

December 2019 ~ Resource #351201

## Preventing and Treating Community-Acquired Pneumonia

--The toolbox below provides practical tips and resources to help prevent and treat pneumonia, and prevent hospital admission and readmission--

**Abbreviations:** ACIP = Advisory Committee on Immunization Practices; ATS = American Thoracic Society; CAP = Community-Acquired Pneumonia; CDC = Centers for Disease Control and Prevention; COPD = Chronic Obstructive Pulmonary Disease; IDSA= Infectious Diseases Society of America; IV = intravenous; MRSA = methicillin-resistant *Staphylococcus aureus*; PCR = Polymerase Chain Reaction

Goal	Suggested Strategies or Resources
Prevent and treat influenza.	<ul style="list-style-type: none"> <li>• Vaccinate all patients six months and older, including pregnant women, yearly.<sup>1,2</sup></li> <li>• Get vaccinated yourself, to set a good example for patients and coworkers.</li> <li>• Choose the right flu vaccine for the patient. Get our chart, <i>Flu Vaccines</i> (U.S. Subscribers)(Canadian Subscribers) for help sorting out the <b>available vaccines</b>.</li> <li>• The CDC provides flu prevention, diagnosis, and treatment information for healthcare professionals, and surveillance data, at <a href="https://www.cdc.gov/flu/professionals/index.htm">https://www.cdc.gov/flu/professionals/index.htm</a>.</li> <li>• A guide for considering flu testing is available from the CDC at <a href="https://www.cdc.gov/flu/professionals/diagnosis/consider-influenza-testing.htm">https://www.cdc.gov/flu/professionals/diagnosis/consider-influenza-testing.htm</a>.</li> <li>• Canadian healthcare professionals can get information on flu prevention, diagnosis, treatment, and updated surveillance data from the Public Health Agency of Canada at <a href="https://www.canada.ca/en/public-health/services/diseases/flu-influenza/health-professionals.html">https://www.canada.ca/en/public-health/services/diseases/flu-influenza/health-professionals.html</a>.</li> <li>• Provide immunization in your clinic, hospital, or pharmacy.</li> <li>• Encourage use of influenza vaccine standing orders. For help, see <a href="http://www.immunize.org/catg.d/p3067.pdf">http://www.immunize.org/catg.d/p3067.pdf</a>.</li> </ul>
Educate patients about flu prevention.	<ul style="list-style-type: none"> <li>• Get materials to educate patients about flu vaccination and other preventive actions from the CDC at <a href="http://www.cdc.gov/flu/freeresources/index.htm">http://www.cdc.gov/flu/freeresources/index.htm</a>. Includes posters, fact sheets, educational materials for children, sample posts for social media, and more.</li> <li>• Patient education handouts, <i>What to Do If You Get the Flu</i> and <i>No More Excuses... You Need a Flu Vaccine</i>, can be downloaded from our website.</li> <li>• Canadians can get information and materials to educate patients about flu vaccination and other preventive actions from the Public Health Agency of Canada at <a href="http://www.fightflu.ca">http://www.fightflu.ca</a>.</li> </ul>

