Evidence-Based Management of Acute Respiratory Tract Infections

Repeated studies and meta-analyses have demonstrated no significant benefit from antibiotics in otherwise healthy persons. Antibiotic administration is associated with allergic reactions, C. difficile infection and future antibiotic resistance in the treated patient and the community.


In the absence of pneumonia, consider the following diagnoses for adults with acute cough illness.

**Acute Bronchitis**
- De Criteria:
  - Cough dominant
  - +/- phlegm
  - Rhonchi/hild wheezing common

**URI or Rhinosinusitis**
- De Criteria:
  - Cough plus nasal, throat and/or ear symptoms
  - No-dominant symptoms

**Influenza During the Season**
- De Criteria:
  - If cough + fever + myalgias + fatigue present, prevalence > 60%

**Acute Bacterial Sinusitis**
- De Criteria:
  - See reverse side of brochure

**Antibiotics NOT NEEDED**

See reverse for recommendations on antibiotic therapy.

Educate and Advise Patients

Most patients want a diagnosis, not necessarily antibiotics. Explain to the patient that most bronchitis is a viral illness, and coughs are either viral or reactive airway disease. It is important to emphasize that antibiotics may have serious side effects and may create resistance to antibiotics in the patient or their family. This strategy is associated with equal or superior patient satisfaction. Set appropriate expectations for the duration of symptoms, e.g., cough may last for up to four weeks. Give symptomatic relief such as codeine-based cough suppressants, NSAIDS, multi-symptom OTC medications, and possibly bronchodilators if there is any bronchospasm. Caution patients regarding symptoms (such as high fevers and shortness of breath) that indicate more severe disease.

Recommended Vaccination

- Influenza vaccination for all persons ≥6 months of age, particularly older and younger patients and those with concurrent significant illnesses.
- Pneumococcal vaccination for those with concurrent significant illnesses and all persons ≥65 years old without a pneumococcal vaccine history. Refer to the CMA Foundation’s Adult Vaccine Schedule for recommended intervals between the pneumococcal conjugate vaccine (PCV13) and pneumococcal polysaccharide vaccine (PPV23).
- Pertussis immunization for all pregnant women of any age with each pregnancy, between 27 and 36 weeks (but CAN be given at any time). Prompt vaccination is recommended for those who have or will have close contact with an infant <12 months of age (e.g., parents, grandparents, childcare providers, and healthcare practitioners). For all others vaccinate once during the routine every-10-year tetanus booster.

FOR MORE INFORMATION OR ADDITIONAL MATERIALS, VISIT WWW.AWARE.MD.
When NOT to Treat with an Antibiotic:

Otitis Media

- More than 2 episodes in the last 6 months
- Malignant otitis externa
- Unclear etiology

Acute Otitis Media (AOM)

When to Treat with an Antibiotic:

> 90% of cases caused by routine respiratory viruses

> 95% of cases caused by Bordetella pertussis, Chlamydia pneumoniae, or Mycoplasma pneumoniae

> 200 viruses, including rhinoviruses, coronaviruses, adenoviruses, respiratory syncytial virus, enteroviruses (coxsackieviruses and echoviruses), influenza viruses and parainfluenza viruses

Mainly viral pathogens

Streptococcus pneumoniae
Hemophilus influenzae
Moraxella catarrhalis

Antibiotic Choice:

- Amoxicillin
- Clindamycin

Antibiotic Duration:

- Amoxicillin: 5-10 days
- Clindamycin: 7-14 days for amoxicillin

Antibiotics are generally not indicated.

Antibiotics are indicated.

When NOT to Treat with an Antibiotic:

Polyradiculoneuropathy:

- Nonspecific cough illness
- Nonspecific URI
- Bronchiolitis

Antibiotic Choice:

- None

Antibiotic Duration:

- None

Antibiotic Failure:

- None

Pharyngitis

When NOT to Treat with an Antibiotic:

Most pharyngeal cases are viral in origin. The presence of the following is uncommon with Group A Strep, and point away from using antibiotics: conjunctivitis, cough, rhinorrhea.

