Antibiotic Stewardship in Urgent Care – Current Treatment Recommendations

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Find the slide on the event webpage:
Antibiotic Stewardship In UC: Current Treatment Recommendations

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UCA Clinical Content Coordinator
Disclosures

• Dr Toscano received a speakers honorarium from Beckitt Renkiser for a one-time event unrelated to the current topic.

• No off-label or experimental therapies or devices will be discussed in this presentation.
Learning Objectives

• Identify many potential harms of inappropriate antibiotic prescribing
• Apply recommendations from current clinical practice guidelines to complement the goals of antibiotic stewardship
• Summarize rational antibiotic choices for antibiotic prophylaxis and infections commonly seen in urgent care practice
• Describe common over-prescribing scenarios that can be easily stopped
• Compare which strategies may help patients better accept a decision to forgo antibiotics
What is stewardship?

Stewardship = careful and responsible management
What is stewardship?

Stewardship = careful and responsible management

......of a very important resource
Why do we need to be “stewards”? 

- Antibiotic use is the most important potentially changeable driver of antibiotic resistance 
- Antibiotic-resistant infections → higher healthcare costs, poor health outcomes, and more toxic treatments 
- CDC estimates 23,000 deaths a year due to antibiotic resistance and cost of $30 billion 
- At least 30% of antibiotic outpatient Rxes may be unnecessary - **no antibiotic is needed at all.** Most = acute RTIs - colds, bronchitis, viral pharyngitis, and even some sinus and ear infections. 
- Total inappropriate antibiotic use, which includes needless antibiotic use plus inappropriate antibiotic selection, dosing, and duration, may approach 50% of all outpatient antibiotic use.

Antibiotics are the most common cause of adverse drug events (ADEs) in children. 7 of the top 10 drugs leading to pediatric ADE-related emergency room (ER) visits. Antibiotics are in the top three drug classes leading to ADE-related ER visits for all ages.

Estimated 5 to 25% of those receiving antibiotics will have an ADE. About 20% of ED visits for ADE are antibiotic-related. Improving antibiotic prescribing can reduce harm. A 10% decrease in inappropriate prescribing in the community can result in a 17% reduction in *Clostridium difficile* infection.

https://www.cdc.gov/antibiotic-use/community/improving-prescribing/outpatient-stewardship.html
Why do we need to be “stewards”?

**CDC THREAT LEVELS: “SUPERBUGS”**

**HAZARD LEVEL URGENT**
- *Clostridium difficile*
- Carbapenem-R Enterobacteriaceae (CRE)
- Cephalosporin-R *Neisseria gonorrhoeae*

**HAZARD LEVEL SERIOUS**
- MDR *Acinetobacter*, MDR *Pseudomonas*, ESBL GNRs
- MRSA, VRE, Drug-R pneumococcus, Drug-R Enteric GNRs
- MDR and XDR TB, Azole-resistant Candida

**HAZARD LEVEL CONCERNING**
- Vancomycin-R *Staphylococcus aureus*
- Macrolide-R group A streptococci
- Clindamycin-R group B streptococci

Why do we need to be “stewards”? 

<table>
<thead>
<tr>
<th>Facility</th>
<th>No. of Visits</th>
<th>% Visits Linked to Antibiotic Prescribing</th>
<th>Visits for Antibiotic-Inappropriate Respiratory Diagnoses</th>
<th>% Antibiotic Prescribing Among Visits for Antibiotic-Inappropriate Respiratory Diagnoses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urgent Care Center</td>
<td>2.7M</td>
<td>39%</td>
<td>441.6K</td>
<td>45.7%</td>
</tr>
<tr>
<td>Retail Clinic</td>
<td>58.2K</td>
<td>36.4%</td>
<td>10K</td>
<td>14.4%</td>
</tr>
<tr>
<td>Emergency Department</td>
<td>4.8M</td>
<td>13.8%</td>
<td>257K</td>
<td>24.6%</td>
</tr>
<tr>
<td>Medical Office</td>
<td>148.5M</td>
<td>7.1%</td>
<td>9.2M</td>
<td>17.0%</td>
</tr>
</tbody>
</table>

All good and no bad?

- Higher cost
- Poorer outcomes
- Needless allergic reactions
- Nausea, vomiting, diarrhea
- *Clostridium difficile* syndromes
- Tendinopathy
- QT prolongation
- Renal insufficiency
- Medication interactions
All good and no bad?

