Antimicrobial Stewardship in the Outpatient Setting (#OutptASP)

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#NebStewardSummit2018
Disclosures

• Neither Dr. Green Hines nor Dr. Marcelin have any financial disclosures or conflicts of interest for this presentation

• Off label use of medications will not be discussed
Objectives

By the end of this presentation, participants should:

1. Identify collaborative stakeholders essential to #OutptASP success

2. Summarize 5 key components of #OutptASP

3. Apply select clinical pathway guidance to syndrome-specific #OutptASP interventions

4. Describe unique challenges in pediatric #OutptASP
What percentage of outpatient antibiotic prescriptions (for any clinical condition) is inappropriate?

a. 10%
b. 20%
c. 30%
d. 40%
e. 50%
National survey ambulatory antibiotic use 2010-2011

Antibiotics prescribed: 12.6%
Rx for URI: 43.7%
50% appropriate

Total Estimated 30% of antibiotic prescriptions unnecessary = 47 million unneeded prescriptions per year

Community Antibiotic Prescriptions per 1,000 Population by State — 2015

Each year 269.4 million antibiotic prescriptions are written in the United States; enough to give 4 out of every 5 people one prescription.

National: 835 antibiotic prescriptions dispensed per 1000 population

Nebraska: 1045 antibiotic prescriptions dispensed per 1000 population

Data source: QuintilesIMS Xponent 2015.
Which of the following is the most commonly prescribed class of antibiotics in adult outpatient clinics?

a. Fluoroquinolones (e.g. levofloxacin)
b. Aminopenicillins (e.g. amoxicillin-clavulanate)
c. Macrolides (e.g. azithromycin)
d. Tetracyclines (e.g. doxycycline)
e. Cephalosporins (e.g. cephalexin)
Appropriateness of antibiotics used for Acute Sinusitis

- IDSA Recommended 1st line or alternative: 64%
- Non-guideline recommended treatment: 36%
- Azithromycin: 24%
- Cephalosporins: 8%
- Other: 4%
Acute Sinusitis: Percent of prescriptions prescribed per course duration (N=3,696,976)

- 3 days: 1.3%
- 5 days: 23%
- 7 days: 5.9%
- 10 days: 66.9%
- 14 days: 2.4%
Why #OutptASP?

Inappropriate antibiotic prescribing in outpatient setting is a **PROBLEM**

WE can readily **FIX** that problem
We have been charged...

To reduce inappropriate outpatient antibiotic prescribing...

By 50% by the year 2020
Where does #OutptASP occur?

Entities that are intended audiences for this report are outpatient health care professionals and leaders of their respective clinics, departments, facilities, and health care systems.

Primary care clinics and clinicians
These clinicians and clinics prescribe approximately half of all outpatient antibiotics in the United States. This includes clinicians specializing in family practice, pediatrics, and internal medicine, all of whom treat a wide variety of patients and conditions that might benefit from antibiotic treatment.

Outpatient specialty and subspecialty clinics and clinicians
These clinics and clinicians focus on treatment and management of patients with specialized medical conditions that sometimes benefit from antibiotic therapy. These specialties include gastroenterology, dermatology, urology, obstetrics, ophthalmology, and others.

Emergency departments (EDs) and emergency medicine clinicians
EDs and emergency medicine clinicians are positioned between acute care hospitals and the community and encounter unique challenges, including lack of continuity of care and higher concentration of high-acute patients, as well as unique opportunities for stewardship interventions, such as greater clinician access to diagnostic resources and the expertise of pharmacists and consultants.

Retail health clinics and clinicians
These clinics and clinicians provide treatment for routine conditions in retail stores or pharmacies and represent a growing category of health care delivery in the United States.

Dental clinics and dentists
Dental clinics and dentists use antibiotics as prophylaxis before some dental procedures and for treatment of dental infections.

Urgent care clinics and clinicians
These clinics and clinicians specialize in treating patients who need to be seen after hours but might not need to be seen in EDs.

Health care systems
Health care systems plan, deliver, and promote health care services and often involve a network of primary and specialty outpatient clinics, urgent care centers, EDs, acute care hospitals, and other facilities that provide health care services. Health care systems can use existing antibiotic stewardship programs or develop new ones to promote appropriate antibiotic prescribing practices in their outpatient facilities as well as across the system.

