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. 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.

Supporting Organizations

- Alameda Alliance for Health
- Anthem Blue Cross
- Health Net of California
- L.A. Care Health Plan
- Molina Healthcare of California
- Urgent Care College of Physicians
- Urgent Care Association of America
- Infectious Diseases Society of America / American Thoracic Society (IDSA/ATS)
- American College of Physicians (ACP)
- American Academy of Otolaryngology – Head and Neck Surgery
- American Academy of Family Physicians (AAFP)
- American Academy of Allergy, Asthma & Immunology (AAAAI)

Guidelines Reviewed:

- Drugs for Community-Acquired Bacterial Pneumonia. Med Lett Drugs Ther. 2007;49(1266):62-64.

Non-specific URI:


Acute Bacterial Sinusitis:


Pharyngitis:


Non-specific Cough Illnesses/Acute Bronchitis/Pertussis:


Cellulitis and Abscesses:


Guidelines Reviewed:

- American Academy of Allergy, Asthma & Immunology (AAAAI)
- American Academy of Family Physicians (AAFP)
- American Academy of Otolaryngology – Head and Neck Surgery
- American College of Physicians (ACP)
- Centers for Disease Control and Prevention (CDC)
- Infectious Diseases Society of America (IDSA)
- Institute for Clinical Systems Improvement (ICSI)
- Infectious Diseases Society of America / American Thoracic Society (IDSA/ATS)

FOR MORE INFORMATION OR ADDITIONAL MATERIALS, VISIT WWW.AWARE.MD.

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### Outpatient Community Acquired Pneumonia

<table>
<thead>
<tr>
<th>Illness</th>
<th>Indications for Antibiotic Treatment in Adults</th>
<th>Pathogen</th>
<th>Antibiotic Choice</th>
<th>Guidelines Reviewed</th>
</tr>
</thead>
<tbody>
<tr>
<td>When NOT to Treat with an Antibiotic as an Outpatient</td>
<td>Consider outpatient admission if PSI score &gt;90, CURB-65 &gt;2, unable to tolerate oral, unstatable situation, or if clinical judgment indicates.</td>
<td>Streptococcus pneumoniae</td>
<td>Macrolide* (e.g., azithromycin, clarithromycin)</td>
<td>IDSA, ATS, ICSI</td>
</tr>
<tr>
<td>When to Treat with an Antibiotic as an Outpatient</td>
<td>Perform chest x-ray (CXR) to confirm the diagnosis of pneumonia. Evaluate for outpatient management. Consider pre-existing conditions, calculate Pneumonia Severity Index (PSI) ≤30 for outpatient management or CURB-65 ≤5 for 1 hr outpatient management. Visit <a href="http://www.idsoc.org">www.idsoc.org</a> for more information.</td>
<td>Mycoplasma pneumoniae</td>
<td>Doxycycline</td>
<td>IDSA, ATS, ICSI</td>
</tr>
</tbody>
</table>

### Acute Bacterial Sinusitis

<table>
<thead>
<tr>
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<tr>
<td>When NOT to Treat with an Antibiotic</td>
<td>Nearly all cases of acute sinusitis resolve without antibiotics. Antibiotic use should be reserved for moderate symptoms that are not improving after 10 days, or that are worsening after 5-7 days, and severe symptoms.</td>
<td>Streptococcus pneumoniae</td>
<td>Not indicated</td>
<td>AAFP, ACP, CDC, IDSA</td>
</tr>
<tr>
<td>When to Treat with an Antibiotic</td>
<td>Diagnosis of acute bacterial sinusitis may be made in adults with symptoms of acute rhinosinusitis (nasal obstruction or purulent discharge, facial fullness or pain, fever, or anorexia) who have any of the following clinical presentations: Symptoms lasting &gt;10 days without clinical improvement. Severe illness with high fever (&gt;39°C [102°F]) and purulent nasal discharge or facial pain for &gt;3 consecutive days at the beginning of illness. Worsening symptoms or signs (new onset fever, headache or increase in nasal discharge) following typical URI that lasted 5-6 days and were initially improving.</td>
<td>Sinusitus</td>
<td>Not indicated</td>
<td>AAFP, ACP, CDC, IDSA</td>
</tr>
</tbody>
</table>

