Improving Antibiotic Prescribing—What You Need to Know and Where to Find it

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Disclosures

• No financial disclosures.
• I recently transitioned from Montefiore/ Einstein to a position at CDC here with NYSDOH.
• I will be sharing insights and projects from both perspectives.
Scope of the Problem

• ≥ 50% of outpatient antibiotics are unnecessary or inappropriate

• Roughly 75% of adults receive antibiotics for acute bronchitis, this has not changed in > 20 years

• Most acute respiratory illnesses (ARIs) are due to viruses; antibiotics provide no benefit

• Providers agree that resistance and overuse is a problem, but not in their practice

• 1/5 ER visits for adverse drug events are caused by antibiotics

Gerber et al. JAMA. 2016; 315 (6): 558-59
http://www.cdc.gov/getsmart/community/for-hcp/outpatient-hcp/adult-treatment-rec.html

Hicks L et al. Clin Infect Dis. 2015. 60 (9):1308-16
Objectives

• Use cases to review guidelines for common adult antibiotic prescribing
• Local Prescribing Data
• Tools
• Local projects and strategies
Case 1: Your first patient of the day…

Is a 25 year-old female kindergarten teacher with no significant history except recurrent URIs and sinusitis up to 4-5 episodes per year over the past 2 years. She now presents with a week of thick, yellow nasal discharge, a scratchy throat and frontal headache. Temperature in office is 99°F. She has received antibiotics for similar infections in the past and is requesting antibiotics on today’s visit.

What do you do next?

A) Give her a “Z-pack”
B) Give her oseltamivir
C) Do a rapid group A strep test and give her amoxicillin
D) Reassure

What if she returns 4 days later with similar symptoms?
Rhinosinusitis
(“URI” or the “common cold”)

• Bacterial infections complicate only ~2%
• ~98% are caused by respiratory viruses (rhinovirus, coronavirus, parainfluenza, adenovirus, RSV, and influenza)
• Symptoms may last up to 14 days (average 7-11 days)
• Purulent nasal secretions do not predict bacterial infection unless high fevers also present
• Antibiotics do not shorten illness or prevent secondary bacterial infection

https://www.cdc.gov/antibiotic-use/community/for-hcp/outpatient-hcp/adult-treatment-rec.html
Signs of Bacterial Rhinosinusitis

1. Persistent symptoms > 10 days that are NOT improving
2. High fever (at least 39°C or 102°F) and purulent nasal discharge for at least 3-4 days
3. Initial viral URI with sudden worsening after 5-6 days (“double sickening” “double worsening”)

- **Primary bacterial pathogens**: *Streptococcus pneumoniae*, *Haemophilus influenzae*, *Moraxella catarrhalis*, *Streptococcus pyogenes*, *Staphylococcus aureus*
- First line: amoxicillin/ clavulanate, doxycycline (penicillin Allergic)
- NOT macrolides

IDSA Acute Bacterial Rhinosinusitis Guidelines 2012
https://www.cdc.gov/antibiotic-use/community/for-hcp/outpatient-hcp/adult-treatment-rec.html
Letter to Prescribers

Dear Provider:

The Centers for Disease Control and Prevention (CDC) and the New York State Department of Health (Department) are working together to curb the overprescribing of antimicrobial agents.

Recently, the Department performed an analysis of statewide adult outpatient Medicaid claims data from 2013. Based upon this analysis, your practice has been identified as being located in an area of New York State that has an unexpectedly high rate of potentially avoidable antibiotic prescribing. Please see the enclosed map.

NYSDOH analyzed 2013 Medicaid claims data to determine NY counties where there is a high rate of avoidable antibiotic prescribing.

Based on analysis, NYSDOH sent “Dear Provider” letters to all potential antibiotics prescribers in high-prescribing counties.
Potentially Avoidable Outpatient Acute Upper Respiratory Infection Antibiotic Prescribing, Adjusted Rates by County New York Medicaid Adults 18-64 years old
“Be Antibiotics Aware: Smart Use, Best Care”

- CDC campaign to “improve antibiotic prescribing and use and to help combat antibiotic resistance”
CDC’s “Be Antibiotics Aware”

Symptom Relief for Viral Illnesses

1. DIAGNOSIS
   - Cold or cough
   - Middle ear fluid (Earache Media with Effusion, OME)
   - Flu
   - Viral sore throat
   - Bronchitis
   - Other:

2. GENERAL INSTRUCTIONS
   - Drink extra water and fluids.
   - Use a cool mist vaporizer or saline nasal spray to relieve congestion.
   - For sore throats in older 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:
   - Use pain:
   - Sore throat and congestion:

4. FOLLOW UP
   - If not improved in ___ days/hours, if new symptoms occur, or if you have other concerns, please call or return to the office for a recheck.

