1.21 PNEUMONIA

Introduction

Lower respiratory tract infections cause substantial morbidity and mortality in the pediatric population. Worldwide, pneumonia is the leading cause of death in children under 5 years of age. In the United States, pneumonia accounts for just over 7% of pediatric hospitalizations. Pneumonia is commonly caused by a viral infection, especially in children less than 2 years old. Even with extensive testing, bacterial cause of pneumonia will be identified in the small minority of hospitalized children. Non-viral etiologies for pneumonia differ based upon age and underlying risk factors resulting in the need to tailor antimicrobials appropriately. Surgical intervention may be required when pneumonia is complicated by pleural effusion or abscess. Pediatric hospitalists frequently care for children with pneumonia and should be able to provide evidence-based care and coordinate subspecialty care when necessary.

Knowledge

Pediatric hospitalists should be able to:

- Describe the key features of the history and physical examination that support or refute the diagnosis of pneumonia.
- Discuss the variations in clinical presentation that may accompany chronic health conditions of childhood, such as cystic fibrosis, chronic lung disease, congenital heart disease, immunodeficiency, and others.
- Review alternate diagnoses which may mimic the presentation of pneumonia including anatomic defects, systemic diseases, heart failure, and others.
- List common bacterial, atypical bacterial, and viral organisms causing pneumonia and state how these differ based on age.
- Name other causes of infectious and non-infectious pneumonias such as lipoid, inhalation pneumonitis, aspiration, and others.
- Provide indications for hospital admission and determine the appropriate level of care.
- Discuss the influence of national immunization practices and antimicrobial use on predominant organisms and resistance patterns.
- Describe local resistance patterns for predominant infectious organisms.
- Discuss the benefits and limitations of radiography and laboratory evaluation in the diagnosis of pneumonia.
- Describe common complications seen with pneumonia, including comorbidities or infectious etiologies associated with higher risk for each.
- Describe the indications and options for surgical intervention in patients with complicated pneumonia, including occurrence of parapneumonic effusion, empyema, necrotizing pneumonia, abscess, pneumothorax, and other underlying structural issue.
- Summarize goals for hospital discharge, attending to symptoms, oxygenation saturation, hydration, the family/caregivers' needs, and outpatient management plans.

Skills

Pediatric hospitalists should be able to:

- Diagnose pneumonia by efficiently performing an accurate history and physical examination, determining if key features of the disease are present.
- Order appropriate laboratory and radiographic tests to guide treatment and correctly interpret the results.
- Ensure proper isolation for patients with pneumonia.
- Direct an evidence-based treatment plan, including cardiorespiratory monitoring, oxygen supplementation, and appropriately selected antibiotic therapy as indicated.
- Interpret chest radiographs, distinguishing between consolidation, effusion, mass, and other findings.
- Perform careful reassessments daily and as needed, note changes in clinical status, and respond with appropriate actions.
- Determine when consultation (such as surgical, pulmonary, interventional radiology, or other subspecialty) or transfer to a higher level of care is indicated.
- Identify patients requiring extended evaluation for underlying anatomic or systemic disease.
- Create a comprehensive discharge plan.
- Coordinate discharge efficiently and effectively with patients, the family/caregivers, subspecialists, and the primary care provider, including home care needs and follow-up as appropriate.

Attitudes

Pediatric hospitalists should be able to:

- Role model and advocate for strict adherence to handwashing and other infection control practices.
- Realize the importance of antimicrobial stewardship and consistently modify prescribing practice to reflect best practices attending to local resistance patterns.
- Realize responsibility for communicating effectively with patients, the family/caregivers, and healthcare providers regarding findings and care plans.
- Acknowledge the importance of collaboration with subspecialists to render safe and efficient treatment.
- Exemplify adherence to latest research and guidelines to ensure that prescribed testing and therapeutic modalities are effective and evidence based.

Systems Organization and Improvement

In order to improve efficiency and quality within their organizations, pediatric hospitalists should:

- Work with hospital, community, and infectious disease experts to develop and sustain local communications regarding resistance pattern changes.
- Lead, coordinate, or participate in the development and implementation of cost-effective, safe, evidence-based care pathways to standardize the evaluation and management of hospitalized children with pneumonia.

References

1. Bradley JS, Byington CL, Shah SS, et al. The management of community-acquired pneumonia in infants and children older than 3 months of age: clinical practice guidelines by the Pediatric Infectious Diseases Society and the Infectious Diseases Society of America. *Clin Infect Dis.* 2011;53: e25-76. https://academic.oup.com/cid/article/53/7/e25/424286 Accessed August 28, 2019.