Let’s Talk about C-DIFF

Collaboration

Follow-up

#OutptASP

Data

Feedback

Interventions
Who is the most important stakeholder for a successful outpatient antimicrobial stewardship program?

a. Primary care physician  
b. Primary care advanced-practice provider  
c. Antimicrobial stewardship team leader (MD/PharmD)  
d. Community pharmacist  
e. Patient  
f. All of these are equally important stakeholders
Who are the #OutptASP stakeholders?

Physicians
Advanced Practice Providers
Institution ASP Team Leaders
Community Pharmacists

The Patient!

Anyone prescribing or dispensing antibiotics in the ambulatory setting
Who are the #OutptASP stakeholders?

- Physicians
- Advanced Practice Providers
- Community Pharmacists
- Institution ASP Team Leaders
- The Patient!

Anyone prescribing or dispensing antibiotics in the ambulatory setting
Commitment
Demonstrate dedication to and accountability for optimizing antibiotic prescribing and patient safety.

Action for policy and practice
Implement at least one policy or practice to improve antibiotic prescribing, assess whether it is working, and modify as needed.

Tracking and reporting
Monitor antibiotic prescribing practices and offer regular feedback to clinicians, or have clinicians assess their own antibiotic prescribing practices themselves.

Education and expertise
Provide educational resources to clinicians and patients on antibiotic prescribing, and ensure access to needed expertise on optimizing antibiotic prescribing.
Role of the ASP team

Recognize opportunities to improve antibiotic prescribing practices by:

☐ Later
☐ Tomorrow
☐ Today
☒ NOW

Who are the #OutptASP stakeholders?

- Physicians
- Advanced Practice Providers
- Institution ASP Team Leaders
- Community Pharmacists

Anyone prescribing or dispensing antibiotics in the ambulatory setting

The Patient!
Know your prescribers

Understand their challenges and resources for #OutptASP

- Pressure to prescribe
- Clinician knowledge gaps
- Inadequate visit time
- Concern about patient satisfaction scores
Patient Presents to Clinic for URI

Provider age ≤30
141 (128-154)

Provider age >50
471 (468-474)

Physicians >50 prescribe 2-4 times more antibiotics than those ≤30

Peds: IRR 4.21; 95% CI, 2.96–5.97 p<.001
Adults: IRR 1.92; 95% CI, 1.19 3.11 p=.008

doi:10.1017/ice.2017.263
Mean Antimicrobial Prescriptions per 1,000 Visits (95% CI) by Indication

Patient Presents to Clinic for URI

Advanced Practice Provider
876 (873–879)

IRR 1.15; 95% CI, 1.03–1.29, p = 0.014

Physician
657 (655–659)

APPs prescribe 15% more antibiotic prescriptions than MDs

doi:10.1017/ice.2017.263
Who are the #OutptASP stakeholders?

- Physicians
- Advanced Practice Providers
- Institution ASP Team Leaders
- Community Pharmacists
- The Patient!

Anyone prescribing or dispensing antibiotics in the ambulatory setting
Community Pharmacists can

☑ Collaborate with physicians on clinical disease management algorithms

☑ Provide just-in-time patient education
  (Am J Health-Syst Pharm—Vol 61 Jul 1, 2004)
Who are the #OutptASP stakeholders?

- Physicians
- Advanced Practice Providers
- Community Pharmacists
- Institution ASP Team Leaders
- Anyone prescribing or dispensing antibiotics in the ambulatory setting
- The Patient!
Mean Antimicrobial Prescriptions per 1,000 Visits (95% CI) by Indication

Patient Presents to Clinic for URI

Metropolitan Clinic

Urban patients prescribed 36% more antibiotics than rural patients

IRR, 1.36; 95% CI, 1.15–1.61 p<0.001

Rural Clinic

Asian and African Americans have 15% lower risk of being prescribed antibiotics than Whites.
Collaboration

Follow-up

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#OutptASP

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Interventions
Which metric is the most useful for measuring success of an outpatient antimicrobial stewardship program?

a. Indication-specific antimicrobial use
b. Drug-specific antimicrobial use
c. Microbe-specific antimicrobial use
d. Prescriber-specific antimicrobial use
e. Other
Q3: What are the best metrics for outpatient antibiotic stewardship? How do we measure success? #OutptASP