Reactions from antibiotics cause:
1. In 0-10 medication-related visits to the emergency department. In children, reactions from antibiotics are the most common cause of medication-related emergency department visits.

To learn more about antibiotic prescribing and use, visit www.cdc.gov/antibiotics.
New York Initiatives

• Medicaid mapping project
• “Smart Use Guarantee” poster for providers
New York Initiatives

- Antibiotic prescribing guidelines
UHF Outpatient Antibiotic Stewardship Initiative

- Learning collaborative
- Focus on outpatient setting with focus on ARIs
- 9 hospitals/health systems & their 31 hospital owned practices participated in Stage I.
- 3 Activities:
  1) Patient prescribing
  2) Survey ASP activities
  3) Survey prescriber perceptions
Stage I Findings

Prescribing:
• Overall rate of prescribing for ARIs was 37% (17%-71%)
• English speaking patients, commercially insured patients & patients with > 3 comorbidities, were prescribed more antibiotics
• Prescribing not consistent with clinical guidelines
• Attending physicians comprised <50% of all the prescribers, they prescribed close to 75% of the antibiotics

ASP Activities / Perceptions:
• Minimal outpatient antibiotic stewardship activities reported
• Few (7%) providers cited patient satisfaction/expectation as a factor that influences decision to prescribe
Types of Antibiotic Prescriptions (n=374)

- Macrolides, 59%
- Fluoroquinolones, 10%
- Amoxicillin/Clavulanate...
- Other, 14%
Factors that Impact Decision toPrescribe Antibiotics

- Illness severity: 91%
- Practice guidelines: 83%
- Patient medical history: 75%
- Concern for antibiotic resistance: 35%
- Patient request and satisfaction: 7%
- Patient compliance: 6%
- Time pressure: 2%
- Sample access: 1%
Example of Health System Using the Data

ARI Codes Distribution by Practices/Clinics

ARI % Coding

J40 Bronchitis, not specified as acute or chronic
J06.9 Acute URI, unspecified
J00 Acute nasopharyngitis [common cold]
TOOLS IN ACTION!

https://www.youtube.com/watch?v=OWJcrRHnFEg
Case 2

• Your 2\textsuperscript{nd} patient is a 25 year old female with no PMH, sexually active with one male partner, reports 4 episodes of UTI in the past year with onset of symptoms usually after sexual intercourse with condoms. She’s had several prior courses of ciprofloxacin.

• She now presents with dysuria and suprapubic tenderness. She has no fevers or flank pain on exam. She tried some left over cipro but it is not working. Urine dipstick shows +leukocyte esterase and nitrites.

• What would you prescribe?
## Recommendations

### Acute uncomplicated cystitis

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Management</th>
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<tbody>
<tr>
<td>Nitrites and leukocyte esterase are the most accurate indicators of acute</td>
<td>First-line therapy in healthy non-pregnant, premenopausal women:</td>
</tr>
<tr>
<td>uncomplicated cystitis</td>
<td>- nitrofurantoin 100 mg PO 2x/day x5 days (nitrofurantoin is NOT recommended</td>
</tr>
<tr>
<td>Antibiotic treatment of asymptomatic bacteriuria is NOT recommended for</td>
<td>if suspicious for early pyelonephritis)</td>
</tr>
<tr>
<td>healthy adults EXCEPT:</td>
<td>- TMP-SMX 160/800 mg PO (one DS tablet) 2x/day x3 days (where local</td>
</tr>
<tr>
<td>• pregnant women</td>
<td>resistance is &lt;20%)</td>
</tr>
<tr>
<td>• before some urological procedures</td>
<td>- fosfomycin 3g PO x1 dose</td>
</tr>
<tr>
<td></td>
<td>Reserve fluoroquinolones (e.g. ciprofloxacin) for situations</td>
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<td>in which other agents are NOT appropriate.</td>
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<td>See references for additional treatment options and other</td>
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<td>important information especially if early pyelonephritis is</td>
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<td></td>
<td>suspected.</td>
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[https://www.health.ny.gov/publications/1174_8.5x11.pdf](https://www.health.ny.gov/publications/1174_8.5x11.pdf)
Has a local antibiogram ever impacted your prescribing patterns?