“Medicalising” effect of prescribing:

• Those prescribed antibiotics for sore throat are more likely to seek medical care for their next sore throat
• No difference in outcomes whether, for uncomplicated pharyngitis or tonsillitis, antibiotics were prescribed immediately, in delayed fashion, or not at all

Why?

- “That’s how I was trained.”
- “I don’t want a bad outcome for my patient.”
- “I need to prescribe like my colleagues do.”
- “My patients won’t be satisfied without an antibiotic.”
- “The antibiotic samples are going to expire.”
- “The drug rep buys lunch for the office.”
- “The practice makes money on dispensing.”
Because

- Antibiotic resistance is rising and is related to our prescribing
- Antibiotics account for a large proportion of UC overall prescriptions
- Though decreasing, “over-prescription” is still too common
- Educational interventions for physicians and patients can reduce over-prescription
- Evidence-based guidelines for treating these infections exist
Guideline sources

- Adult/Pediatric compendia: www.phcdocs.org/aware
- www.cdc.gov/getsmaart
- www.idsociety.org/Practice-Guidelines
- https://www.icsi.org/guideline_sub-pages/respiratory_illness
Guideline tools - AWARE

Best Practices in the Management of Patients with Acute Bronchitis/Gauh

Evidence-Based Management of Acute Respiratory Tract Infections

Recurrent studies and meta-analyses have demonstrated no significant benefit from antibiotics in otherwise healthy persons. Antibiotic administration is associated with allergic reactions, 0.3% of allergic reactions and 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
  • Cough
  • Sore throat
  • Runny nose
  • Fever

Upper Respiratory Infections
  • Cough plus nasal, throat, and ear symptoms
  • No febrile symptoms

Influenza During the Season
  • Fever
  • Headache
  • Fatigue
  • Rash
  • Pharyngeal pain

See reason for recommendation on antibiotic therapy

Antibiotics NOT needed

Inspirator

Emergence of resistance to antibiotics used for the treatment of acute respiratory infections is an ongoing concern. However, no study has shown that antibiotics are less effective when started later in the course of illness. The absence of fever, cough, and respiratory symptoms in a patient with a known risk factor for pneumonia does not exclude the diagnosis of pneumonia.

Guideline tools - AWARE

Supporting Organizations

Acute Care Physicians Association
American Academy of Family Physicians
American Academy of Pediatrics
American Thoracic Society
Infectious Diseases Society of America
National Jewish Health
National Marrow Donor Program
University of California, San Francisco

Endorsing Organizations

American Respiratory Care Foundation
American Thoracic Society
Infectious Diseases Society of America
National Jewish Health
National Marrow Donor Program
University of California, San Francisco

Download the free AWARE Companion App today!

For more information visit: www.aware.md

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Acute Infection Guideline Summary

CURRENTLY ADOPTED PNEUMONIA


Community-Acquired Pneumonia


Community-Acquired Pneumonia Patients

Guideline tools - AWARE

<table>
<thead>
<tr>
<th>Disease</th>
<th>Indications for Antibiotic Treatment in Adults</th>
<th>Pathogens</th>
<th>Antimicrobial Therapy</th>
<th>Antibiotic</th>
<th>Guidelines Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outpatient Community Acquired Pneumonia</td>
<td>When <em>Not</em> to Treat with an Antibiotic: <strong>AWARE</strong></td>
<td>Streptococcus pneumoniae</td>
<td>Empirical Therapy: <em>Not indicated</em></td>
<td><em>Not indicated</em></td>
<td><em>Not indicated</em></td>
</tr>
<tr>
<td></td>
<td>When <em>To</em> Treat with an Antibiotic: <strong>AWARE</strong></td>
<td>Staphylococcus aureus</td>
<td><em>Not indicated</em></td>
<td><em>Not indicated</em></td>
<td><em>Not indicated</em></td>
</tr>
<tr>
<td></td>
<td>Acute Bacterial Sialoceleitis</td>
<td>Neisseria gonorrhoeae</td>
<td><em>Not indicated</em></td>
<td><em>Not indicated</em></td>
<td><em>Not indicated</em></td>
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<td></td>
<td>Pharyngitis</td>
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<td>When <em>Not</em> to Treat with an Antibiotic: <strong>AWARE</strong></td>
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<td><em>Not indicated</em></td>
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<td></td>
<td>Monophasic URI</td>
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<td></td>
<td>When <em>Not</em> to Treat with an Antibiotic: <strong>AWARE</strong></td>
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<td><em>Not indicated</em></td>
</tr>
</tbody>
</table>
ADULT AND PEDIATRIC ANTIBIOTIC PRESCRIBING GUIDELINES