- 14% Drug-specific
- 71% Indication-specific
- 13% Bug-specific
- 2% Other

118 votes • Final results

7:21 PM - 6 Mar 2018
Nebraska Medicine: Antibiotic Prescriptions for Acute Bronchitis – By Drug Class

Legend
- Macrolides
- Fluoroquinolones
- Aminopenicillins (amoxicillin, Augmentin)
- Cephalosporin 1st generation
- Cephalosporin 2nd generation
- Cephalosporin 3rd generation
- Bactrim
- Tetracyclines
## Metrics depend on resources

<table>
<thead>
<tr>
<th>Type of Metric</th>
<th>Advantages</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indication-specific</td>
<td>Available guidelines for appropriate vs. inappropriate use</td>
<td>Difficult if indications not required for prescribing</td>
</tr>
<tr>
<td>Drug-specific</td>
<td>Identifies targeted antimicrobial reduction interventions</td>
<td>Confounding if drugs have other uses outside of ID (e.g. minocycline for acne or rheum conditions)</td>
</tr>
<tr>
<td>Bug-specific</td>
<td>Identifies antibiogram gaps and targets for improvement</td>
<td>Outpatient cultures rarely obtained</td>
</tr>
<tr>
<td>Provider-specific</td>
<td>Focused on high-prescribers to make greatest impact in reduction</td>
<td>High effort to create individualized ASP plans; better to do general plan and include peer comparison</td>
</tr>
</tbody>
</table>
Collaboration

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#OutptASP
Outpatient Interventions
Where to begin?

Step 1
Identify conditions in which clinicians commonly deviate from best practices for antibiotic prescribing.
Deviations from Best Practices

- **Antibiotics are not indicated**
  - Acute bronchitis
  - Nonspecific URI
  - Viral pharyngitis

- **Over-diagnosed conditions**
  - Group A Strep pharyngitis
  - Urinary tract infection

- **Wrong agent, dose or duration**
  - Azithromycin rather than amoxicillin for uncomplicated acute bacterial sinusitis

- **Underused watchful waiting or delayed prescribing**
  - Acute otitis media
Outpatient Interventions
Where to begin?

Step 2
Identify barriers that lead to deviation from best practices.
Potential Barriers

- Knowledge gaps
- Perceived pressure to see patients quickly
- Perception of patient expectations for antibiotics
- Concerns about decreased patient satisfaction
Time Constraints

- Start conversation before you see patients
  - Waiting and exam rooms
    - Electronic bulletin boards
    - Posters
    - Posted commitment letter for appropriate antibiotic prescribing
  - Clarify intentions before visit
    - What questions are you hoping to have answered by the doctor today?
- Patient/Family Reading Material
  - Pre-built electronic medical record phrases to provide patient and their family
  - Educational handouts
    - CDC
    - Other hospital/clinic organizations

True or False?

*If a prescriber perceives that a parent desires antibiotic therapy for their child, the prescriber is more likely to prescribe an antibiotic:*

a. True
b. False
Patient Expectations

• Any parent-initiated statement of antibiotics (direct request or indirect mention) increases likelihood that physician perceives parent as expecting antibiotics.

• Perceived patient and parental pressure has been shown to result in increased over-prescribing of antibiotics.

• Physicians are not good at predicting what parents or patients actually expect.

Patient Satisfaction

• Cross-sectional study conducted on >1,000 pediatric ARTI visits

• **Positive** Rx recommendations +/- **negative** Rx recommendations associated with ↓ antibiotic prescribing

You can give ibuprofen to make her comfortable. This is caused by a virus, so antibiotics won’t help.

• Combined **positive** and **negative** Rx recommendations associated with the highest possible visit rating

Outpatient Interventions
Where to begin?

Step 3
Establish standards for antibiotic prescribing.
Standards for Antibiotic Prescribing

National Clinical Practice Guidelines

- Infectious Diseases Society of America
  - idsociety.org/Practice Guidelines/

- Centers for Disease Control and Prevention (CDC)
  - cdc.gov/antibiotic-use/community/for-hcp/outpatient-hcp/adult-treatment-rec.html
  - cdc.gov/antibiotic-use/community/for-hcp/outpatient-hcp/pediatric-treatment-rec.html

- American Academy of Pediatrics
Standards for Antibiotic Prescribing
Facility Specific
Clinical Practice Guidelines & Pathways

Nebraska Medicine
www.nebraskamed.com/for-providers/asp/plans

Urinary Tract Infection and Asymptomatic Bacteriuria
Guidance

Urinary tract infection (UTI) is the most common indication for antimicrobial use in hospitals and a significant proportion of this use is inappropriate or unnecessary. The Antimicrobial Stewardship Program at the Nebraska Medical Center has developed guidelines to facilitate the evaluation and treatment of UTIs.