### Urinary Tract Infection

<table>
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<tr>
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<th>Antibiotic Choice</th>
<th>Guidelines Reviewed</th>
</tr>
</thead>
<tbody>
<tr>
<td>When NOT to Treat with a Urinary Antimicrobial Therapy</td>
<td>The patient has not recently received an antimicrobial agent.</td>
<td>Enterococcus</td>
<td>Not indicated</td>
<td>AAFP, ACP, CDC, IDSA</td>
</tr>
<tr>
<td>When to Treat with an Antibiotic</td>
<td>Many patients with suspected UTI will improve on hydration and without further treatment. Depending on the patient’s presentation, pathogen identification and antimicrobial susceptibility pattern, empirical therapy may be given.</td>
<td>Chlamydophila pneumoniae</td>
<td>Doxycycline</td>
<td>AAFP, ACP, CDC, IDSA</td>
</tr>
<tr>
<td>When NOT to Treat with an Antibiotic as an Outpatient</td>
<td>Older (≥70 years), immunocompromised, pregnant, or severe symptoms.</td>
<td>Ureaplasma urealyticum</td>
<td>Not indicated</td>
<td>AAFP, ACP, CDC, IDSA</td>
</tr>
<tr>
<td>When to Treat with an Antibiotic as an Outpatient</td>
<td>Specific case scenarios: Bacteriuria and pyuria (positive leukocyte esterase test) or ≥10 white blood cells (WBCs) per high-power field (≥100 WBCs per mL), or urine culture obtained through catheterization or suprapubic aspiration. A positive culture consists of ≥10^4 colony-forming units (CFUs) per mL of a uropathogen. In patients suspected of pyelonephritis, always confirm diagnosis with urine culture and susceptibility testing before using antibiotics.</td>
<td>Azotobacter vinelandii</td>
<td>Not indicated</td>
<td>AAFP, ACP, CDC, IDSA</td>
</tr>
</tbody>
</table>

*Macrolides and quinolones cause QT prolongation and have an increased risk of cardiac death. Reserve the use of quinolones when treating acute bacterial sinusitis, acute bacterial exacerbation of chronic bronchitis, and uncomplicated urinary tract infections for patients who do not have alternative treatment options.*

This guideline summary is intended for physicians and healthcare professionals to consider in managing the care of their patients for acute infections. While the summary describes recommended courses of intervention it is not intended as a substitute for the advice of a physician or other knowledgeable health care professional. These guidelines represent best clinical practice at the time of publication, but practice standards may change as knowledge is gained.
Perform throat culture

NO ANTIBIOTIC NEEDED

FOR MORE INFORMATION OR ADDITIONAL MATERIALS, VISIT WWW.AWARE.MD.
This guideline summary is intended for physicians and healthcare professionals to consider in managing the care of their patients for acute infections. While the summary describes recommended courses of intervention, it is not intended as a substitute for the advice of a physician or other knowledgeable health care professional. These guidelines represent best clinical practice at the time of publication, but practice standards may change as knowledge is gained.

**Non-specific Cough Illness**

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<tr>
<th>Clinical Presentation</th>
<th>When to Treat with an Antibiotic</th>
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</thead>
<tbody>
<tr>
<td>&gt;50% of cases caused by respiratory viruses</td>
<td>No antibiotic treatment recommended</td>
</tr>
</tbody>
</table>

**Sinusitis**

- When NOT to Treat with an Antibiotic: Nearly all cases of acute sinusitis resolve without antibiotics.
- Antibiotic use should be reserved for moderate symptoms not improving after 10 days, or if worsening after 5-6 days or development of complications.