Acute Bacterial Sinusitis

When NOT to Treat with an Antibiotic:

When NOT to Treat with a URI:

- Nonspecific cough illnesses
- Bronchiolitis

Antibiotic Choice:

- None

Antibiotic Duration:

- None

Antibiotic Failure:

- None

Skin and Soft Tissue Infections

When NOT to Treat with an Antibiotic:

Cellulitis is almost always secondary to staphylococcal species. Treatment can be directed normally.

Acne rosacea are often secondarily to Staphylococcus aureus – including methicillin-resistant Staphylococcus aureus (MRSA). The treatment is primarily drainage and this is required for larger abscesses. If surrounding cellulitis, treatment should be broadened to cover MRSA. Cultures should be obtained.

Streptococcus pneumoniae
Staphylococcus aureus (methicillin-sensitive and methicillin-resistant)

Indicated

Isolation and drainage

If significant abscess collections, add antibiotics

Antibiotic Duration:

- Duration 5-10 days

Urinary Tract Infection

When NOT to Treat with an Antibiotic:

- Most children with urinary tract infections (UTIs) are female. Empiric therapy for UTI may be given when urinalysis demonstrates pyuria (leukocytes and red blood cells) and >5 white blood cells (WBCs) per high power field (25 WBCs per field) and urine culture obtained through catheterization or suprapubic aspiration. A positive culture consists of >50,000 colony-forming units (CFUs) per ml of a uropathogen.

- >50% UTIs caused by Escherichia coli. Other gram-negative organisms may cause infection including Klebsiella, Proteus and Pseudomonas. Gram-positive pathogens include Enterococcus and group B Streptococcus, as well as Staphylococcus in neonatal girls.

Antibiotic Choice:

- Cefazolin, piperacillin, cefotaxime, ceftiraxone, cefepime, amoxicillin-clavulanate, trimethoprim-sulfamethoxazole.

Antibiotic Duration:

- 7-14 days

Antibiotic Choice:

- Piperacillin/tazobactam, linezolid, ciprofloxacin.

Antibiotic Failure:

- Recommand follow-up with primary care provider to obtain ultrasonogram of kidneys and bladder as soon as urine tract infection is confirmed.

Antibiotic Failure:

- Follow-up urine culture and adjust antibiotic therapy according to sensitivities.

Antibiotic Failure:

- Continue empirical antibiotic therapy.
Confirm a Streptococcal Cause of Pharyngitis BEFORE Prescribing Antibiotics.

**Clinical signs and symptoms that strongly suggest a non-streptococcal (usually viral) etiology:**
- Cough
- Rhinorrhea
- Oral ulcers/Haemorrhages

**Clinical signs and symptoms that increase the probability of strep pharyngitis:**
- Pharyngeal or tonsillar swelling
- Erythema and exudate
- Lymphadenopathy

The signs and symptoms of streptococcal and nonstreptococcal pharyngitis overlap too broadly for diagnosis to be made on clinical grounds alone. Laboratory confirmation of the diagnosis is necessary.

### Support for Diagnostics

- Group A Strept (GAS) testing
- Positive rapid antigen detection test
- Positive STREP CULTURE

Educate, Advise and Assist Patients and Parents/Caregivers.

**Viruses:** If rapid strep testing is negative, educate parents and patients/caregivers that the cause (pending possible cultures) is not strep but one of many different viruses, and antibiotics are not necessary. Even with typical symptoms, fewer than 30% of children have strep pharyngitis. Inform parent/caregivers that prior, repeated, or recent strep infection or exposure to someone with strep increases the probability of strep pharyngitis:

- Pharyngeal or tonsillar swelling
- Erythema and exudate

**Signs of worsening:** Educate patients and parents/caregivers that, occasionally, whatever the cause of a sore throat and whether antibiotics are prescribed or not, symptoms can worsen. If this is the case, re-evaluation is necessary. If symptoms do not begin to subside in 72 hours, schedule a re-evaluation for further evaluation.

**Illness prevention:** Review illness prevention, including good hand and respiratory hygiene. Offer influenza vaccination to children 6 months to 18 years of age. Encourage parents/caregivers and household contacts of children to get vaccinated.