Adult Outpatient Treatment Recommendations 2017: Summary of Guidelines

Acute Pharyngitis
- 90-98% of cases are viral
- Antibiotics may NOT help even if cause is bacterial

Diagnosis
- Symptoms of acute bacterial pharyngitis:
  - Sore throat, fever, tender lymph nodes in the neck
  - Persistent with symptoms even after treatment

Management
- Provide appropriate antibiotic therapy
- Only penicillin or cefadroxil is recommended

Common cold or non-specific upper respiratory tract infection (URI)
- Most adults get 2-4 colds annually

Acute uncomplicated bronchitis
- Viral cause in 90% of acute bronchitis
- Cough typically lasts 3 days to 2 weeks

Management
- Routine treatment of uncomplicated acute bronchitis with antibiotics is NOT recommended, regardless of cough duration
- Patients may benefit from symptomatic therapy

Common colds
- Antioxidants and vitamins do NOT help
- Treatment is symptomatic

Pharyngitis
- Group A Streptococcus (GAS) is the only common indicator for antibiotics
- Only 5-10% of cases in adults are caused by GAS

Diagnosis
- Patients with GAS pharyngitis who do NOT have typical GAS pharyngitis
- Oral temperature ≥38°C (100°F)
- Rapid testing with a GAS nuclease antigen test

Treatment
- Common colds
- Patients with colds are NOT treated

Pharyngitis
- Patients with typical GAS pharyngitis
- Oral temperature <38°C (100°F)
- Rapid testing with a GAS nuclease antigen test

Treatment
- Common colds
- Patients with colds are NOT treated

Guideline tools - NY State DOH


Marybeth.wenger@health.ny.gov
Highest quality practice

• Diagnose correctly and specifically
• When indicated, use simple objective tests to confirm bacterial or viral diagnoses and the need for antibiotics
• Consider the downside with every Rx
• Stay current with diagnosis and treatment recommendations
• Educate colleagues and patients
• “Diagnosers”/“Educators” vs “Prescribers”
...and when we prescribe

- Correct patient/diagnosis
- Correct agent/spectrum
- Correct dosage
- Correct duration

Strive to change, get current, be consistent, spread the word
Notable exceptions

- Ill patients
  - Abnormal or unstable VS
  - SIRS/qSOFA characteristics
- Patients with comorbidities
  - DM, cancer, CTD, immunosuppressive meds, renal/hepatic insufficiency
- Significant infections
  - pneumonia, pyelonephritis
Otitis Media – Correct diagnosis for Rx

- Should diagnose AOM: in children with moderate or severe bulging of the TM or new onset of otorrhea not due to acute OE
- May diagnose AOM: mild bulging of the TM and recent (< 48 hours) onset of ear pain (or holding, tugging, rubbing of ear) or intense erythema of the TM
- Should not diagnose AOM: who do not have middle ear effusion (on pneumatic otoscopy and/or tympanometry)
Otitis media

FIGURE 2
Otitis Media – Antibiotic treatment for:
• 6 mos or older with severe AOM: severe signs or symptoms (moderate or severe ear pain or pain for > 48 hours or temp > 102.2°F)
• 6 to 23 mos with nonsevere but bilateral AOM

Otitis Media – Antibiotic or observation for:
• 6 to 23 mos with nonsevere unilateral AOM
• 24 mos or older with nonsevere AOM
Otitis Media – First Line

• Attention to pain for all patients
• Ten-day antibiotic course for those under 2 years old; 7 days for those 2-5 years old; 5-7 days for ≥ 6 years old
• Amoxicillin is fine for most
  • 80-90 mg/kg/day divided BID
• Amoxicillin/clavulanate also 1st line if amox w/i 30 days, purulent conjunctivitis, prior failure with amox
  • 80-90 mg/kg/day divided BID
Otitis Media – Second Line

- Cefdinir, Cefpodoxime, Cefuroxime
- Ceftriaxone IM – 1 or 3 days
- Clindamycin for PCN allergy
- Less favored – due to drug-resistant *S. pneumo*
  - Cefixime, Cefaclor, Loracarbef, Cefibuten, TMP/Sulfa, Erythromycin/sulfisoxazole
- NO macrolides
### Acute Sinusitis

