



<b>Body System:</b> Respiratory		
<b>Session Topic:</b> Pneumonia		
<b>Educational Format</b>		<b>Faculty Expertise Required</b>
<b>REQUIRED</b>	Interactive Lecture	Expertise in the field of study. Experience teaching in the field of study is desired. Preferred experience with audience response systems (ARS). Utilizing polling questions and engaging the learners in Q&A during the final 15 minutes of the session are required.
<b>OPTIONAL</b>	Problem-Based Learning (PBL)	Expertise teaching highly interactive, small group learning environments. Case-based, with experience developing and teaching case scenarios for simulation labs preferred. Other workshop-oriented designs may be accommodated. A typical PBL room is set for 50-100 participants, with 7-8 each per round table. <u>Please describe your interest and plan for teaching a PBL on your proposal form.</u>
<b>Professional Practice Gap</b>	<b>Learning Objective(s) that will close the gap and meet the need</b>	<b>Outcome Being Measured</b>
<ul style="list-style-type: none"> <li>Hospital readmissions rates for pneumonia are the 3<sup>rd</sup> highest among Medicare patients of all conditions.</li> <li>Family physicians have knowledge gaps with regard to treating and managing pneumonia; including community-acquired (CAP) and hospital-acquired (HAP) and ventilator-associated pneumonia (VAP).</li> <li>There is often inconsistent adherence to CAP, HAP &amp; VAP guidelines.</li> <li>2016 Infectious Disease Society of America (IDSA)/American Thoracic Society (ATS) guidelines change to distinguish HAP &amp; VAP; no longer using the category “healthcare-associated pneumonia” (HCAP)</li> </ul>	<ol style="list-style-type: none"> <li>Monitor the health of patients who have weakened immune systems to mitigate risk factors that increase their risks of developing pneumonia.</li> <li>Prescribe appropriate empiric therapy for CAP based on suspected pathogen and local susceptibility patterns.</li> <li>Identify risk factors for multidrug-pathogens in patients who have HAP or VAP.</li> <li>Prescribe appropriate antibiotic therapy for HAP or VAP based on risk factors for multidrug-resistant pathogens, predominant pathogens in the clinical setting and local susceptibility patterns.</li> <li>Provide appropriate vaccines for prevention of pneumococcal pneumonia and influenza per current guidelines.</li> </ol>	Learners will submit written commitment to change statements on the session evaluation, indicating how they plan to implement presented practice recommendations.
<b>ACGME Core Competencies Addressed (select all that apply)</b>		



X	Medical Knowledge	X	Patient Care
	Interpersonal and Communication Skills		Practice-Based Learning and Improvement
	Professionalism	X	Systems-Based Practice

**Faculty Instructional Goals**

Faculty play a vital role in assisting the AAFP to achieve its mission by providing high-quality, innovative education for physicians, residents and medical students that will encompass the art, science, evidence and socio-economics of family medicine and to support the pursuit of lifelong learning. By achieving the instructional goals provided, faculty will facilitate the application of new knowledge and skills gained by learners to practice, so that they may optimize care provided to their patients.

- Provide up to 3 evidence-based recommended practice changes that can be immediately implemented, at the conclusion of the session; including SORT taxonomy & reference citations
- Facilitate learner engagement during the session
- Address related practice barriers to foster optimal patient management
- Provide recommended journal resources and tools, during the session, from the American Family Physician (AFP), Family Practice Management (FPM), and Familydoctor.org patient resources; those listed in the References section below are a good place to start
  - Visit <http://www.aafp.org/journals> for additional resources
  - Visit <http://familydoctor.org> for patient education and resources
- Provide specific strategies for monitoring the health of patients who have weakened immune systems to mitigate risk factors that increase their risks of developing pneumonia
- Provide evidence-based recommendations and updated guidelines for treatment and management of pneumonia (including CAP, HAP and VAP)
- Provide recommendations regarding guidelines for Medicare reimbursement.
- Provide recommendations to maximize office efficiency and guideline adherence to the diagnosis and management of
- Provide an overview of newly available treatments, including efficacy, safety, contraindications, and cost/benefit relative to existing treatments.

**Needs Assessment**

Globally, pneumonia causes more deaths, especially in pregnant women, than any other infectious disease, including AIDS, tuberculosis and malaria, but it usually can be treated with antibiotics or antiviral drugs. In 2010 there were 1.1 million hospital discharges for pneumonia; and in 2011 there were 88,800 30-day hospital readmissions (readmission rate of 17.9 per 100) for Medicare patients, which is the third behind congestive heart failure and septicemia (except for labor).<sup>1,2</sup> It is imperative for the at-risk populations (very young and very old, and pregnant women for some strains of influenza) to be under the continuous care of a family physician to constantly monitor their health and treat respiratory symptoms accordingly at the first sign of infection. As the population continues to age dramatically, the prevalence of pneumonia is likely to increase and thus become a significant concern for physicians and other healthcare providers.<sup>3,4</sup>