### Reference Articles

**Guideline Summary**


**Reference Articles**

1. Lieberthal AS et al. The Diagnosis and Management of Acute Otitis Media.

**Acute Infection Guideline Summary**

2. CMA PHC, 1201 K Street, #800, Sacramento, CA 95814.

**Supporting Organizations**

- Alameda Alliance for Health
- Anthem Blue Cross
- Joint Health Plan
- HealthNet of California

**Endorsing Organizations**

- American Academy of Pediatrics, California Chapter
- California Academy of Family Physicians
- California Pharmacists Association
- Urgent Care Association of America
- Urgent Care College of Physicians

**FOR MORE INFORMATION OR ADDITIONAL MATERIALS, VISIT WWW.AWARE.MD.**
Feel Better Soon... Without Antibiotics!

Frequently Asked Questions: Viruses & Antibiotics

What are viruses?
Viruses are germs that can cause infections such as a cold, the flu, and bronchitis. A virus can travel through the air or on your hands and enter your hands when a sick person coughs or sneezes. Your body will try to fight and kill the virus. Getting the flu vaccine can help your body fight the flu. If your body can’t kill the virus, then you will start to feel sick in 1-2 days.

What are antibiotics?
Antibiotics are medications that treat infections caused by bacteria. Antibiotics do not kill viruses! Antibiotics do not cure or decrease cold and flu symptoms. Instead, overuse can lead to “antibiotic resistance.”

What is antibiotic resistance?
Antibiotic resistance happens when antibiotics lose their power to kill bacteria. This happens when we use antibiotics that are not needed or do not take them exactly as prescribed.

Prevent antibiotic resistance now!
Take antibiotics ONLY when prescribed by your doctor. NEVER share antibiotics or take leftovers. Take ALL your antibiotics when prescribed, even if you start to feel better. Finish ALL your pills and do not save antibiotics.

When will my doctor prescribe antibiotics?
Your doctor, nurse practitioner or physician assistant will evaluate your illness and may do extra lab tests to see if an antibiotic is necessary. If your doctor thinks that you have the flu, he/she may prescribe an antiviral.

For More Information
Alliance Working for Antibiotic Resistance Education: www.aware.md
Centers for Disease Control & Prevention: www.cdc.gov/getsmart
American Board of Internal Medicine Foundation: www.choosingwisely.org

Stay Healthy!
1. Wash your hands often to prevent the spread of germs.
2. Get the flu and pneumococcal vaccines.
3. Exercise regularly.
4. Eat healthy foods.
5. Get plenty of sleep at night.
The common cold, flu, and most bronchitis are caused by viruses.

**Antibiotics do not kill viruses.**

Here are some options that may help you feel better...

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<tr>
<th>Symptoms</th>
<th>Home Remedies</th>
<th>Over-the-Counter*</th>
<th>Active Ingredient</th>
<th>Common Brand Names**</th>
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<td>Stuffy Nose</td>
<td>• Use a room humidifier</td>
<td>Decongestant: opens up the nasal passages</td>
<td>Oxymetazoline</td>
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<td></td>
<td>• Salt water nose drops or spray</td>
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<td>Neo-Synephrine, Sudafed PE®</td>
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<td>• Use tissue with lotion</td>
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<td>Robitussin Chest Congestion®, Mucinex®</td>
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*Talk to your doctor or a pharmacist if you are pregnant, breastfeeding, or taking other medications before taking over-the-counter medications. Consult your doctor for symptom relief.

**Brand names are listed as examples and do not imply endorsement. (Also look for generic store brands.)
Frequently Asked Questions: Viruses & Antibiotics

What are viruses?
Viruses are germs that can cause infections such as a cold, the flu, and bronchitis. A virus can travel through the air or on your hands and enter your hands when a sick person coughs or sneezes. Your body will try to fight and kill the virus. Getting the flu vaccine can help your body fight the flu. If your body can’t kill the virus, then you will start to feel sick in 1-2 days.

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What is antibiotic resistance?
Antibiotic resistance happens when antibiotics lose their power to kill bacteria. This happens when we use antibiotics that are not needed or do not take them exactly as prescribed.

Prevent antibiotic resistance now!
Give your child antibiotics ONLY when prescribed by his or her doctor. NEVER share your child’s antibiotics or give your child leftovers. Give ALL your child’s antibiotic prescription to him or her, even if your child starts to feel better. Finish ALL of the medication and do not save unfinished antibiotics for future use.

When will my doctor prescribe antibiotics?
Your child’s doctor, nurse practitioner or physician assistant will evaluate your child’s illness and may do extra lab tests to see if an antibiotic is necessary. If your child’s doctor thinks that your child has the flu he/she may prescribe an antiviral.

