

HOSPITAL PHYSICIAN®

PULMONARY DISEASE BOARD REVIEW MANUAL

STATEMENT OF EDITORIAL PURPOSE

The *Hospital Physician Pulmonary Disease Board Review Manual* is a peer-reviewed study guide for fellows and practicing physicians preparing for board examinations in pulmonary disease. Each manual reviews a topic essential to current practice in the subspecialty of pulmonary disease.

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Community-Acquired Pneumonia

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Community-Acquired Pneumonia

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INTRODUCTION

Community-acquired pneumonia (CAP) is a major cause of morbidity and mortality in the United States and the world. Influenza and pneumonia are the eighth leading cause of death in the United States and the sixth leading cause of death in persons over age 65 years.¹ In 2004, over 59,000 deaths were attributed to influenza and pneumonia, with a combined age-adjusted death rate of 20.3 deaths per 100,000 persons.¹ In 2005, approximately 1.4 million patients were discharged with the diagnosis of pneumonia, and these patients had an average length of stay of 5.3 days.² In 2004, the estimated cost of treating CAP in the employed population was \$12.5 billion.³

With global travel comes the emergence of new, virulent pathogens with the potential to cause global epidemics, such as severe acute respiratory syndrome and Avian influenza. With widespread availability and use of broad-spectrum antibiotics, familiar pathogens are evolving with new resistances to standard antimicrobials. Community-acquired methicillin-resistant *Staphylococcus aureus* (CA-MRSA) and drug-resistant *Streptococcus pneumoniae* (DRSP) are examples of pathogens that are now more difficult to treat due to resistance. These emerging pathogens have made the initial management of CAP increasingly challenging. In addition, the Centers for Medicare and Medicaid Services (CMS) recently supported documentation of core measures aimed at evaluating the performance of health care institutions in caring for CAP patients that may ultimately influence financial return for these institutions. This has prompted many institutions to more closely regulate the treatment of CAP by adopting guidelines to ensure future accreditation. This manual reviews the diagnosis and management of patients with CAP.

DIAGNOSIS

The diagnosis of CAP should be considered when clinical symptoms and signs suggest a respiratory tract infection in combination with new radiologic evidence

of consolidation. Microbiologic evidence of infection at initial diagnosis is not always readily available and is not necessary for diagnosis. History suggestive of an acute respiratory infection includes cough, sputum production, dyspnea, pleuritic chest pain, and fever. Physical examination may reveal fever, tachypnea, tachycardia, and lung examination abnormalities including but not limited to crackles and bronchial breath sounds. Oxygenation should be promptly assessed in all patients by either pulse oximetry or arterial blood gas. Delayed assessment of oxygenation has been associated with delayed delivery of antibiotics and increased risk for intensive care unit (ICU) death in severe CAP.⁴

Radiographic features of CAP are varied and for the most part are not specific to organism. Findings can range from an air-space consolidation in 1 or more lobes to diffuse bilateral reticular or nodular infiltrates. In addition to confirming the diagnosis, imaging studies may yield alternative diagnoses, such as congestive heart failure. Most guidelines recommend that all patients with a suspected diagnosis of CAP undergo chest radiography.^{5,6} While chest radiography remains the gold standard for the diagnosis of CAP, it is neither the most sensitive nor the most specific test for this diagnosis. High-resolution computed tomography (CT) has been shown to increase radiographic confirmation of CAP beyond chest radiography alone,⁷ but routine use of CT is not recommended because of its higher radiation dose and cost as compared with chest radiography.

The yield from routine blood cultures is relatively low, ranging from 5.6% to 13.9%. Because results from blood cultures seldom lead to a change in antibiotics in non-severe CAP, some have suggested that blood cultures be reserved for patients with severe CAP or for compromised hosts.^{8,9} However, a positive blood culture may direct treatment and allow for future deescalation in treatment for an individual patient. Most experts still recommend obtaining 2 pretreatment sets of blood cultures from all patients with severe pneumonia and in most patients hospitalized for CAP.^{5,6} Only 39% to 62% of patients are able to produce sputum, and of these only 54% to 57% of specimens are of adequate quality; between 49% and 56% of adequate specimens will have positive cultures.¹⁰⁻¹³ The overall yield for sputum