**Acute Sinusitis**
- Clinical diagnosis is nonspecific

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Sensitivity</th>
<th>Specificity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purulent nasal discharge</td>
<td>35%</td>
<td>78%</td>
</tr>
<tr>
<td>Pain on bending forward</td>
<td>75%</td>
<td>77%</td>
</tr>
<tr>
<td>Maxillary toothache</td>
<td>66%</td>
<td>49%</td>
</tr>
<tr>
<td>Symptoms after URI</td>
<td>89%</td>
<td>79%</td>
</tr>
<tr>
<td>Nasal obstruction</td>
<td>60%</td>
<td>22%</td>
</tr>
</tbody>
</table>

Acute sinusitis

Acute Sinusitis – Correct diagnosis for Rx

• For **severe symptoms** ≥ 3-4 days
• For **persistent symptoms** ≥ 10 days
• For **worsening symptoms** after typical URI for 5-6 days that were initially improving – “double sickening”
• **Chronic** sinusitis – ENT consultation
• Risk factors for resistance - < 2y, > 65y, PNS ≥ 10%, abx w/i 30 days, hospitalization w/i 5 days, comorbidities, IC
## Acute sinusitis – IDSA - Children

<table>
<thead>
<tr>
<th>Indication</th>
<th>First-line (Daily Dose)</th>
<th>Second-line (Daily Dose)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial empirical therapy</td>
<td>• Amoxicillin-clavulanate (45 mg/kg/day PO bid)</td>
<td>• Amoxicillin-clavulanate (90 mg/kg/day PO bid)</td>
</tr>
<tr>
<td>β-lactam allergy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type I hypersensitivity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-type I hypersensitivity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risk for antibiotic resistance or failed initial therapy</td>
<td></td>
<td>• Amoxicillin-clavulanate (90 mg/kg/day PO bid)</td>
</tr>
<tr>
<td>Severe infection requiring hospitalization</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Levofloxacin (10–20 mg/kg/day PO every 12–24 h)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Clindamycin⁹ (30–40 mg/kg/day PO tid) plus cefixime (8 mg/kg/day PO bid) or cefpodoxime (10 mg/kg/day PO bid)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Levofloxacin (10–20 mg/kg/day PO every 12–24 h)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Ampicillin/sulbactam (200–400 mg/kg/day IV every 6 h)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Ceftriaxone (50 mg/kg/day IV every 12 h)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Cefotaxime (100–200 mg/kg/day IV every 6 h)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Levofloxacin (10–20 mg/kg/day IV every 12–24 h)</td>
<td></td>
</tr>
</tbody>
</table>

Abbreviations: bid, twice daily; IV, intravenously; PO, orally; qd, daily; tid, 3 times a day.

⁹ Resistance to clindamycin (~31%) is found frequently among *Streptococcus pneumoniae* serotype 19A isolates in different regions of the United States [94].
<table>
<thead>
<tr>
<th>Indication</th>
<th>First-line (Daily Dose)</th>
<th>Second-line (Daily Dose)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial empirical therapy</td>
<td>● Amoxicillin-clavulanate (500 mg/125 mg PO tid, or 875 mg/125 mg PO bid)</td>
<td>● Amoxicillin-clavulanate (2000 mg/125 mg PO bid)</td>
</tr>
<tr>
<td>β-lactam allergy</td>
<td>● Doxycycline (100 mg PO bid or 200 mg PO qd)</td>
<td>● Levofloxacin (500 mg PO qd)</td>
</tr>
<tr>
<td></td>
<td>● Doxycycline (100 mg PO bid or 200 mg PO qd)</td>
<td>● Moxifloxacin (400 mg PO qd)</td>
</tr>
<tr>
<td>Risk for antibiotic resistance or failed initial therapy</td>
<td>● Amoxicillin-clavulanate (2000 mg/125 mg PO bid)</td>
<td>● Levofloxacin (500 mg PO qd)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Moxifloxacin (400 mg PO qd)</td>
</tr>
<tr>
<td>Severe infection requiring hospitalization</td>
<td>● Ampicillin-sulbactam (1.5–3 g IV every 6 h)</td>
<td>● Levofloxacin (500 mg PO or IV qd)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Moxifloxacin (400 mg PO or IV qd)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Ceftriaxone (1–2 g IV every 12–24 h)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Cefotaxime (2 g IV every 4–6 h)</td>
</tr>
</tbody>
</table>

Abbreviations: bid, twice daily; IV, intravenously; PO, orally; qd, daily; tid, 3 times a day.
Acute sinusitis

