Expanding Antimicrobial Stewardship into the Outpatient Setting

Michael E. Klepser, Pharm.D., FCCP
Professor Pharmacy Practice
Ferris State University
College of Pharmacy

Objectives

- List the Healthy People 2020 immunization goals for select vaccines.
- Summarize the data regarding immunizations and the subsequent impact on antibiotic use and susceptibility patterns.
- Develop strategies to improve immunization rates among patients.

Outpatient Antibiotic Use

- Approximately 450 million physician office visits annually.
  - >150 million result in prescription of an antibiotic
  - 60%-80% of antibiotic use occurs in the outpatient setting
- High rates of misuse.
  - 80% of adults with rhinosinusitis and >60% of adults with pharyngitis get antibiotics

Outpatient Antibiotic Use

- National average was 833 antibiotic prescriptions per 1,000 persons.
- Penicillins and macrolides were the most frequently prescribed antibiotics.

Outpatient Antibiotic Use

- It has been estimated that as much of 50% of outpatient antibiotic usage is inappropriate (i.e., wrong agent, dose, duration).
- More than 25% of antibiotics in the ambulatory care setting are for conditions for which antibiotics are rarely indicated (i.e., bronchitis, acute sinusitis).
  - 38%-49% of residents got an antibiotic for the common cold.

Outpatient Antibiotic Use

Prescribing antibiotics

- Percentage of visits for visits that resulted in antibiotic prescriptions
- 68%

- When comparing providers, 95% prescribed antibiotic for an infection
- 95% of prescriptions...
- 40% of these visits were...
- 40%
Outpatient Antibiotic Use

Infections prone to misuse of antibiotics
- Upper respiratory tract infections
- Urinary tract infections
- Pneumonia
- Skin and skin structure infections

Outpatient Antibiotic Use Drivers

- Patient persistence
  - May not be as big as previously thought.
- Prescriber lack of familiarity/adherence with treatment guidelines
- Lack of and use of diagnostic tools and microbiology data at the point of care
- Provider shortage
  - Pressure to see more patients
- Poor patient follow-up
  - Dismiss and done
- Free antibiotic programs
  - Remove a barrier to antibiotic access
  - Create a pressure to use agent suboptimal spectra of activity
- Fear
  - Missing something
  - Litigation
  - Visit to a prescriber

Antibiotic Use and Resistance

Numerous studies have correlated antibiotic consumption with emergence of resistance.
- Resistance has been linked with:
  - Increased infection-related mortality
  - Increased cost ($20 billion excess treatment costs)
  - Increased use of broad spectrum agents

Impact of Outpatient Antibiotic Use

Adverse effects associated with antibiotics are the most common drug-related causes for emergency department visits among individuals less than 18 years of age.
- Responsible for one out of every five drug-related emergency department visits for all patients

Antimicrobial Stewardship in the Outpatient Setting

The White House recently published two documents that focus on combating antibiotic resistance.
- September 2014 “National Strategy for Combating Antibiotic-Resistant Bacteria”

https://www.whitehouse.gov/sites/default/files/docs/carb_national_strategy.pdf
https://www.whitehouse.gov/sites/default/files/docs/national_action_plan_for_combating_antibiotic‐resistant_bacteria.pdf
Proposed actions:

1. Prevent infections and prevent the spread of resistance by promoting immunizations, hand washing, and appropriate use of antibiotics.
2. Track resistant bacteria and utilize information to optimize therapies.
3. Improve the use of antibiotics through antimicrobial stewardship.
4. Promote the development of new antibiotics and new diagnostic tests for resistant bacteria.

Actions to support the core elements should be implemented at clinician- and clinic/system-levels.

Should also develop and implement actions at the patient-level.

Goal 1 - Slow the emergence of resistant bacteria and prevent the spread of resistant infections.

Objective 1 - Implement public health programs and reporting policies that advance antibiotic-resistance prevention and foster antibiotic stewardship in healthcare settings and the community.

Implementation steps:

- Strengthen antibiotic stewardship in inpatient, outpatient, and long-term care settings.
- Implement annual reporting of antibiotic use in inpatient and outpatient settings and identify geographic variations and/or variations at the provider and/or patient level that can help guide interventions.

Goal 2 - Foster antibiotic stewardship in healthcare settings and the community.