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Goal	Suggested Strategies or Resources
Vaccinate eligible patients against pneumonia.	<ul style="list-style-type: none"><li>• Routinely vaccinate healthy infants and children against pneumonia per the childhood vaccination schedule.<ul style="list-style-type: none"><li>• Immunocompromised children or children with certain chronic conditions may need both <i>Prevnar 13</i> and <i>Pneumovax 23</i>.<sup>5,11</sup></li></ul></li><li>• Give people 65 and over <i>Pneumovax 23</i> and consider the <i>Prevnar 13</i> vaccine (ACIP).<sup>15</sup> (In Canada, <i>Pneumovax 23</i> is recommended for routine use. <i>Prevnar 13</i> can be provided for additional protection on an individual basis.)<sup>5</sup></li><li>• Check for adults UNDER 65 who need one or both pneumococcal vaccines.<sup>3</sup><ul style="list-style-type: none"><li>• Those who smoke (CDC), have certain chronic conditions (CDC, Health Canada), or live under certain conditions (Health Canada) will need <i>Pneumovax 23</i>.<sup>3,5</sup></li><li>• Immunocompromised patients will need both vaccines.<sup>3,5</sup></li></ul></li><li>• To find out who gets what and when, see our charts of adult pneumococcal vaccination recommendations. (U.S.) (Canada)</li><li>• Screen for pneumonia vaccine eligibility when adults present for their flu shot. They can be given at the same visit.<sup>1,2</sup></li><li>• Encourage adults to document their pneumonia vaccination history on their med list to prevent duplication.</li><li>• Encourage use of pneumonia vaccine standing orders. See <a href="http://www.immunize.org/catg.d/p3066.pdf">http://www.immunize.org/catg.d/p3066.pdf</a> for help.</li></ul>
Educate patients about pneumonia and pneumonia vaccination.	<ul style="list-style-type: none"><li>• Get information for patients about pneumonia and pneumonia vaccination from the CDC at <a href="https://www.cdc.gov/pneumococcal/index.html">https://www.cdc.gov/pneumococcal/index.html</a>, and from the Public Health Agency of Canada at <a href="https://www.canada.ca/en/public-health/services/immunization/vaccine-preventable-diseases/invasive-pneumococcal-disease.html">https://www.canada.ca/en/public-health/services/immunization/vaccine-preventable-diseases/invasive-pneumococcal-disease.html</a>.</li><li>• Get a pneumococcal vaccine waiting room poster and fact sheets about pneumococcal disease and vaccination for patients and parents from the CDC at <a href="http://www.cdc.gov/pneumococcal/resources/print.html">http://www.cdc.gov/pneumococcal/resources/print.html</a>.</li><li>• For help discussing pneumonia vaccination with U.S. patients age 65 years and older, get our handout, <i>I'm a Senior. Which Pneumonia Vaccine Do I Need?</i></li></ul>
Help patients quit smoking.	<ul style="list-style-type: none"><li>• For practical tips and resources to help your patients successfully quit smoking see our toolbox, <i>Smoking Cessation: Helping Patients Who Use Tobacco</i>.</li></ul>

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Goal	Suggested Strategies or Resources
<b>Control high-risk chronic diseases that put patients at risk for pneumonia.</b>	
Asthma	<ul style="list-style-type: none"> <li>• Dose asthma medications correctly. Get our chart, <i>Comparison of Inhaled Asthma Meds</i> (U.S. Subscribers)(Canadian Subscribers), for help.</li> <li>• Our toolbox, <i>Improving Asthma Care</i>, suggests strategies and resources to educate patients, ensure patients are on the right medications for their disease severity, treat exacerbations, and meet other therapeutic goals.</li> <li>• The Global Initiative for Asthma Management and Prevention is available at <a href="http://www.ginasthma.org">http://www.ginasthma.org</a>.</li> <li>• Canadian asthma guidelines are available from the Canadian Thoracic Society at <a href="https://cts-sct.ca/guideline-library/">https://cts-sct.ca/guideline-library/</a>.</li> <li>• Get the NHLBI's National Asthma Education and Prevention Program available at <a href="http://www.nhlbi.nih.gov/guidelines/asthma/asthgdln.pdf">http://www.nhlbi.nih.gov/guidelines/asthma/asthgdln.pdf</a>.</li> </ul>
COPD	<ul style="list-style-type: none"> <li>• Get our toolbox, <i>Improving COPD Care</i>, for suggested strategies or resources to educate patients, ensure patients are on the best medications for their disease severity, treat exacerbations, and meet other therapeutic goals.</li> <li>• Get COPD guidelines from the Global Initiative for Chronic Obstructive Lung Disease at <a href="http://www.goldcopd.org">http://www.goldcopd.org</a>.</li> <li>• Guidelines for prevention of acute COPD exacerbations from the American College of Chest Physicians and the Canadian Thoracic Society are available at <a href="https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4388124/pdf/chest_147_4_894.pdf">https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4388124/pdf/chest_147_4_894.pdf</a>.</li> </ul>
Diabetes	<ul style="list-style-type: none"> <li>• See our toolbox, <i>Improving Diabetes Outcomes</i>, for practical tips and resources to help care for your diabetes patients.</li> <li>• Get our algorithm, <i>Initiation and Adjustment of Insulin Regimens for Type 2 Diabetes</i> (U.S. Subscribers)(Canadian Subscribers).</li> <li>• Get our chart, <i>Comparison of Insulins</i> (U.S. Subscribers)(Canadian Subscribers).</li> </ul>
Heart Failure	<ul style="list-style-type: none"> <li>• Get our toolbox, <i>Improving Heart Failure Care</i>, for target doses of heart failure meds, tools to help educate patients, and other resources to improve patient care and prevent readmissions.</li> </ul>