- Duration – adult 5-7 days; children 10-14 days
- No macrolides (erythromycin, azithromycin, clarithromycin)
- No TMP/SMX
- No second or third generation cephalosporins (except combination third-generation plus clinda in PCN allergic children)
- No PO or topical decongestants or antihistamines
- Intranasal saline irrigation and steroids may help
Acute Bronchitis – Correct diagnosis for Rx

- Almost never
- ? Elderly (over 65) NNT = 39*
- Acute COPD exacerbation (ABECB)
- Other chronic lung diseases EXCEPT asthma
- If pneumonia or pertussis is present

* Petersen et al. BMJ 2007 335(7627):982
Acute Bronchitis – treatment

- Symptomatic care for all patients – β-agonist inhaler, analgesics, antipyretics, mucolytic, etc
- Cough suppressants?
- Pertussis – macrolides, TMP/SMX
- Elderly/ABECB – Amoxicillin, TMP/SMX, Doxycycline
Acute Pharyngitis

• Attention to pain for all patients
• Consider the differential diagnosis
• Viruses 40-60% of the time or more
• Use an systematic approach, *eg*, Centor score and rapid strep testing
  • Fever, either at home or in clinic
  • Anterior cervical lymphadenopathy
  • Tonsillar exudates
  • **Absence** of other associated URI symptoms (runny or congested nose, cough)
Acute Pharyngitis – Correct diagnosis for Rx

- Positive rapid strep antigen test *
- Positive throat culture *
- GC, *Mycoplasma*, diphtheria
- Peritonsillar abscess

*prophylaxis for rheumatic fever, decrease contagion, decrease in symptom duration
Acute pharyngitis

Acute Pharyngitis - treatment

• Symptomatic care for all patients – analgesics, antipyretics, +/- corticosteroids

• **Penicillin** – 250 mg QID or 500 mg BID for 10 days

• 1.2 million U IM or 500 mg PO BID or 250 mg PO TID

• Peds: 0.6 million U IM or 10mg/kg/dose PO BID-TID

• Alternatives – 10 days
  – Amoxicillin, First gen cephalosporins, Clindamycin
  – Macrolide (Clarithromycin, Azithromycin*)

• **Avoid** the big guns: quinolones, amox/clavulanate
# Acute pharyngitis

## Table 2. Antibiotic Regimens Recommended for Group A Streptococcal Pharyngitis

<table>
<thead>
<tr>
<th>Drug, Route</th>
<th>Dose or Dosage</th>
<th>Duration or Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>For individuals without penicillin allergy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Penicillin V, oral</td>
<td>Children: 250 mg twice daily or 3 times daily; adolescents and adults: 250 mg 4 times daily or 500 mg twice daily</td>
<td>10 d</td>
</tr>
<tr>
<td>Amoxicillin, oral</td>
<td>50 mg/kg once daily (max = 1000 mg); alternate: 25 mg/kg (max = 500 mg) twice daily</td>
<td>10 d</td>
</tr>
<tr>
<td>Benzathine penicillin G, intramuscular</td>
<td>&lt;27 kg: 600 000 U; ≥27 kg: 1 200 000 U</td>
<td>1 dose</td>
</tr>
<tr>
<td>For individuals with penicillin allergy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cephalexin, (^b), oral</td>
<td>20 mg/kg/dose twice daily (max = 500 mg/dose)</td>
<td>10 d</td>
</tr>
<tr>
<td>Cefadroxil, (^b), oral</td>
<td>30 mg/kg once daily (max = 1 g)</td>
<td>10 d</td>
</tr>
<tr>
<td>Clindamycin, oral</td>
<td>7 mg/kg/dose 3 times daily (max = 300 mg/dose)</td>
<td>10 d</td>
</tr>
<tr>
<td>Azithromycin, (^c), oral</td>
<td>12 mg/kg once daily (max = 500 mg)</td>
<td>5 d</td>
</tr>
<tr>
<td>Clarithromycin, (^c), oral</td>
<td>7.5 mg/kg/dose twice daily (max = 250 mg/dose)</td>
<td>10 d</td>
</tr>
</tbody>
</table>
Community-acquired pneumonia - adult
Community-acquired pneumonia - adult

- Cover atypical and typical organisms
- Consider drug-resistant *S. pneumoniae* (DRSP) factors
  - age < 2 or > 65
  - comorbidities, immune-suppression
  - β-lactam exposure within prior 3 months
  - children in day-care and exposure to them
- For exposure to any antimicrobials within the prior 3 months
  - choose a medication from a different class
Community-acquired pneumonia - adult

Previously healthy patients, no DRSP risk factors

azithromycin, clarithromycin or erythromycin

OR

doxycycline (weak recommendation)