**Pharyngitis**

- When NOT to Treat with an Antibiotic: The most pharyngitis cases are viral in origin. The presence of pharyngitis with unimpaired ADAMs (African-American descent and Mexican-American descent) and point away from using antibiotics: conjunctivitis, cough, rhinorrhea, and diarrhea.
- Confirm diagnosis with throat culture or rapid antigen detection. If rapid antigen detection is negative, obtain throat culture.

**Acute Bacterial Sinusitis**

- When NOT to Treat with an Antibiotic: Abscesses are often secondary to sinusitis and require appropriate drainage and antibiotic therapy.

**Urticarial Infection**

- When NOT to Treat with an Antibiotic: Most children with urticarial infections (fits) are febrile. Empiric therapy for UTI may be given when urticaria is due to serous (uncomplicated) pyogenic pharyngitis or in the presence of significant respiratory symptoms or obstructive jaundice.

**Otitis Media**

- When NOT to Treat with an Antibiotic: Abscesses are often secondary to urticarial infections - in the absence of marked obstructive jaundice.

**Bacterial Septicemia**

- When NOT to Treat with an Antibiotic: When septicemia is suspected, appropriate laboratory diagnosis and treatment should be initiated immediately.

**Pharyngitis**

- When NOT to Treat with an Antibiotic: Group G streptococcus pharyngitis is not indicated in children <3 years of age, as the incidence of streptococcal pharyngitis and the classic presentation of streptococcal pharyngitis are uncommon in this age group.

**Sinusitis**

- When NOT to Treat with an Antibiotic: Nearly all cases of acute sinusitis resolve without antibiotics.
- Antibiotic use should be reserved for moderate symptoms not improving after 10 days, or if worsening after 5-6 days or development of complications.

**Pharyngitis**

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- When NOT to Treat with an Antibiotic: Abscesses are often secondary to sinusitis and require appropriate drainage and antibiotic therapy.

**Pharyngitis**

- When NOT to Treat with an Antibiotic: The most pharyngitis cases are viral in origin. The presence of pharyngitis with unimpaired ADAMs (African-American descent and Mexican-American descent) and point away from using antibiotics: conjunctivitis, cough, rhinorrhea, and diarrhea.
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.

Stay Healthy!

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

Feel Better Soon... Without Antibiotics!
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...

