Sniffle, Sneeze...No Antibiotics Please: Ambulatory Stewardship Strategies for Acute Respiratory Infections (ARI)

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What is Antimicrobial Stewardship?

✓ A program to improve antibiotic use:
  • Optimize clinical outcomes
  • Reduce adverse events
  • Reduce healthcare costs while maintaining quality of care

✓ Federal agenda by 2020:
  – All acute care hospitals will have stewardship
  – Cover all healthcare settings
  – 30% reduction of “inappropriate” antibiotic use
Outpatient Stewardship

• Coordinated efforts promoting appropriate prescribing of antibiotics for non-hospitalized patients
  – Promote adherence to clinical practice guidelines
  – Provide the best care
  – Minimize untoward effects (resistance, *C. difficile*, antibiotic-related complications)
Scope of the Problem

• ≥ 50% of outpatient antibiotic are **unnecessary** or **inappropriate**
• > 60% of antibiotic **expenditures** in US occurs in the outpatient setting
• Roughly **75% of adults** receive antibiotics for acute bronchitis, this has not changed in > 20 years
• Most 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
A decade’s difference: Doctor visits resulting in antibiotic prescription

1995–96 vs. 2005–06

- Ear Infections: 77.1% vs. 70.8%
- Colds: 52.1% vs. 37.3%
- Bronchitis: 74.8% vs. 57.3%
- Sore Throats: 68.6% vs. 46.5%
- Sinusitis: 69.9% vs. 61.8%

Data Source: National Ambulatory Medical Care Survey and National Hospital Ambulatory Medical Care Survey

All trends shown are significant (p < 0.05)
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 and frontal headache. Temperature in office is 99F. She has received antibiotics for similar infections in the past and is requesting antibiotics on today’s visit.
Antibiotics – Yes or No?
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

www.cdc.gov/getsmart
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”)

- **Primary bacterial pathogens:** *Streptococcus pneumoniae*, *Haemophilus influenzae*, *Moraxella catarrhalis*, *Streptococcus pyogenes*, *Staphylococcus aureus*

IDSA Acute Bacterial Rhinosinusitis Guidelines 2012
http://www.cdc.gov/getsmart/community/for-hcp/outpatient-hcp/adult-treatment-rec.html (In your packet)
Strategies for Decreasing Antibiotic Use

• Education of patients and providers
• Treatment guidelines and algorithms
• Signing pledges to prescribe appropriately
• “Antibiotic justification notes” in EMR
• Feedback to providers on performance stats
• Text messaging to patients
• Twitter chats
ARI Systematic Reviews

**Ranji et al. Med Care. 2008:** 43 studies on QI strategies to reduce abx prescribing
- No single or combination strategy was clearly superior
- Active clinician education strategies trended toward greater effectiveness ($P = 0.096$)
- Strategies targeting management of all ARIs (rather than single conditions in single age groups) appeared to give larger reductions in community-level antibiotic use

**Arnold et al. Cochrane Database. 2005:** 39 studies with various AS strategies:
- Combined physician, patient and public education was the most successful in reducing antibiotic prescribing for inappropriate indications
- Interactive education was more effective than didactic lectures
- Patient-based interventions, such as delayed prescriptions reduced antibiotic use and did not result in excess morbidity
• Meeker et al. JAMA 2016: 47 practices in Boston or LA, 248 clinicians
• 3 behavioral interventions triggered when abx ordered for ARI; each site randomized to 0,1,2,3:
  – Pop-up stating abx not indicated, alternatives suggested
  – Accountable justification in EMR
  – Peer comparison – “high performer” vs. “not a top performer” based on inappropriate prescribing rate
• Over 18 months, inappropriate prescribing decreased substantially in both control (11%) and intervention groups (16-18%)
• Absolute between-group reductions in prescribing were only ~5%
• Statistically significant differences noted in accountable justification group (7%, P < .001) and peer comparisons group (5.2%, P < .001)
• No significant increase in infectious complications

• Wide variation in antibiotic prescribing rates by US state

• Rates further characterized by geography, specialty, patient population, SES
  – Oral antibiotics dispensed in 2011 extracted from IMS Health Xponent data (captures >70% of US outpatient prescriptions)
  – Prescribing rates calculated using census denominators
  – 262.5M antibiotic courses prescribed in 2011 (842 scripts per 1000 persons) among all age groups
Community Antibiotic Prescribing Rates by State (2013/2014)*

50% of all antibiotics prescribed in U.S. health provider offices are either unnecessary or inappropriate

*Antibiotic prescriptions per 1000 persons
Prescribing data from 2014; population data from 2013
Source: IMS Health

Hicks L et al. Clin Infect Dis. 2015. 60 (9):1308-16
Most commonly prescribed individual antibiotic was **azithromycin**

**Family practitioners** prescribed the most antibiotic courses (24%)

Highest prescribing rates noted in the **South census region** (931 scripts/1000 persons vs. 647 scripts/10000 persons; \( P < .001 \)) among all age groups

High county-level prescribing associated with:
- Increased prescribers per capita
- Lower per capita income
- Higher obesity rates
May 3, 2016 JAMA study by CDC investigators in partnership with Pew Charitable Trusts

