EC HO: Management of URIs

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Infectious causes of URIs change over time

The Dynamics of Upper Respiratory Tract Infections

- Viruses
  - Direct Synergy
  - Anatomy
  - Immunity
  - Adherence
  - Paralysis Cilia

- Aerobic Bacteria
  - Streptococcus pneumoniae
  - Haemophilus influenzae
  - Moraxella catarrhalis
  - Others

- Anaerobic Bacteria
  - Prevotella
  - Fusobacteria
  - Peptostreptococcus

Time

Brook, 1995.
Most ARIls are viral with no need for an antibiotic

<table>
<thead>
<tr>
<th>Condition</th>
<th>Usual Cause</th>
<th>Antibiotic Treatment Recommendations</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Viruses</td>
<td>Bacteria</td>
</tr>
<tr>
<td>Pharyngitis</td>
<td>✔ ✔ ✔ ✔ ✔ ✔</td>
<td>✔</td>
</tr>
<tr>
<td>Sinusitis</td>
<td>✔ ✔ ✔ ✔ ✔ ✔</td>
<td>✔</td>
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<tr>
<td>Uncomplicated bronchitis</td>
<td>✔ ✔ ✔ ✔ ✔ ✔</td>
<td>✔</td>
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<tr>
<td>Common Cold</td>
<td>✔ ✔ ✔ ✔ ✔ ✔</td>
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## Common Cold

<table>
<thead>
<tr>
<th>Key Symptoms</th>
<th>Key Clinical Findings</th>
<th>Antibiotic Treatment Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Runny nose, cough, sore throat, sneezing, nasal congestion</td>
<td>Differentiate from acute bacterial sinusitis</td>
<td>Antibiotics not recommended for any patient</td>
</tr>
</tbody>
</table>
## Sinusitis

<table>
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<th>Key Symptoms</th>
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| Nasal obstruction, anterior or posterior purulent nasal discharge, facial pain, cough, decreased sense of smell | **Criteria for Bacterial Sinusitis:**  
**Persistent** and not improving (≥10 days)  
**Worsening** (new onset fever, nasal discharge or cough after initial improvement or “double-sickening”)  
**Severe** symptoms or febrile (>102°F) with purulent nasal discharge or pain lasting ≥3 days | Antibiotics may be indicated if clinical criteria are met for bacterial sinusitis |
Antibiotics indicated for either symptoms for > 10 days, or severe symptoms with purulent nasal drainage and fever, or worsening symptoms after initial improvement

Empiric treatment suggestion

1. **Augmentin**/high dose in adults
2. **Doxycycline** if PCN allergic. Give 200mg initial loading dose to get effective blood levels
3. **Levofloxacin** only as alternative

Do not use azithromycin given high incidence of resistant strep pneumoniae

Recommended duration of therapy 5 to 7 days; do not use more than 5 days of levofloxacin
S. Pneumoniae resistance to Azithromycin is a major concern when using it as monotherapy.
## Pharyngitis

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<tbody>
<tr>
<td>Sore throat with or without other upper upper respiratory tract symptoms</td>
<td>Test for Group A <em>Streptococcus</em> if three of the following are present:</td>
<td>Antibiotics recommended only if Group A <em>Streptococcus</em> test or culture is positive</td>
</tr>
<tr>
<td></td>
<td>• Fever</td>
<td></td>
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<tr>
<td></td>
<td>• Swollen cervical lymphadenopathy</td>
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</tr>
<tr>
<td></td>
<td>• Tonsillar exudate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Absence of cough</td>
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</table>
Using this checklist can help you accurately diagnose or rule-out Strep throat.

**Signs and Symptoms of Strep Throat**

**Usually include:**
- Sore throat starts quickly
- Pain when swallowing
- Fever
- Red and swollen tonsils, sometimes with white patches or streaks of pus
- Tiny red spots on the roof of the mouth
- Swollen lymph nodes in the front of the neck

**Typically do not include:**
- Cough
- Runny nose
- Hoarseness
- Conjunctivitis (pink eye)
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<td>Cough, possible phlegm production</td>
<td>Differentiate from severe illness: pneumonia (abnormal vital signs, focal lung consolidation), pertussis (confirmed exposure or positive test), influenza (high fever, myalgias)</td>
<td>Antibiotics not recommended; Cough duration or change in sputum color is not indicative of bacterial infection</td>
</tr>
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</table>
Objective To evaluate the efficacy of oral anti-inflammatory or antibiotic treatment compared with placebo in the resolution of cough in patients with uncomplicated acute bronchitis and discolored sputum.

Design Multicenter, parallel, single blinded placebo controlled, randomized clinical trial.