For More Information
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We would like to thank the Washington State Department of Health for allowing us to adapt this publication.
Just because you have a cough or bronchitis, does NOT mean you need an antibiotic. Here is why your doctor MAY NOT prescribe antibiotics for you:

More than 90% of coughs (including bronchitis) in adults are caused by VIRUSES. Antibiotics do not kill viruses. Your body will kill the viruses on its own. The cough can last for a few weeks even after the infection is gone.

Taking unnecessary antibiotics may lead to harmful side effects and future antibiotic-resistant infections. You can do something to FEEL better in the meantime.

You CAN:

- Take medicine like acetaminophen (Tylenol®) or ibuprofen (Advil® and Motrin®) for throat pain, headache and/or fever as directed by your doctor.

- Take over-the-counter cough medicines at night to help you sleep. These may make you sleepy or jittery if you take them during the day.

- You should NEVER use someone else’s inhaler or medicine. Sometimes when your doctor thinks it will help, he or she may prescribe an inhaler for your cough. This should only be used as directed by your doctor! NEVER use leftover antibiotics, yours or anyone else’s.

- Drink extra water, juice and clear soups.

- Get plenty of rest.

- Cover your nose and mouth with a tissue when you cough.

- Wash your hands often with soap and warm water or alcohol-based hand gels.

**Contact your physician if your symptoms are not improving or worsen.**
Bronchitis, Colds and Other Cough Illnesses in Children

Just because your child has a cough or bronchitis, does NOT mean he or she needs antibiotics. Here is why your doctor MAY NOT prescribe antibiotics for your child:

More than 90% of coughs (including bronchitis) in children are caused by VIRUSES. Antibiotics do not kill VIRUSES. Your body will kill the viruses on its own. The cough can last for a few weeks even after the infection is gone.

You can help your child FEEL better in the meantime.

You CAN:

• Give extra water, juice and clear soups to your child.
• Teach your child how to gargle with warm water and salt. Make sure the water is not too hot.
• Limit your child’s activity and encourage him or her to rest.
• Apply a cool compress over your child’s forehead if he or she has a fever. Use a vaporizer (humidifier) to reduce your child’s cough during the night.
• Give children’s acetaminophen (like Children’s Tylenol®) or children’s ibuprofen (like Children’s Advil® and Children’s Motrin®) for throat pain, headache and/or fever as directed by your or pharmacist. Follow the dosing instructions on the package. Do NOT give your child aspirin.
• Do NOT use someone else’s inhaler or medicine for your child. Sometimes when your doctor thinks it will help, he or she may prescribe an inhaler for your child’s cough. This should only be used as directed by your doctor!
• Have your child cover their mouth and nose with a tissue when they cough.
• Encourage your child to wash their hands often with soap and warm water or alcohol-based gels.
• NEVER give your child leftover antibiotics, prescribed to him or her or anyone else.
• Over-the-counter cough and cold medications are not recommended for infants and children less than 2 years of age. For children over 2 years of age follow dosing instructions on package.

Remember to give lots of love and hugs to your child!
RELIEF FOR A COLD OR THE FLU

Most upper respiratory infections are caused by a virus. Antibiotics do not work against a virus.

Name: _________________________________________________
Date: __________________________________________________
Diagnosis: ______________________________________________

RX: CARE YOU CAN DO AT HOME
• Drink more water, juice or soup.
• Get plenty of rest.
• Stay away from cigarette smoke.
• Use saline nose drops or spray.
• For sore throats, gargle with warm salt water.
• Take medicines as prescribed.

RX: TO AVOID A COLD OR THE FLU
• Wash your hands.
• Avoid touching eyes and nose.
• Get flu shots just before flu season.
• Stay away from cigarette smoke.
• Avoid crowds during cold and flu season.
• Clean tables and counters at least once every day.

Medicines and other treatment you may use with instructions:

<table>
<thead>
<tr>
<th>Medicine/Treatment</th>
<th>Instructions</th>
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If you have not improved in _______ days, please call or schedule a return visit to the doctor’s office. Remember, a cough can last _______ weeks, even after the infection is gone.

Signature: ______________________________  Phone number: __________________________