic will experience an adverse event
- 1 in 3 antibiotics used in the hospital are inappropriate in some way (not needed, given for too long, too broad-spectrum)
- The goal is for the patient to receive antibiotics *only* when needed

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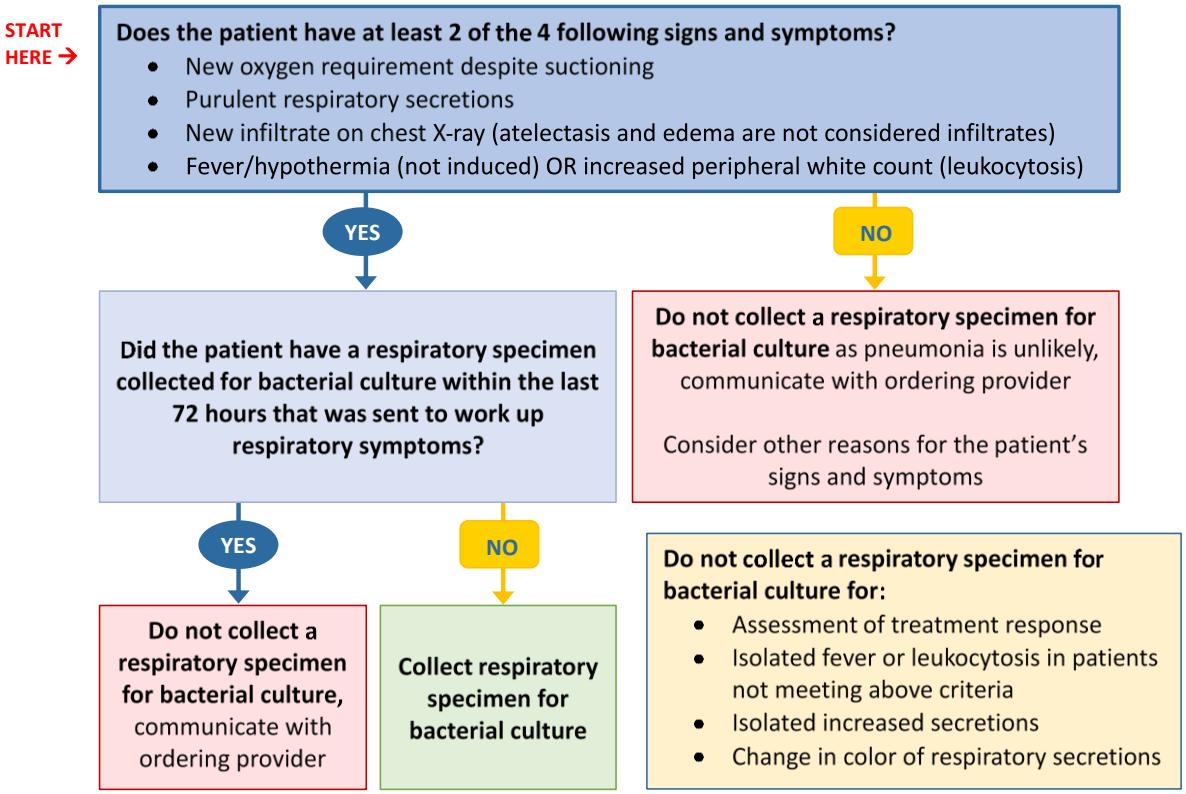
How Can Nurses Help Reduce Unnecessary Antibiotics Driven By Non-Infectious Respiratory Processes?

- Familiarize yourself with the definition of pneumonia
- When a patient reports or develops respiratory symptoms, consider other etiologies before obtaining a respiratory culture
- Do not send respiratory specimens for culture when there is no concern for infection
- Do not send a sputum culture for test-of-cure

Should I Collect a Respiratory Specimen for Bacterial Culture? Algorithm for Adult Intensive Care Unit Patients

Developed by The Johns Hopkins Hospital Department of Antimicrobial Stewardship



Kalil et al., Management of Adults With Hospital-acquired and Ventilator-associated Pneumonia: 2016 Clinical Practice Guidelines by the Infectious Diseases Society of America and the American Thoracic Society

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