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Goal	Suggested Strategies or Resources
<p>Empower pneumonia patients for outpatient self-care, help them identify when to seek additional care, and help them prevent future episodes.</p>	<ul style="list-style-type: none"> <li>• Give patients our customizable patient education handout, <i>What I Need to Know About Pneumonia</i>.</li> <li>• Give inpatients, at hospital discharge, a customizable patient handout, <i>Taking Care of Myself, a Guide for When I Leave the Hospital</i>, from the Agency for Healthcare Research and Quality at <a href="http://www.ahrq.gov/patients-consumers/diagnosis-treatment/hospitals-clinics/goinghome/index.html">http://www.ahrq.gov/patients-consumers/diagnosis-treatment/hospitals-clinics/goinghome/index.html</a>.</li> <li>• Get patient information about pneumococcal disease from the CDC at <a href="http://www.cdc.gov/pneumococcal/about/index.html">http://www.cdc.gov/pneumococcal/about/index.html</a>.</li> <li>• Get patient information about community-acquired pneumonia from the National Library of Medicine at <a href="http://www.nlm.nih.gov/medlineplus/ency/article/000145.htm">http://www.nlm.nih.gov/medlineplus/ency/article/000145.htm</a>.</li> </ul>
<p>Triage patients for possible hospital admission.</p>	<ul style="list-style-type: none"> <li>• Utilize pneumonia severity tools to help determine if outpatient treatment is appropriate: <ul style="list-style-type: none"> <li>• Get the Pneumonia Severity Index (PSI) at <a href="https://www.mdcalc.com/psi-port-score-pneumonia-severity-index-cap">https://www.mdcalc.com/psi-port-score-pneumonia-severity-index-cap</a>. The PSI is recommended over CURB-65 by the ATS/IDSA pneumonia guidelines.<sup>6</sup></li> <li>• Get the CURB-65 Score for Pneumonia Severity at <a href="https://www.mdcalc.com/curb-65-score-pneumonia-severity">https://www.mdcalc.com/curb-65-score-pneumonia-severity</a>.</li> </ul> </li> <li>• Get <i>Community-Acquired Pneumonia Clinical Decision Support Implementation Toolkit</i> from the Agency for Healthcare Research and Quality at <a href="https://www.ahrq.gov/professionals/quality-patient-safety/hais/tools/ambulatory-care/cap-toolkit.html">https://www.ahrq.gov/professionals/quality-patient-safety/hais/tools/ambulatory-care/cap-toolkit.html</a>.</li> </ul>
<p>Choose appropriate antibiotics.</p>	<ul style="list-style-type: none"> <li>• Get our chart, <i>Treatment of Community-Acquired Pneumonia in Adults</i>, for a review of the 2019 ATS/IDSA community-acquired pneumonia guidelines.</li> <li>• Omadacycline (<i>Nuzyra</i>) and lefamulin (<i>Xenleta</i>) are not superior to older options, their safety is not as well-established, and their role in outpatient pneumonia needs further study.<sup>6</sup> <i>Baxdela</i> (delafloxacin [U.S.]) has not been proven superior to older options, and has similar warnings as other quinolones.<sup>4</sup> (<i>Baxdela</i> is not addressed in the 2019 ATS/IDSA guidelines. <i>Baxdela</i> was approved for CAP after guideline publication.)</li> </ul>
<p>Fine-tune the treatment spectrum as soon as possible.</p>	<ul style="list-style-type: none"> <li>• Get our chart, <i>Treatment of Community-Acquired Pneumonia in Adults</i>, for guidance on <b>urinary antigen testing</b> (<i>Legionella</i>, Pneumococcus), sputum culture, and the role of procalcitonin. This guidance is from the 2019 ATS/IDSA guidelines, which do not address immunocompromised patients. The CDC recommends checking a urinary antigen test and culturing a lower respiratory specimen for <i>Legionella</i> in patients who are immunocompromised.<sup>14</sup> For more information from the CDC on testing for <i>Legionella</i>, see <a href="https://www.cdc.gov/legionella/clinicians/diagnostic-testing.html">https://www.cdc.gov/legionella/clinicians/diagnostic-testing.html</a>. <ul style="list-style-type: none"> <li>• The urinary antigen test is 95% to 100% specific for <i>L. pneumophila</i> serogroup 1 (Lp1), which may account for over 80% of <i>Legionella</i> cases.<sup>14</sup></li> </ul> </li> <li>• In patients with a positive influenza test, no evidence of a bacterial pathogen, and early clinical stability, consideration could be given to discontinuation of antibiotic treatment at 48 to 72 hours.<sup>6</sup></li> </ul>

More . . .