Setting Nine primary care centers

Participants: Adults aged 18 to 70 with presenting symptoms associated with respiratory tract infection of less than one week's duration, with cough as the predominant symptom, the presence of discolored sputum, and at least one other symptom of lower respiratory tract infection (dyspnea, wheezing, chest discomfort, or chest pain).

Interventions Patients were randomized to receive either ibuprofen 600 mg three times daily, amoxicillin-clavulanic acid 500 mg/125 mg three times daily, or placebo three times daily for 10 days. The duration of symptoms was measured with a diary card.

Main outcome measure Number of days with frequent cough after the randomization visit.
Fig 2 Kaplan-Meier survival analysis of days with frequent cough—that is, time (days) with cough from baseline visit until patient last scored ≥1 for both daytime and night time cough.

<table>
<thead>
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<th>Number at risk</th>
<th>Days</th>
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<tr>
<td>Amoxicillin-clavulanic acid</td>
<td>124 112 67 25 11 6 3</td>
</tr>
<tr>
<td>Ibuprofen</td>
<td>130 113 59 19 8 3 0</td>
</tr>
<tr>
<td>Placebo</td>
<td>136 125 70 37 18 3 1</td>
</tr>
</tbody>
</table>

Log rank test = 0.25

Carl Lior et al. BMJ 2013;347:bmj.f5762
When should you consider CXR and antibiotics in a patient with possible acute bronchitis? Appropriate if any SIRS criteria are present or patient has exacerbation of chronic bronchitis.

### Table 1. Indications for Chest Radiography in Adult Patients with Symptoms of Acute Bronchitis

- Dyspnea, bloody sputum, or rusty sputum color
- Pulse > 100 beats per minute
- Respiratory rate > 24 breaths per minute
- Oral body temperature > 100°F (37.8°C)
- Focal consolidation, egophony, or fremitus on chest examination

*Information from reference 22.*
CDC funded study of millions of patient visits and prescribing patterns

description rates by care setting for visits for antibiotic inappropriate respiratory diagnoses (viral URI, bronchitis, asthma, non-suppurative otitis media, etc)

1. Urgent Care Center- 45.7%
2. Emergency Dept- 24.6%
3. Medical offices - 17.0%
4. Retail clinics- 14.4%

Conclusion : “unnecessary prescribing practice in outpatient settings likely to exceed reported 30% of all dispensed antibiotics”
In a time of on-line social media physician evaluations - What are we up against ???

How challenging is the problem of FQ overprescribing?

Big, but we have to start trying to solve it...
2014 National Ambulatory Medical Care Survey
- 31.5 million Fluoroquinolone Rx’s dispensed
- 7.9 million FQ rx (approx. 25% of total) given for either viral URI or bronchitis (conditions not requiring antibiotics) or not recommended for first line therapy (uncomplicated UTI or sinusitis)
Fluoroquinolone toxicities can cause disastrous side-effects
2016 FDA Warnings: Potential fluoroquinolone side-effects

- Increased risk, greater than with most other antibiotics, for causing *C. difficile* colitis
- **Acute Tendonitis** - particularly Achilles tendonitis and rupture, can be unilateral or bilateral, and can occur at any time with these antibiotics
- **QT prolongation** - can cause Torsades. Some fluoroquinolones have been taken off the market because of this problem.
- **Peripheral neuropathy** - may be irreversible
- **Central nervous system toxicities** - particularly in older patients
FDA Drug Safety Communication - FDA advises restricting use for certain uncomplicated infections. Posted May 12, 2016

- **FDA recommends that:**
  - Serious side effects associated with fluoroquinolone antibacterial drugs generally outweigh the benefits for patients with **acute sinusitis**, **acute bronchitis**, and **uncomplicated urinary tract infections (UTI)** who have other treatment options.

- **For patients with these conditions, fluoroquinolones should be reserved for those who do not have alternative treatment options.**

- **FDA states** “Providers should instruct patients to contact their health care professional immediately if they experience any serious side effects while taking fluoroquinolone medicine such as tendon, joint and muscle pain; a “pins and needles” tingling or pricking sensation; confusion; and hallucinations”.

- **“Providers should stop systemic fluoroquinolone treatment immediately if a patient reports serious side effects, and switch to a non-fluoroquinolone antibacterial drug to complete the patient’s treatment course.”**
July 2018 FDA adds additional fluoroquinolone warnings:

- **Fatal hypoglycemia**
  - Report of at least 67 cases of life-threatening hypoglycemic coma - including 13 deaths, 9 with permanent and disabling injuries.
  - Occurred more frequently in the elderly and those with diabetes taking an oral hypoglycemic medicine or insulin.
  - Others had renal insufficiency as a risk factor (? Was dose renally adjusted)
  - 4 of these antibiotics have labeled drug interaction already with sulfonylurea
  - Seen mostly with levofloxacin (44), cipro (12)
Also, **new neuropsychiatric side-effects** noted in 2018 update- new labeling to make these warnings more prominent and consistent across all the fluoroquinolones.