A. Never  
B. Sometimes  
C. Always  
D. What is an antibiogram anyway?
“Antibiograms- The 101 Course”

**Uses:**
- Trends
- Estimates of likelihood that pathogens will be susceptible to common drugs
- Empiric regimen (with clinical info):
  - When no cultures available
  - When pathogen only available (before susceptibility data)

**Limitations:**
- Includes only patients with cultures
- May not be generalizable
- Does not give clinical presentation
- Only 1 factor (not replacement for clinical judgement)
- Patient’s own cultures should inform directed therapy
# NEW YORK CITY ANTIBIOTIC SENSITIVITY

## 2016 OUTPATIENT URINARY TRACT INFECTIONS

### BRONX

#### ADULTS (≥21 YEARS)

<table>
<thead>
<tr>
<th>Bacterial Isolates</th>
<th>Adults Medial</th>
<th>Amoxicillin</th>
<th>Ampicillin/abx</th>
<th>Cefdinir</th>
<th>Ceftriaxone</th>
<th>Ciprofloxacin</th>
<th>Levofloxacin</th>
<th>Nitrofurantoin</th>
<th>Trimethoprim/sulfamethoxazole</th>
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### CITYWIDE

#### ADULTS (≥21 YEARS)

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<th>Amoxicillin</th>
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## PEDIATRICS (<21 YEARS)

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<td>95</td>
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<td>100</td>
<td>96</td>
<td>100</td>
<td>0</td>
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</table>
Urine culture returns 48 hours later with the following result...  
>100 K *Escherichia coli*  

<table>
<thead>
<tr>
<th>Drug</th>
<th>MIC</th>
<th>Interpretation</th>
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<tbody>
<tr>
<td>Ampicillin</td>
<td>&gt;16</td>
<td>R</td>
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<tr>
<td>Amikacin</td>
<td>&lt;=4</td>
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<tr>
<td>Piperacillin/tazobactam</td>
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<td>R</td>
</tr>
<tr>
<td>TMP/SMX</td>
<td>&gt;2/38</td>
<td>R</td>
</tr>
</tbody>
</table>
Case 3

60 year old female with 3 days of an enlarging, painful lesion on her right leg, looks like a boil that she attributes to a “spider bite.”
T 98, BP 120/70, P 80

What is the appropriate management?
A. Incision & drainage (I&D) alone
B. I&D PLUS oral anti MRSA antibiotic
C. Oral anti MRSA antibiotic

Case from Y. Guo, Montefiore ASP
Abscesses

- Incision and drainage is the primary treatment
  - I&D alone likely adequate for simple abscesses/boils

- Do antibiotics provide additional benefit?
  - Multiple, observational studies: high cure rates with or without antibiotics
  - 3 RCTs of uncomplicated skin abscesses

![Graph showing the comparison between antibiotic and placebo treatments for abscesses.]

- Rajendran et al. AAC 2007; 51:4044-8
Conditions in Which Antibiotic Therapy is Recommended After Incision and Drainage

- Signs and symptoms of systemic illness
- Abscess in area difficult to drain completely
- Associated comorbidities or immunosuppression
- Associated septic phlebitis
- Extremes of age
- Lack of response to incision and drainage alone
- Severe or extensive disease

Case 4

60 year old female presents with erythema of her right arm over the past 48 hours. It’s tender and warm to touch. There is no purulent drainage or abscess. No complaint of joint involvement.
T 98.2, BP 130/72, P 77

What is the appropriate management?
A. Clindamycin 450mg oral Q8 Hrs
B. Cephalexin 500mg oral Q 6 Hrs, response & add TMP/ SMX if no response
C. Cephalexin 500mg oral PLUS SMX 2 DS oral Q12Hrs

Case from Y. Guo, Montefiore ASP
Nonpurulent SSTIs

Cellulitis with no purulent drainage or exudate
Empiric treatment for β-hemolytic strep is recommended
  • Prospective study with 248 hospitalized patients
    – 73% due to β-hemolytic strep
    – 96% response rate to β-lactam antibiotics
  • Multicenter, double-blind, randomized study with 500 patients
    – Clinical cure rate: cephalexin + TMP/SMX 84% vs. cephalexin 86%

Recommendations

• Cellulitis with purulent drainage/exudate
  – I&D is recommended
  – Empiric therapy for CA-MRSA is recommended
  – Empiric therapy for β-hemolytic strep unlikely needed

  – Duration: 5-7 days, based on clinical response

• Cellulitis with no purulent drainage or exudate
  – Add empiric treatment for MRSA if:
    • Fails to respond to β-lactam antibiotics
    • Patients with systemic infection

  – Duration: 5-7 days, based on clinical response
What Can You Do to Promote Judicious Prescribing?

• Be aware of the issues of over prescribing
• Be an ASP champion with other prescribers, patients/family
  – Messaging when no antibiotics are needed
  – When they are needed, to take as directed
• Understand local prescribing data
• Know what resources are available for individual prescribers (e.g., guidelines, tools, local microbiology)
• Know the guidelines
  – When no antibiotics are needed
  – When narrower antibiotics can be used
• Keep checking our NYSDOH AR website for updated resources and tools: www.health.ny.gov/antibioticresistance