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Home Remedies</th>
<th>Over-the-Counter*</th>
<th>Active Ingredient</th>
<th>Common Brand Names**</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>All Colds and Viral Infections</strong></td>
<td>• Drink plenty of fluids (like water and clear soup)</td>
<td></td>
<td>Oxymetazoline</td>
<td>Afrin®</td>
</tr>
<tr>
<td></td>
<td>• Stay home and rest</td>
<td></td>
<td>Phenylephrine</td>
<td>Neo-Synephrine, Sudafed PE®</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pseudoephedrine</td>
<td>Sudafed®</td>
</tr>
<tr>
<td><strong>Stuffy Nose</strong></td>
<td>• Use a room humidifier</td>
<td>Decongestant:</td>
<td>Diphenhydramine</td>
<td>Benadryl®</td>
</tr>
<tr>
<td></td>
<td>• Salt water nose drops or spray</td>
<td>opens up the nasal passages</td>
<td>Chlorpheniramine</td>
<td>Chlor-Trimeton®</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Loratadine</td>
<td>Claritin®, Alavert®</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Clemastine</td>
<td>Tavist Allergy®</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>Cetirizine</td>
<td>Zyrtec®</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fexofenadine</td>
<td>Allegra®</td>
</tr>
<tr>
<td></td>
<td>• For red, raw nose, put petroleum jelly or salve on the exterior</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Use tissue with lotion</td>
<td>Antihistamine:</td>
<td>Diphenhydramine</td>
<td>Benadryl®</td>
</tr>
<tr>
<td></td>
<td></td>
<td>dries up the mucus</td>
<td>Chlorpheniramine</td>
<td>Chlor-Trimeton®</td>
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<td></td>
<td></td>
<td>Fexofenadine</td>
<td>Allegra®</td>
</tr>
<tr>
<td><strong>Dry Cough</strong></td>
<td>• Use a room humidifier</td>
<td>Cough suppressant:</td>
<td>Dextromethorphan</td>
<td>Delsym®</td>
</tr>
<tr>
<td></td>
<td>• Gargle with warm salt water</td>
<td>helps stop cough</td>
<td></td>
<td></td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Moist Cough</strong></td>
<td>• Drink more fluids</td>
<td>Expectorant:</td>
<td>Guaiifenesin</td>
<td>Robitussin Chest Congestion®, Mucinex®</td>
</tr>
<tr>
<td></td>
<td></td>
<td>thins mucus,</td>
<td>Guaiifenesin w/ dextromethorphan</td>
<td>Robitussin DM®, Mucinex DM®</td>
</tr>
<tr>
<td></td>
<td></td>
<td>makes it easier to cough up</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sore Throat</strong></td>
<td>• Gargle with warm salt water</td>
<td>Throat lozenges:</td>
<td>Menthol</td>
<td>Halls®, Vicks®, Luden’s®, Cepacol®, Chloraseptic®</td>
</tr>
<tr>
<td></td>
<td>• Avoid smoke</td>
<td>soothes throat</td>
<td>Benzocaine</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Drink tea</td>
<td>(Do not give to children younger than 10 years of age.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fever / Muscle Aches</strong></td>
<td>• Cool compress on the forehead</td>
<td>Analgesic: pain</td>
<td>Acetaminophen</td>
<td>Tylenol®</td>
</tr>
<tr>
<td></td>
<td>• Warm compress on sore muscles</td>
<td>reliever</td>
<td>Aspirin (adults over 20)</td>
<td>Anacin®, Bayer®, Bufferin®, Ecotrin®</td>
</tr>
<tr>
<td></td>
<td>• Bed rest</td>
<td></td>
<td>Ibuprofen</td>
<td>Advil®, Motrin IB®, Nuprin®, Aleve®</td>
</tr>
<tr>
<td><strong>Itchy, Watery Eyes / Sneezing</strong></td>
<td>• Avoid things you are allergic to or that cause irritation</td>
<td>Antihistamine:</td>
<td>Diphenhydramine</td>
<td>Benadryl®</td>
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<td>may relieve itchy eyes</td>
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<td><strong>Ear Ache</strong></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Naproxen</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.)

We would like to thank the Washington State Department of Health for allowing us to adapt this publication.
**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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 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!**
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.

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**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.

**Feel Better Soon... Without Antibiotics!**

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**For More Information**
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• Stay home and rest                  | Over-the-counter cough and cold medications are not recommended for infants and children under 6 years of age. For children over 6 years of age follow dosing instructions. |                    |                      |
| Stuffy Nose                     | • Use a room humidifier                             
• Salt water nose drops or spray       |                    | Menthol           | Halls®, Vicks®, Luden’s®, Cepacol®, Chloraseptic® |
| Runny Nose                      | • For red, raw nose, put petroleum jelly or salve on the exterior  
• Use tissue with lotion              |                    | Acetaminophen     | Tylenol®, Advil®, Motrin IB®, Naprin®, Aleve® |
| Dry Cough                       | • Use a room humidifier                             
• Gargle with warm salt water         |                    | Ibuprofen         |                      |
| Moist Cough                     | • Drink more fluids                                 |                    | Naproxen          |                      |
| Sore Throat                     | • Gargle with warm salt water                       
• Avoid smoke                        
• Drink tea                           |                    | Fever-reducing pain reliever |                      |
| Fever / Muscle Aches            | • Cool compress                                     
• Warm compress on sore muscles       
• Bed rest                            |                    | Acetaminophen     | Tylenol®, Advil®, Motrin IB®, Naprin®, Aleve® |
| Itchy, Watery Eyes / Sneezing   | • Avoid things you are allergic to or that cause irritation |                    | Fever-reducing pain reliever |                      |
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**Brand names are listed as examples and do not imply endorsement. (Also look for generic store brands.)
Bronchitis, Colds and Other Cough Illnesses in Adults

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.

Visit our website at: www.aware.md
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:

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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: __________________________