(only if macrolide-resistant  S. pneumo is not > 25%)
Community-acquired pneumonia - adult

Comorbidities, DRSP risk factors, antibiotic exposure within 3 months, > 25% MRSP

moxifloxacin or levofloxacin

OR

a macrolide (or doxycycline)

PLUS

high-dose amoxicillin or amoxicillin/clavulanate
or ceftriaxone or cefpodoxime or cefuroxime
Community-acquired pneumonia - adult

- Antibiotics for a **minimum** of 5 days
- Use short course if approved
  - levofloxacin 750 mg/day x 5 days
  - azithromycin 500mg x 1; 250 mg/d x 4 days
- Treat until afebrile for 48-72 hours, and
- Clinically stable (no >1 criterion out of parameter)
  - Normal MS; adequate PO intake
  - O2 sat ≥ 90%
  - Systolic BP ≥ 90
  - P < 100; RR < 24
Community-acquired pneumonia - kids > 3 mos

- Antibiotics for 10 days
- **Amoxicillin** (90 mg/kg/day, divided BID) is 1\textsuperscript{st} line in previously healthy, immunized children with mild to moderate PNA
- Use **macrolide** only in older children with evidence of atypical disease
- Expect improvement in 48-72 hours – investigate further if this is not the case
Urinary Tract Infection - Cystitis

Diagnosis for Rx

• Symptoms – UT, fever, flank pain/tenderness
• Nitrites, leukocyte esterase on dipstick
• > 10 wbcs per HPF adult
• > 5 wbcs per HPF children
• Urine culture thresholds
  – 100,000 cfu/ml adult
  – 50,000 cfu/ml children
Urinary Tract Infection - Cystitis - Children

White, B. *Am Fam Physician*. 2011;83(3):409-415
Urinary Tract Infection - Cystitis - Adult

- Nitrofurantoin 100 mg BID for 5 days
  OR
- Trimethoprim-sulfamethoxazole DS (160/800 mg) BID for 3 days (if prevalence of resistance is < 20%)
  OR
- Fosfomycin trometamol 3 gm single dose
  OR
- Pivmecillinam 400 mg BID for 5 days (not available in the United States)
If availability or allergy history precludes these choices, then use:

- Fluoroquinolones for 3 days
- OR
- Beta-lactams (amoxicillin-clavulanate, cefdinir, cefaclor, or cefpodoxime-proxetil) for 3 to 7 days
If fluoroquinolone resistance prevalence is less than 10%

- Ciprofloxacin 500 mg BID for 7 days, with or without an initial 400-mg dose of IV ciprofloxacin or 1 g of IV ceftriaxone or a consolidated 24-hour IV dose of an aminoglycoside
  
  OR

- Ciprofloxacin XR 1000 mg once daily for 7 days
  
  OR

- Levofloxacin 750 mg once daily for 5 days
Urinary Tract Infection - Pyelonephritis

If infecting organism is known to be susceptible

• Trimethoprim-sulfamethoxazole DS (160/800 mg) BID for 14 days, plus an initial 1 g dose of IV ceftriaxone*

Only if above regimens are contraindicated

• Oral beta-lactam (amoxicillin-clavulanate, cefdinir, cefaclor, or cefpodoxime-proxetil) for 10-14 days, plus an initial 1 g dose of IV ceftriaxone*

* or a consolidated 24-hour IV dose of an aminoglycoside
# Urinary Tract Infection - Children

<table>
<thead>
<tr>
<th>Antimicrobial Agent</th>
<th>Dosage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amoxicillin-clavulanate</td>
<td>20–40 mg/kg per d in 3 doses</td>
</tr>
<tr>
<td><strong>Sulfonamide</strong></td>
<td></td>
</tr>
<tr>
<td>Trimethoprim-sulfamethoxazole</td>
<td>6–12 mg/kg trimethoprim and 30-60 mg/kg sulfamethoxazole per d in 2 doses</td>
</tr>
<tr>
<td>Sulfisoxazole</td>
<td>120–150 mg/kg per d in 4 doses</td>
</tr>
<tr>
<td><strong>Cephalosporin</strong></td>
<td></td>
</tr>
<tr>
<td>Cefixime</td>
<td>8 mg/kg per d in 1 dose</td>
</tr>
<tr>
<td>Cefpodoxime</td>
<td>10 mg/kg per d in 2 doses</td>
</tr>
<tr>
<td>Cefprozil</td>
<td>30 mg/kg per d in 2 doses</td>
</tr>
<tr>
<td>Cefuroxime axetil</td>
<td>20–30 mg/kg per d in 2 doses</td>
</tr>
<tr>
<td>Cephalexin</td>
<td>50–100 mg/kg per d in 4 doses</td>
</tr>
</tbody>
</table>
Skin and Soft Tissue Infection