Ordering of Urine Culture: Urine cultures should only be obtained when a significant suspicion for a UTI exists based on patient symptoms. Urine culture data should always be interpreted taking into account the results of the urinalysis and patient symptoms. In the urinalysis the presence of leukocyte esterase suggests WBC will be present while nitrates suggest that gram-negative organisms are present. Neither of these findings is diagnostic of a UTI.

Indication for urine culture:
- When signs or symptoms suggest a urinary tract infection is present (see below)
- In patients who cannot provide history (intubated, demented) and have sepsis without another source to explain it

<table>
<thead>
<tr>
<th>Type of Infection</th>
<th>Suspected Organisms</th>
<th>Recommended Treatment</th>
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<tbody>
<tr>
<td>Non-puressant cellulitis (no purulent material or wound present)</td>
<td>Most commonly beta-hemolytic Streptococcus (group A strep), Staphylococcus aureus (group C strep), Group C strep, Rarely Staphylococcus epidermidis (notably MRSA)</td>
<td>Mild: Cephalaxin 500mg PO q8h OR Clindamycin 300 mg PO q8h Moderate-severe: Cefazolin 2g IV q8h OR Ceftriaxone 1g IV q24h Severe Penicillin Allergy: Clindamycin 600 mg IV q8h Severe systemic illness or no response/worsening at 48 hours: Consider vancomycin 10-15 mg/kg IV q12h If streptococcal infection confirmed on culture (no PCN allergy): PO: Penicillin VK 500 mg PO q6h OR Ampicillin 2.5g IV q6h IV: Aequuxin Penicillin G 2 MU q4h OR Amoxicillin 3g q12h</td>
</tr>
<tr>
<td>Folliculitis</td>
<td>Typically S. aureus, P. aeruginosa (hot tub)</td>
<td>- Warm compress - Topical antibiotic: Polymyxin/bacitracin ointment - No systemic antibiotics needed</td>
</tr>
<tr>
<td>Impetigo (honey-crusted lesions)</td>
<td>S. aureus, Including CA-MRSA, S. pyogenes</td>
<td>- Warm water soak Limited disease: - Mupirocin topical ointment TID x 7d Extensive disease: Obtain culture: - Cephalexin 500 mg PO q6h (if no MRSA suspected) OR - TMP/SMX DS 1 tab PO q12h OR - Clindamycin 300 mg PO q8h</td>
</tr>
</tbody>
</table>
Standards for Antibiotic Prescribing

Facility Specific Clinical Practice Guidelines & Pathways

Children’s Hospital & Medical Center
Standards for Antibiotic Prescribing

Facility Specific Clinical Practice Guidelines & Pathways

- Children’s Hospital Colorado
  - [www.childrenscolorado.org/health-professionals/clinical-resources/clinical-pathways/](http://www.childrenscolorado.org/health-professionals/clinical-resources/clinical-pathways/)

- Seattle Children’s
Collaboration

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#OutptASP
True or False?

Providing peer comparison for antibiotic prescribing practices can reduce inappropriate antibiotic prescribing:

a. True
b. False
Feedback

- Randomized clinical trial conducted among 10 care offices
- Clinicians received 0, 1, 2 or 3 interventions for 18 months
  - *Suggested alternatives* to antibiotic treatments
  - *Accountable justification*
  - *Peer comparison*
- Antibiotic prescribing guideline education at enrollment
- The two socially motivated interventions resulted in statistically significant reductions in inappropriate antibiotic prescribing

Peer Comparison

CP Amoxicillin/Augmentin Compliance: 92.5%

Departments

Clinics

Definition
Summary
Patients
Collaboration

Follow-up

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The estimate of interest is the treatment × time interaction term, representing the relative changes in trajectories before and during the intervention. Error bars indicate 95% CIs.
A Successful #OutptASP requires

Collaboration  
Follow-up  
#OutptASP  
Data  
Feedback  
Interventions
#NebStewardSummit2018

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