**Aim:** to determine proportion of 262M outpatient antibiotic prescriptions dispensed in 2011 that were inappropriate and amenable to reduction

Data on prescriptions by age and diagnosis extracted from 2010-2011 NAMCS and NHAMCS

184,032 visits sampled – **12.6% resulted in an antibiotic prescription**

Appropriateness judged by national guidelines and regional variability

Collectively, ARI lead to **221 prescriptions/1000 population**

- Sinusitis (56/1000), supp. OM (47/1000), and pharyngitis (43/1000)
- **Only 111/1000 appropriate, or roughly ½**
  - ~34M antibiotic prescriptions annually

Across all conditions, roughly 30% of prescriptions may have been inappropriate

**Strong case for ambulatory stewardship**

_Fleming-Dutra et al. JAMA. 2016;315(17):1864-1873_
Improve Antibiotic Use to Combat Antibiotic Resistance

70% Necessary Prescriptions
(Still need to improve drug selection, dose and duration)

At least 30% Unnecessary Prescriptions

In U.S. Doctor’s Offices and Emergency Departments

CDC is working to reduce unnecessary antibiotic use
White House National Action Plan to Combat Antibiotic-Resistant Bacteria (CARB)
Goal: By 2020, reduce inappropriate outpatient antibiotic use by 50%

Find out when antibiotics are necessary.
Visit: http://www.cdc.gov/getsmart
Note to Educated Consumers (and Prescribers)

How to Stop Overprescribing Antibiotics

ANTIBIOTICS are an indispensable weapon in every physician’s arsenal, but when prescribed unnecessarily for nonbacterial infections like the common cold, as they too often are, they provide no benefit and create problems. They wipe out healthy bacteria and can cause side effects like yeast infections and allergic reactions. Worse still, they contribute to the rise of “superbugs” that resist antibiotic treatment.
Examples of Successful Interventions

• Audit and Feedback
  – Compare individual prescribing to coworkers or an established benchmark

• Clinical Decision Support

• Communication

Always combined with Education
Audit and Feedback (Report Cards)

18 pediatric practices in NJ and PA evaluating rates of “off-guideline” prescribing practices for ARI

Education followed by personalized quarterly feedback for 1 year

Decreased broad-spectrum antibiotic prescribing from 26.8% to 14.3%

Gerber JS et al. JAMA. 2013; 309(22) 2345-52
Clinical Decision Support

LESS IS MORE

A Cluster Randomized Trial of Decision Support Strategies for Reducing Antibiotic Use in Acute Bronchitis

UNFORTUNATELY, NO AMOUNT OF ANTIBIOTICS WILL GET YOU OVER A COLD OR THE FLU. THE BEST WAY TO TREAT MOST COLD SYMPTOMS IS TO DRINK LOTS OF FLUIDS AND REST. FOR MORE ADVICE, VISIT WWW.CDC.GOV/GOALSFORGETTING.

WARNING: Antibiotics don't work for viruses like colds and the flu. Using them for viruses will NOT make you feel better or get back to work faster.

Antibiotics are strong medicines. Keep them that way. Prevent antibiotic resistance. Antibiotics don't fight viruses—they fight bacteria. Using antibiotics for viruses can put you at risk of getting a bacterial infection that is resistant to antibiotic treatment. Talk to your healthcare provider about antibiotics. Visit www.cdc.gov/getsmart or call 1-800-CDC-INFO to learn more.

Taking antibiotics for viral infections such as a cold, a cough, or the flu will NOT:
• Cure the infection
• Keep other people from catching it
• Help you feel better
Letter of Commitment (Antibiotic “Nudging”)

We want to give you some important information about antibiotics. Antibiotics, like penicillin, fight infections due to bacteria that can cause some serious illnesses. But these medicines can cause side effects like skin rashes, diarrhea, or yeast infections. If your symptoms are from a virus and not from bacteria, you won’t get better with an antibiotic, and you could still get these bad side effects.

Antibiotics also make bacteria more resistant to them. This can make future infections harder to treat. This means that antibiotics might not work when you really need them. Because of this, it is important that you only use an antibiotic when it is necessary to treat your illness.

How can you help? Carefully follow your doctor’s instructions. He or she will tell you if you should or should not take antibiotics.

When you have a cough, sore throat, or other illness, your doctor will help you select the best possible treatments. If an antibiotic would do more harm than good, your doctor will explain this to you, and may offer other treatments that are better for you.

Your health is very important to us. As your doctors, we promise to treat your illness in the best way possible. We are also dedicated to avoid prescribing antibiotics when they are likely to do more harm than good.

If you have any questions, please feel free to ask your doctor, nurse, or pharmacist.
Putting the pieces together

• **The takeaway:**
  – ARIs account for the most outpatient antibiotic over use
  – CDC has guidelines for what to treat (and not treat)
  – No one AS or QI strategy is superior
  – Active strategies engaging providers and patients is most successful

• **Our plan** is to help each facility self-assess:
  – Your antibiotic use for ARI
  – Strategies already in place
  – Your prescribers perceptions & attitudes
  – Plan your pilot Stewardship strategies
Thank You

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“It’s a prescription for one of those new super-antibiotics. You won’t just get better, you’ll get even.”

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