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**Community-Acquired Pneumonia: Pathophysiology and Host Factors with Focus on Possible New Approaches to Management of Lower Respiratory Tract Infections**  
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The present understanding of the pathophysiology of community-acquired pneumonia (CAP) explains the mechanism for many specific manifestations, but does not address adequately why only some patients experience complications. Recent advances in understanding the genetics of complex illnesses offer hope for a more complete insight into the pathogenesis of CAP. This article reviews genetic variation in the molecules involved in the known pathogenic mechanisms of CAP, including cough, bacterial recognition, inflammation and the compensatory anti-inflammatory response, and organ dysfunction.

**Epidemiology and Etiology of Community-Acquired Pneumonia**  
Lionel A. Mandell  
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The seriousness of community-acquired pneumonia (CAP), despite being a reasonably common and potentially lethal disease, often is underestimated by physicians and patients alike. CAP results in more than 10 million visits to physicians, 64 million days of restricted activity, and 600,000 hospitalizations. This article discusses the epidemiology and bacterial causes of CAP in immunocompetent adults and the severe acute respiratory syndrome coronavirus.

**Antibacterial Drug Resistance: Implications for the Treatment of Patients with Community-Acquired Pneumonia**  
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This article challenges the assertion that current levels of antibacterial drug resistance should influence treatment decisions for patients who have community-acquired pneumonia (CAP). The article will discuss the following topics related to patients who...
have CAP: (1) the relevant bacteriologic and clinical outcomes that should be investigated to inform empirical treatment, (2) the study design options for studying the impact of antibacterial drug resistance on bacteriologic and clinical outcomes, and (3) the evidence that antibacterial drug resistance influences bacteriologic and clinical outcomes.

Community-Acquired Pneumonia: Severity of Illness Evaluation
Mark Woodhead

Severity-of-illness assessment is now an accepted part of clinical practice and clinical research for the management of adults who have community-acquired pneumonia. Several approaches to this issue have been devised based on severity-of-illness scores or rules, some related to site of management. No single approach has been found to be superior to others, but further research into their effect on outcome in clinical practice is required. It is likely that different approaches may suit different populations and health care systems.

Diagnostic Test for Etiologic Agents of Community-Acquired Pneumonia
John G. Bartlett

Divergent opinions have evolved concerning the clinical usefulness of diagnostic tests for pneumonia, making this topic one of the more controversial areas of pulmonary infections; however, microbiology studies in patients with community-acquired pneumonia are evolving. This article deals with methods and indications for detecting the etiologic agent of pulmonary infections. Its discussion is restricted to diagnostic tests in immunocompetent adults. The article offers an overview of the topic, a description of conventional microbiology methods, and a discussion of detection methods for specific microbes, with emphasis on microbes that are the most important or most frequent.

Empiric Treatment of Ambulatory Community-Acquired Pneumonia: Always Include Treatment for Atypical Agents
Thomas J. Marrie

The most common etiologic agents of “atypical pneumonia” are *Mycoplasma pneumoniae*; several respiratory viruses, including influenza A and B, adenovirus, respiratory syncytial virus, human metapneumovirus; *Chlamydia pneumoniae*; *Legionella* species; and *Chlamydia psittaci*. Although these agents account for up to 50% of cases of community-acquired pneumonia treated on an ambulatory basis, there are no data from randomized clinical trials to indicate whether empiric antibiotic therapy should always include agents that are active against the bacterial atypical agents.
Processes of Care for Community-Acquired Pneumonia

Julio A. Ramírez

The most important processes of care in patients with community-acquired pneumonia (CAP) include diagnosis, hospitalization, respiratory isolation, microbiologic workup, oxygen therapy, empiric therapy, switch therapy, hospital discharge, and prevention of CAP. The recommended course of action for each process of care should be clear, succinct, and evidence based. Improving processes of care at the local-hospital level is a secure way to produce a beneficial effect in CAP clinical and economic outcomes. This article reviews the most important recommended courses of action, the rationale for the recommendation, and how to evaluate the process at the local level using process-of-care indicators.

Acute Exacerbations of Chronic Bronchitis: New Developments Concerning Microbiology and Pathophysiology—Impact on Approaches to Risk Stratification and Therapy

Sanjay Sethi and Timothy F. Murphy

Exacerbations are a characteristic feature of chronic obstructive pulmonary disease and contribute significantly to associated morbidity and mortality. Renewed interest in this common clinical problem and research using new investigative tools has enhanced substantially the understanding of the pathogenesis of exacerbations. Results of recent clinical trials and observational studies have allowed refinements in treatment of exacerbations that should improve patient outcomes. This article discusses a rational, stratified approach to the use of antibiotics for this condition based on these recent studies.