Family physicians manage patients across the entire life span, in multiple ambulatory, urgent-care, emergency care, and institutional practice settings. As such, they require continuous education and training on strategies to remain up to date on current guidelines with respect to the prevention, diagnosis, and treatment of patients who have acquired pneumonia or are at risk of acquiring pneumonia. Data from a recent American Academy of Family Physicians (AAFP) CME Needs Assessment survey indicate that family physicians have knowledge gaps with regard to treating and managing pneumonia; including community-acquired (CAP) and ventilator-associated pneumonia (VAP).<sup>5</sup> Additionally CME outcomes data from 2012-2016 AAFP FMX (formerly, Assembly): *Community and Hospital Acquired Pneumonia* sessions suggest that physicians have knowledge and practice gaps related to managing complicated or advanced issues regarding the management of healthcare-acquired pneumonia; evidence-based guidelines adherence for screening, diagnosing, & ordering diagnostic tests; the use of validated clinical prediction tool to help guide them when deciding on inpatient or outpatient treatment of CAP; and the application of evidence-based guidelines for the use of antibiotics in the treatment of pneumonia.<sup>6-10</sup>

Evidence-based guidelines from the American Thoracic Society (ATS) and the Infectious Diseases Society of American (IDSA) recommend that physicians make an objective risk assessment using a prospectively validated clinical prediction tool to help guide them when deciding on inpatient or outpatient treatment of community-acquired (CAP).<sup>11</sup> Physicians should consider the American College of Radiology (ACR) *Appropriateness Criteria® acute respiratory illness in immunocompetent patients* when evaluating the appropriateness of initial radiologic examinations for acute respiratory illness in immunocompetent patients.<sup>12</sup>

Family physicians should use a mortality prediction tool, such as the Pneumonia Severity Index, to determine whether patients with CAP require hospitalization or can be treated as outpatients.<sup>13</sup> Family physicians should utilize evidence-based practice recommendations to diagnose and manage CAP in adults, both previously health and those with special conditions that may make diagnosis or treatment challenging.<sup>14, 15</sup> Because CAP is a significant cause of respiratory morbidity and mortality in children, family physicians should be familiar with evidence-based practice recommendations for the management of children with CAP.<sup>16,17</sup> Family physicians often manage the care of patients who are in acute-care hospital settings or long-term residential care facilities. As such, they should be familiar with evidence-based practice guidelines related to health-care acquired pneumonia.<sup>18</sup> Family physicians should also be able to utilize the AMA PCPI quality measures related to pneumonia to establish quality care benchmarks and metrics aimed at optimizing care of patients with regard to prevention, diagnosis, and treatment of pneumonia.

Physicians should also be kept up to date on new treatment therapies, changes to therapies, or warnings associated with existing therapies. In March 2014, the U.S. Food and Drug Administration (FDA) approved revisions to the doripenem label warning clinicians about increased mortality rates in patients who received doripenem rather than imipenem for ventilator-associated bacterial pneumonia, based on results of a randomized trial that was stopped early due to safety concerns.<sup>19</sup> For hospitalized patients with CAP, glucocorticoids as adjunctive therapy to antibiotics have the potential to reduce the inflammatory response and decrease morbidity.<sup>20</sup> In



June 2013, the FDA approved Vibativ (telavancin) for the treatment of hospital-acquired and ventilator-associated bacterial pneumonia caused by *staph aureus*.<sup>21</sup>

Physicians should be familiar with current CDC pneumococcal vaccination recommendations; including pneumococcal conjugate vaccine (PCV13), recommended for all children younger than 5 years old, all adults 65 years or older, and people 6 years or older with certain risk factors; and pneumococcal polysaccharide vaccine (PPSV23) which is recommended for all adults over 65 years or older, and people who are 2 years through 64 years of age who are at high risk of pneumococcal disease.<sup>22</sup> More specifically, the AAFP provides the following recommendation:<sup>23</sup>

- Use of PCV13 and PPSV23 Among Adults  $\geq 19$  Years. Current AAFP recommendations for routine use of PCV13 in adults aged  $\geq 19$  years with immunocompromising conditions, functional or anatomic asplenia, cerebrospinal fluid leak, or cochlear implants remain unchanged.
- Use of PCV13 Among Adults  $\geq 65$  Years. Both PCV13 and PPSV23 should be administered routinely in series to all adults aged  $\geq 65$  years.
- Pneumococcal vaccine-naïve persons. Adults aged  $\geq 65$  years who have not previously received pneumococcal vaccine or whose previous vaccination history is unknown should receive a dose of PCV13 first, followed by a dose of PPSV23. The dose of PPSV23 should be given 6–12 months after a dose of PCV13. If PPSV23 cannot be given during this time window, the dose of PPSV23 should be given during the next visit. The two vaccines should not be co-administered, and the minimum acceptable interval between PCV13 and PPSV23 is 8 weeks.
- Previous vaccination with PPSV23. Adults aged  $\geq 65$  years who have previously received  $\geq 1$  doses of PPSV23 also should receive a dose of PCV13 if they have not yet received it. A dose of PCV13 should be given  $\geq 1$  year after receipt of the most recent PPSV23 dose. For those for whom an additional dose of PPSV23 is indicated, this subsequent PPSV23 dose should be given 6–12 months after PCV13 and  $\geq 5$  years after the most recent dose of PPSV23 (15).
- Potential Time-Limited Utility of Routine PCV13 Use Among Adults  $\geq 65$  Years. The recommendations for routine PCV13 use among adults aged  $\geq 65$  years will be reevaluated in 2018 and revised as needed.