<table>
<thead>
<tr>
<th>Disturbances in attention (new)</th>
<th>Memory impairment (new)</th>
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<tbody>
<tr>
<td>Delirium (new)</td>
<td>Nervousness</td>
</tr>
<tr>
<td>Agitation</td>
<td>Disorientation</td>
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If possible, avoid Fluoroquinolones for the treatment of:

- Urinary Tract infections
- Asymptomatic bacteriuria
- Upper respiratory tract infections
It can be done! - Antimicrobial stewardship can assist physicians in reducing FQ use- 29 hospitals participating in Duke Center for antimicrobial Stewardship. FQ use had been declining even before 2016, but took an abrupt drop after that:

“Impact of FDA Black Box Warning on Fluoroquinolone and Alternative Antibiotic Use in Southeastern U.S. Hospitals” Abstract 855, ID Week
<table>
<thead>
<tr>
<th>Don't</th>
<th>Do Say</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ask questions such as:</strong></td>
<td>• “Tell me about your symptoms.”</td>
</tr>
<tr>
<td>• “Why are you here?”</td>
<td>• “What symptoms are you having?”</td>
</tr>
<tr>
<td>• “What do you need?”</td>
<td></td>
</tr>
<tr>
<td>• “How can I help you today?”</td>
<td></td>
</tr>
<tr>
<td><strong>Minimize their illness:</strong></td>
<td>• “You have an upper respiratory infection. This is caused by a virus. It can make you feel really bad for a few weeks, but there are some things we can do to help you feel better.”</td>
</tr>
<tr>
<td>• “It’s just a virus/cold.”</td>
<td>• “Getting plenty of rest is important to help fight viruses. If you push yourself too hard, it may take longer for you to get better.”</td>
</tr>
<tr>
<td>• “You have to let this run its course.”</td>
<td></td>
</tr>
<tr>
<td><strong>Be indecisive:</strong></td>
<td>• “You have a virus.”</td>
</tr>
<tr>
<td>• “It’s probably a virus.”</td>
<td>• “Antibiotics will not help you feel better because your illness is viral.”</td>
</tr>
<tr>
<td>• “Antibiotics probably won’t help”</td>
<td>• “You have an upper respiratory infection which is caused by a virus.”</td>
</tr>
<tr>
<td>• “Most upper respiratory infections are caused by viruses.”</td>
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</table>
Patient Materials

Why does taking antibiotics lead to antibiotic resistance?

Any time antibiotics are used, they can cause side effects and lead to antibiotic resistance. Antibiotic resistance is one of the most urgent threats to the public’s health. Always remember:

1. Antibiotic resistance does not mean the body is becoming resistant to antibiotics; it means that bacteria have become resistant to the antibiotics designed to kill them.
2. When bacteria become resistant, antibiotics cannot fight them, and the bacteria multiply.
3. Some resistant bacteria can be harder to treat and can spread to other people.

Each year in the United States, at least 2 million people get infected with antibiotic-resistant bacteria. At least 23,000 people die as a result.

What is the right way to take antibiotics?

If you need antibiotics, take them exactly as prescribed. Improving the way healthcare professionals prescribe antibiotics, and the way we take antibiotics, helps keep us healthy now, helps right antibiotic resistance, and ensures that these life-saving drugs will be available for future generations.

Talk with your doctor if you have any questions about your antibiotics, or if you develop any side effects, especially diarrhea, once that could be Clostridium difficile infection (also called C. diff or C. diff), which needs to be treated. C. diff can lead to serious colon damage and death.

What are the side effects?

Common side effects range from minor to very severe health problems and can include:

- Rash
- Diarrhea
- Nausea
- Rash
- Yeast infections

More serious side effects include:

- Clostridium difficile infection
- Severe and non-inflamatory allergic reactions

To learn more about antibiotic prescribing and use, visit www.cdc.gov/antibiotic-use.

Symptom Relief for Viral Illnesses

1. DIAGNOSIS

- Cough or cold
- Middle ear fluid
- Pink eye with pus, red eye
- Flu
- Viral sore throat
- Bronchitis

Other:

You have been diagnosed with or illness caused by a virus. ANTIBIOTICS DO NOT work on viruses. While medications may relieve your symptoms, the side effects could hurt you. The treatments prescribed here will help you feel better while your body fights off the virus.

2. GENERAL INSTRUCTIONS

- Drink extra water and fluids.
- Use a cool mist vaporizer or saline nasal spray to relieve congestion.
- For some throat colds in children and adults, use ice chips, sore throat spray, or lozenges.
- Use honey to relieve cough. Do not give honey to an infant younger than 1.

3. SPECIFIC MEDICINES

- Fever or aches:
- Pain
- Some throat and congestion:

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