- CA-MRSA on the rise, but typically causes only suppurative infections
- MSSA and Strep are still the most common causes of non-suppurative cellulitis
- Incision and drainage is the treatment for abscesses
- Add antibiotics (with MRSA Coverage) only for associated cellulitis, systemic illness, immuno-compromise, areas difficult to I&D, septic phlebitis, extremes of age, lack of initial response to I&D or MSSA coverage alone
- Beware of indurated cellulitis
Skin and soft tissue infections

- **Erysipelas**
  - Penicillin
- **MSSA/Strep**
  - Penicillin
  - Cephalexin or Dicloxacillin
  - Azithromycin
  - Clindamycin

  **DURATION: 5 DAYS**

- **CA-MRSA**
  - Doxycycline, minocycline
  - TMP/SMX
  - Clindamycin

- **Animal/Human bite wound infections**
  - Amoxicillin/clavulanate
  - Doxycycline, others
Easy to avoid?

- No routine wound prophylaxis (?bite wounds)
- No FQs as first-line for uncomplicated UTI, acute sinusitis, bronchitis/COPD exacerbation, *diarrhea*
- No antibiotics for simple abscesses s/p I&D
- No antibiotics with nasal packing
- No antibiotics for uncomplicated influenza, RAD exacerbation, bronchiolitis
- No antibiotics for routine dental pain/caries
- No PO antibiotics for uncomplicated otitis externa
Meeting/Changing patient expectations

- Explain harms and that they can exceed benefit
- Discuss side-effects with each Rx that is needed
- Explain that this is new science
- Weave-in stories from the media
- Offer symptomatic treatment
- Leave the door open for easy follow-up
- Ask and address all concerns
- Offer safety-net prescription*

*Little P et al BMJ 2014;348;g1606
Meeting/Changing Patient Expectations

- “If you are the type of person who does not like to take an antibiotic unless you really need to, then you can wait a bit”
- “Your body’s immune system can fight this.”
- “There is always a downside to taking an antibiotic, even when you can some expect benefit.”
Meeting/changing patient expectations

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.

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 body 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.consumerlab.org
Meeting/changing patient expectations

### Antibiotics do not kill viruses.

Here are some options that may help your child 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><strong>Drink plenty of fluids (like water and clear soup)</strong>&lt;br&gt;<strong>Stay home and rest</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Stuffy Nose</strong></td>
<td><strong>Use a room humidifier</strong>&lt;br&gt;<strong>Sodium nose drops or spray</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Runny Nose</strong></td>
<td><strong>For adults, use nose, and petroleum jelly or saline on the anterior</strong>&lt;br&gt;<strong>Use tissue withestion</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Dry Cough</strong></td>
<td><strong>Use a room humidifier</strong>&lt;br&gt;<strong>Gargle with warm salt water</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Meat Cough</strong></td>
<td><strong>Drink more fluids</strong>&lt;br&gt;<strong>Gargle with warm salt water</strong>&lt;br&gt;<strong>Gargle with rubbing alcohol</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sore Throat</strong></td>
<td><strong>Gargle with warm salt water</strong>&lt;br&gt;<strong>Gargle with rubbing alcohol</strong>&lt;br&gt;<strong>Drink tea</strong></td>
<td><strong>Throat lozenges; soothing throat drops</strong>&lt;br&gt;<strong>Do not give to children younger than 10 years of age</strong></td>
<td><strong>Menthol</strong>&lt;br&gt;<strong>Honey</strong>&lt;br&gt;<strong>Stimulants</strong></td>
<td><strong>Ibuprofen®</strong>&lt;br&gt;<strong>Tylenol®</strong>&lt;br&gt;<strong>Delsym®</strong></td>
</tr>
<tr>
<td><strong>Fever / Muscle Aches</strong></td>
<td><strong>Ice compresses</strong>&lt;br&gt;<strong>Warm compresses on sore muscles</strong>&lt;br&gt;<strong>Rest</strong></td>
<td><strong>Fever reducing pain reliever</strong></td>
<td><strong>Ibuprofen</strong>&lt;br&gt;<strong>Ibuprofen</strong>&lt;br&gt;<strong>Ibuprofen</strong></td>
<td><strong>Tylenol®</strong>&lt;br&gt;<strong>Tylenol®</strong>&lt;br&gt;<strong>Tylenol®</strong></td>
</tr>
<tr>
<td><strong>Itchy, Watery Eyes / Sneezing</strong></td>
<td><strong>Avoid things you are allergic to or that cause irritation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ear Ache</strong></td>
<td><strong>Warm compresses against the sore ear</strong></td>
<td><strong>Fever reducing pain reliever</strong></td>
<td><strong>Ibuprofen</strong>&lt;br&gt;<strong>Ibuprofen</strong>&lt;br&gt;<strong>Ibuprofen</strong></td>
<td><strong>Tylenol®</strong>&lt;br&gt;<strong>Tylenol®</strong>&lt;br&gt;<strong>Tylenol®</strong></td>
</tr>
</tbody>
</table>