Objective 2 - Strengthen antibiotic stewardship in inpatient, outpatient, and long-term care settings.

Implementation steps:

- Verify inappropriate outpatient antibiotic use for monitored conditions/agents will be reduced by 50% from 2010 levels.
- Do you have any idea how to determine which antibiotics were used your clinics in 2010?
- Do you know how much antibiotics were used in your clinics in 2010?
- Where should we start to achieve this anticipated outcome?

Anticipated outcome by 2020

- Inappropriate outpatient antibiotic use for monitored conditions/agents will be reduced by 50% from 2010 levels.
- What should we be doing to achieve this outcome?

National Goals for Antimicrobial Stewardship

CDC Core Elements for Outpatient Stewardship

- Proposed actions:
  1. Prevent infections and prevent the spread of resistance by promoting immunizations, hand washing, and appropriate use of antibiotics.
  2. Track resistant bacteria and utilize information to optimize therapies.
  3. Improve the use of antibiotics through antimicrobial stewardship.
  4. Promote the development of new antibiotics and new diagnostic tests for resistant bacteria.

Actions to support the core elements should be implemented at clinician- and clinic/system-levels.

- Should also develop and implement actions at the patient-level.

Influenza Vaccination Coverage

Influenza Vaccination and Antimicrobial Stewardship

- Approximately 25% increase in antibiotic use in winter months.
- Correlates with increases in influenza-like illness.
- An excess of 7 million antibiotic prescriptions each year linked to influenza.
Influenza Vaccination and Antimicrobial Stewardship

- In 2016-17
  - There were 700,000 visits for influenza-like illness.
  - Vaccine reduced a vaccinated person's risk of getting sick and having to go to the doctor because of influenza by about half (48%).

Patients with influenza are at increased risk of developing a secondary bacterial infection.
- *S. pneumoniae* is most common pathogen.
- Mortality can be reduced by 30% with pneumococcal vaccine.
- Antibiotics are inappropriately prescribed for patients with influenza-like illness.

Adult Pneumococcal Vaccination

<table>
<thead>
<tr>
<th>Vaccination Year</th>
<th>Pneumococcal, HR 19-64yrs</th>
<th>Pneumococcal, ≥65 yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>2013</td>
<td>2012</td>
</tr>
<tr>
<td>2013</td>
<td>2014</td>
<td>2013</td>
</tr>
<tr>
<td>2012</td>
<td></td>
<td>2012</td>
</tr>
</tbody>
</table>

% Vaccinated

Data Source: 2012, 2013 and 2014 NHIS

Pneumococcal Vaccination and Antimicrobial Stewardship

- The primary driver behind the receipt of an antibiotic prescription is visit to a physician's office
  - From 2000 to 2001, the PCV7 reduced rates of invasive disease from 80 per 100,000 to 1 per 100,000
  - PCV13 and PPSV23 are effective at reducing rates of invasive disease and possibly pneumococcal pneumonia

Pneumococcal Vaccination and Antimicrobial Stewardship

Pneumococcal Vaccination and Antimicrobial Stewardship

- Between 1998-99 and 2008, penicillin-nonsusceptible IPD rates declined 64% for children aged <5 years and 45% for adults aged ≥65 years\(^1\)
- In 2004, 4 million cases of pneumococcal infections were reported in the United States resulting in an annual direct cost of $3.7 billion\(^2\)
  - Costs associated with treatment of invasive pneumococcal disease has likely decreased proportionately to the reduction of disease


Pharmacists and nurses can play a large role in community antimicrobial stewardship programs by promoting and administering pneumococcal vaccination.

- Vaccine reconciliation
- Patient and provider education
- Engage immigrant and minority populations
- Discuss with newly insured individuals
  - Patients with insurance are more than twice as likely to receive vaccinations

### Infection Continuum

**Pharmacists and Nurses Can Play a Role in Community Antimicrobial Stewardship Programs by Promoting and Administering Pneumococcal Vaccination:**

- **Vaccine Reconciliation**
- **Patient and Provider Education**
- **Engage Immigrant and Minority Populations**
- **Discuss with Newly Insured Individuals**
  - Patients with insurance are more than twice as likely to receive vaccinations

### Summary

- Healthy people are at low risk for antibiotic use.
- Vaccines help people stay healthy and away from prescribers.
- Vaccines are one of our best tools for reducing outpatient antibiotic use.