Nonresponses and Treatment Failures with Conventional Empiric Regimens in Patients with Community-Acquired Pneumonia

James S. Tan

Pneumonia is one of the leading causes of death throughout the world. Community-acquired pneumonias (CAPs) usually are treated empirically without an initial culture or established cause. Treatment failure may result in prolonged hospitalization, progressive pneumonia, contiguous or metastatic infection, and increased mortality rate. Causes of treatment failure include inadequate or inappropriate antimicrobial therapy, unusual pathogens, purulent complications of pneumonia, and noninfectious illness. An improved understanding of the causes of treatment failure can improve the outcome and the cost effectiveness of treatment. This article reviews the reasons for failure to respond among patients with CAP who failed initial empiric therapy.
Lower Respiratory Tract Infections: Prevention Using Vaccines
Cynthia G. Whitney and Scott A. Harper

Although there are myriad causes of lower respiratory tract infections, vaccines are available to prevent two of the most common and most deadly: pneumococcal disease and influenza. The vaccines are recommended for older adults and for younger persons with certain high-risk medical conditions. In addition, health care workers and others caring for high-risk persons should receive influenza vaccine. Although both vaccines are effective and cost-effective, they are underused. Increasing vaccine use, through standing orders and other methods, is a public health priority.

Management of Acute Bronchitis in Healthy Adults
Eva Aagaard and Ralph Gonzales

Acute respiratory infections (ARIs) are the most common infections in humans, accounting for half of all acute conditions each year in the United States. Acute bronchitis episodes represent a significant portion of these illnesses. This article focuses on acute bronchitis in otherwise healthy individuals.

Healthcare-Associated Pneumonia in Adults: Management Principles to Improve Outcomes
Donald E. Craven, Richard Palladino, and Daniel P. McQuillen

Patients with healthcare-associated pneumonia include those with hospital-acquired pneumonia, those with ventilator-associated pneumonia, those who were hospitalized in an acute care hospital for at least 2 days within 90 days of the infection, and those who have resided in a nursing home or long-term care facility. Infection with multidrug-resistant (MDR) pathogens may result in a delay in initiating appropriate antibiotic therapy, which in turn may increase patient morbidity and mortality and hospital costs. This article primarily addresses principles of management to improve patient outcomes and reduce the emergence of MDR pathogens.

Re-evaluation of the Therapy of Severe Pneumonia Caused by Streptococcus pneumoniae
Joseph F. Plouffe, Jr and Daniel R. Martin

Pneumonia caused by Streptococcus pneumoniae is the most deadly form of community-acquired pneumonia. The death rate of bacteremic pneumococcal pneumonia has remained constant over the past 50 years. Several retrospective reviews of bacteremic pneumococcal pneumonia suggest that dual therapy with a β-lactam and a macrolide antimicrobial agent is associated with a lower case fatality rate than therapy with a β-lactam alone. These studies are
reviewed, potential mechanisms are suggested, and future studies are discussed.

Local Guidelines for Community-Acquired Pneumonia: Development, Implementation, and Outcome Studies 975
Nathan C. Dean and Kim A. Bateman

For changes in practice to occur, pneumonia guidelines written by specialty organizations must be simplified, adapted for local practice and local bacterial susceptibility patterns, and implemented using decision support available to clinicians at the point of care. Key process-of-care variables should be monitored during the never-ending process of implementation. Some clinical outcome data show benefit following implementation of well-designed guidelines, but further research is needed.

Antimicrobial Therapy of Community-Acquired Pneumonia 993
Thomas M. File, Jr and Michael S. Niederman

Community-acquired pneumonia (CAP) is a common disorder that is potentially life-threatening, especially in older adults and patients with comorbid disease. Despite substantial progress in therapeutic options, CAP remains a primary cause of death from infectious disease in the United States. The mainstay of treatment for most patients is appropriate antimicrobial therapy. This article reviews the principles for initial antimicrobial therapy, highlights some of the differences in approaches to antimicrobial drug selection in selected guidelines, and includes new recommendations for empiric and pathogen-directed therapy of CAP.

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