Physicians may want to consider the following evidence-based clinical recommendations:<sup>17,24,25</sup>

- In patients with suspected CAP, chest radiography or lung ultrasonography should be performed to confirm the diagnosis.
- Testing for specific pathogens should be ordered only when it would alter standard empiric therapy, which is rare in outpatients.
- Use of procalcitonin testing can assist in the management of CAP and reduce antibiotic exposure without compromising patient safety.
- Validated mortality and pneumonia severity assessment tools should be used to determine the appropriate level of care for patients with CAP.
- Patients with CAP who are admitted to the intensive care unit should be treated with dual antibiotic therapy.
- For patients with severe CAP, use of corticosteroids within 36 hours improves outcomes.
- Influenza vaccination for all patients and pneumococcal vaccination for patients 65 years and older and other high-risk patients are the mainstays of CAP prevention.



- The absence of tachypnea is the most useful clinical finding for ruling out CAP in children.
- Chest radiography has not been shown to improve clinical outcomes or change treatment of CAP in children.
- Empiric antibiotic choices in children with CAP should be based on the patient's age and severity of illness, and local resistance patterns of pathogens.
- Oral amoxicillin and intravenous penicillin G are equally effective in the treatment of hospitalized children with nonsevere CAP. However, amoxicillin is generally more cost-effective.
- Macrolides are the empiric antibiotics of choice for children five to 16 years of age with CAP because of their activity against *Mycoplasma pneumoniae* and *Chlamydia pneumoniae*.
- Routine childhood immunization with the pneumococcal conjugate vaccine significantly reduces the incidence of invasive pneumococcal disease in children.
- Nursing home residents should be immunized with the 23-valent pneumococcal polysaccharide vaccine (Pneumovax).
- Nursing home residents should be immunized with the seasonal influenza vaccine.
- Physicians should obtain chest radiography and pulse oximetry measurement in nursing home residents who have signs and symptoms of a pulmonary infection and who are candidates for treatment.
- Antibiotics should be administered as soon as possible after diagnosing pneumonia in a nursing home patient.
- Oral antibiotics can be used in patients with nursing home-acquired pneumonia who are treated in the nursing home.
- Patients with nursing home-acquired pneumonia should be treated for a total of five to eight days, unless they have *Pseudomonas aeruginosa* infection, are medically unstable, or demonstrate an inadequate clinical response to therapy.
- Patient and family wishes, goals of care, and availability of diagnostic tests and therapies should be considered when deciding whether or where to treat pneumonia in nursing home residents.

Additionally, the American Thoracic Society (ATS) and the Infectious Diseases Society of America (IDSA) have released updated (2016) guidelines for *Management of Adults With Hospital-acquired and Ventilator-associated Pneumonia*.<sup>26</sup> The category of healthcare-associated pneumonia (HCAP) was included in the prior guidelines; however, HCAP was not included in the 2016 guidelines because there is increasing evidence that many patients with HCAP are not, in fact, at high risk for MDR pathogens and because this designation is not a good predictor of who will have an infection with an MDR organism.

Resources: Evidence-Based Practice Recommendations/Guidelines/Performance Measures

- Community-Acquired Pneumonia in Adults: Diagnosis and Management<sup>25</sup>
- Diagnosis and Management of Community-Acquired Pneumonia in Adults<sup>15</sup>



- 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<sup>27</sup>
- Community-Acquired Pneumonia in Children<sup>17</sup>
- Treatment of Nursing Home-Acquired Pneumonia<sup>18</sup>
- Common Questions About Pneumonia in Nursing Home Residents<sup>24</sup>
- Clinical policy: critical issues in the management of adult patients presenting to the emergency department with community-acquired pneumonia<sup>28</sup>
- Clinical practice guideline for the evaluation of fever and infection in older adult residents of long-term care facilities: 2008 update by the Infectious Diseases Society of America<sup>29</sup>
- Prevention of ventilator-associated pneumonia. In: Prevention and control of healthcare-associated infections in Massachusetts<sup>30</sup>
- CDC Guidelines for preventing health-care-associated pneumonia<sup>31</sup>
- American Thoracic Society (ATS) guidelines for *Community-Acquired Pneumonia (CAP)* and *Hospital-Acquired Pneumonia (HAP)*<sup>32</sup>
- AAFP Recommended adult immunization schedule—United States, 2015<sup>33</sup>
- American Academy of Family Physicians (AAFP). Pneumococcus<sup>23</sup>
- AMA PCPI Approved Quality Measures (pneumonia-related quality measures)<sup>34</sup>
- Outpatient vs. inpatient treatment of community acquired pneumonia<sup>11</sup>
- Vaccine administration: making the process more efficient in your practice<sup>35</sup>
- Engaging Patients in Collaborative Care Plans<sup>36</sup>
- FamilyDoctor.org. Pneumonia | Overview (patient resource)<sup>37</sup>

## References

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