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

*Most names are listed as examples and do not imply endorsement. Check local pharmacy for brand name availability.*

*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.*
Meeting/changing patient expectations

### Viruses or Bacteria: What's got you sick?

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Viruses</th>
<th>Bacteria</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cough</td>
<td></td>
<td></td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Sore Throat</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Runny Nose</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fever</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Headache</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fatigue</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Antibiotics may help bacterial infections, but viruses cannot be treated with antibiotics. Always consult a healthcare provider for tips on how to relieve symptoms and feel better.*

### GET SMART: Know When Antibiotics Work

**Get Smart: Take your role in this chain of defense against overuse of antibiotics.**

**Know When Antibiotics Work**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Cold</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Mild Cough (within 48 hours)</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Non-Common Cough (after 48 hours)</td>
<td>□</td>
<td></td>
</tr>
<tr>
<td>Non-Common Cough (after 48 hours)</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Cough with a cold</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Cough with a cold</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Cough with a cold</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Cough with a cold</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>

Please consult a healthcare provider for appropriate diagnosis and treatment.

*Antibiotics Aren't Always the Answer*

[www.cdc.gov/getsmart](http://www.cdc.gov/getsmart)
Antibiotic resistance is related to our prescribing habits

Many RTIs **do not** require antibiotics

Educate your patients about their illnesses and both of the above

Diagnose specifically – categorize illness

Appropriate spectra and duration are important when prescribing for any infection

Stay up-to-date with the guidelines
Clinical Practice Guideline References

RTIs in general

Otitis Media – AAP/AAFP
AAP Subcom Dx and Mgt AOM. *Pediatrics* 2013 131:e964

Sinusitis – IDSA
Chow AW et al. *Clin Infect Dis* 2012;54(8):e72

Pharyngitis - IDSA
Clinical Practice Guideline References

**Skins and Soft Tissue Infection**

**Urinary Tract Infection - Adult - IDSA**

**Urinary Tract Infection - Children - AAP**

**Pneumonia in Adults – IDSA/ATS**

**Pneumonia in Children – PIDS/IDSA**
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  - Arkansas
  - Oklahoma
  - Missouri
  - Puerto Rico

- **Antibiotic Stewardship Lead**
  - Susan Purcell
    susan.purcell@area-b.hcqis.org
    - 512.334.1702

- **Quality Insights**
  - Delaware
  - Louisiana
  - New Jersey
  - Pennsylvania
  - West Virginia

- **Antibiotic Stewardship Lead**
  - **Eve Esslinger**
    eesslinger@qualityinsight.org
    - 1.877.346.6180 | ext. 7685
QIN-QIO Coverage and Contact

• Atlantic QIN
  – New York
  – District of Columbia
  – South Carolina
• Antibiotic Stewardship Lead
  – Lisa Nanton
  – (Direct) 410.872.9662

• For all other states
  – https://qioprogram.org/locate-your-qio?map=qin
  – Select your state
  – You will be provided with your QIN contact information
Urgent Care Association
Contact

Please reach out to Carla Jamison at:

cjamison@ucaoa.org
Be on the look out for another upcoming webinar!

Antibiotic Stewardship in Urgent Care: Easing the Pain for Clinicians and Patients

December 11, 2018
1:00 PM – 2:00 PM

Speaker- Dr. Joseph Toscano
Captures valuable data such as:
• Pre and post tests
• Knowledge checks
• Surveys

Learners’ course specific reports:
• Test responses
• Activity completions
• Feedback
• Number of Attempts

Access at Learning4Quality.org
Questions, comments, or concerns, email: learning@healthcentricadvisors.org
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