Goal	Suggested Strategies or Resources
Prevent interactions with antibiotics.	<ul style="list-style-type: none"><li>• See our chart, <i>Antimicrobial Drug Interactions and Warfarin</i>, for help preventing and managing warfarin interactions.</li><li>• Our charts, <i>Cytochrome P450 Drug Interactions</i> and <i>P-glycoprotein Drug Interactions</i>, can help you check for interactions.</li><li>• For help identifying drugs or combos that may increase torsades risk, see our chart, <i>Drug-Induced Long QT Interval</i>.</li></ul>
Ensure patients stay on their medications.	<ul style="list-style-type: none"><li>• See our toolbox, <i>Medication Adherence Strategies</i>.</li><li>• See our patient education handout, <i>Tips for Sticking With Your Meds</i>.</li></ul>
Restrict use of meds associated with increased pneumonia risk.	<ul style="list-style-type: none"><li>• Use medications associated with increased pneumonia risk (e.g., proton pump inhibitors, inhaled corticosteroids, benzodiazepines, antipsychotics, anticholinergics) only when clearly needed.<sup>7-10,12</sup></li></ul>
Prevent avoidable hospital readmissions.	<ul style="list-style-type: none"><li>• See our toolbox, <i>Reducing Hospital Readmissions</i>. This document includes information about providing and billing for transitional care and chronic care management services.</li><li>• Call the patient within two business days of discharge, and see patient within a week of discharge from the hospital.</li><li>• Ensure patient’s chronic illnesses are tuned up.</li><li>• Review current med list and assess adherence.</li></ul>

*Users of this resource are cautioned to use their own professional judgment and consult any other necessary or appropriate sources prior to making clinical judgments based on the content of this document. Our editors have researched the information with input from experts, government agencies, and national organizations. Information and internet links in this article were current as of the date of publication.*

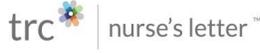
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## What I Need to Know About Pneumonia

Pneumonia is a lung infection. Symptoms include fever, chills, sweats, cough, pain with breathing or coughing, and shortness of breath. You might also have a headache or feel tired. You might not feel like eating. Contact your prescriber right away if you have these symptoms.

If you have pneumonia, you will take one or two antibiotics. Your prescriber or pharmacist can fill in the antibiotic names, doses, and directions for you below. You will be taking:

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Start taking the antibiotic as soon as possible. Don't miss doses. Ask what to do if you miss a dose.

Take the antibiotic until it is gone, even if you feel better. Your prescriber will probably want you to take your other medications as usual. If you have a chronic disease like diabetes, or lung or heart disease, keep it under good control.

Your prescriber might also want you to:

- Drink fluids to avoid dehydration.
- Avoid alcohol and cough and cold medicines.
- Take deep breaths and cough at least each hour.
- Use a humidifier to make warm, moist air.
- Avoid smoking.
- Rest. If resting in bed, turn over or get up at least every hour while awake.
- Take acetaminophen (*Tylenol*, others), ibuprofen (*Motrin IB*, others), or naproxen (*Aleve*, others) for fever or pain.

If any of these things happen, call your prescriber at \_\_\_\_\_. If you cannot reach him or her, get medical attention right away.

- New or worsening shortness of breath.
- New or worsening pain with breathing or coughing.
- Chest pain.
- Confusion.
- Blue lips.
- You cough up bloody or rust-colored mucus.
- Shaking chills, night sweats, or fever that is new, worsens, or doesn't improve.

Follow up with your prescriber on \_\_\_\_\_.

To prevent future episodes of pneumonia, you should:

- Get a flu shot every year.
- Ask your prescriber if a pneumonia shot is right for you.
- If you smoke, quit.
- Stay healthy. Get lung disease, heart disease, and diabetes under control.
- Wash your hands often. Practice good hygiene.

*[This handout may not cover all possible information. It does not replace the need for professional medical care. Always follow the instructions from your healthcare provider.]* [November 2013 (last reviewed November 2019); 291205]