Antimicrobial Stewardship in the Outpatient Setting (#OutptASP)

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#NebStewardSummit2018

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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

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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

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What percentage of outpatient antibiotic prescriptions (for any clinical condition) is inappropriate?

a. 10%

b. 20%

c. 30%

d. 40%

e. 50%

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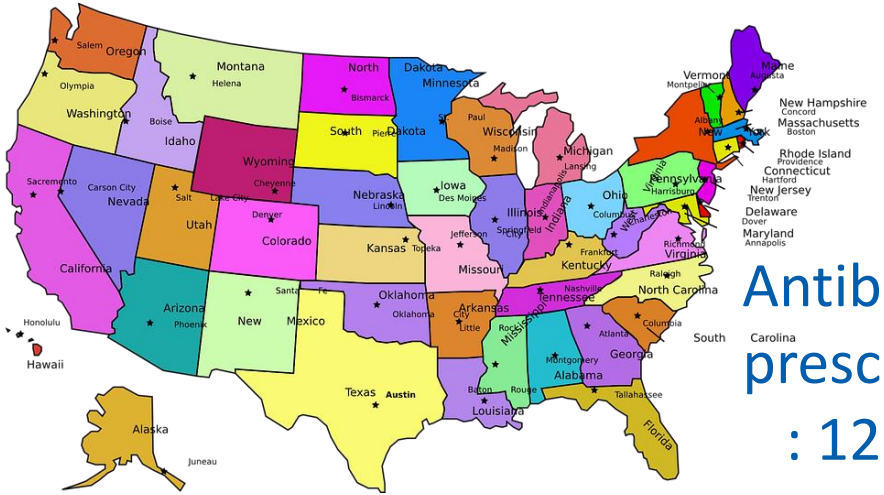
National survey ambulatory antibiotic use 2010-2011



Antibiotics prescribed : 12.6%

Rx for URI: 43.7%

50% appropriate

Flemming-Durata K. *JAMA*. 2016;315:1864-73.

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

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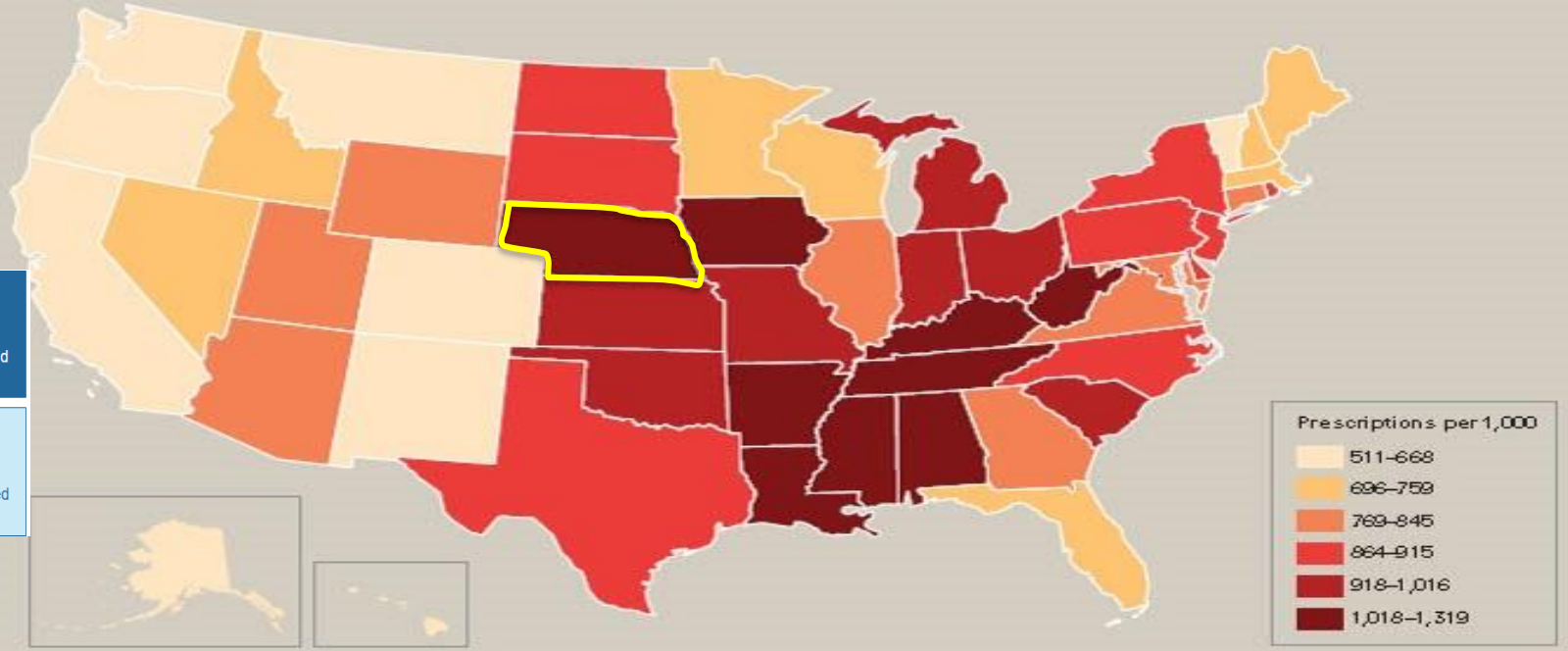
Community Antibiotic Prescriptions per 1,000 Population by State — 2015

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: Quintiles IMS 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)

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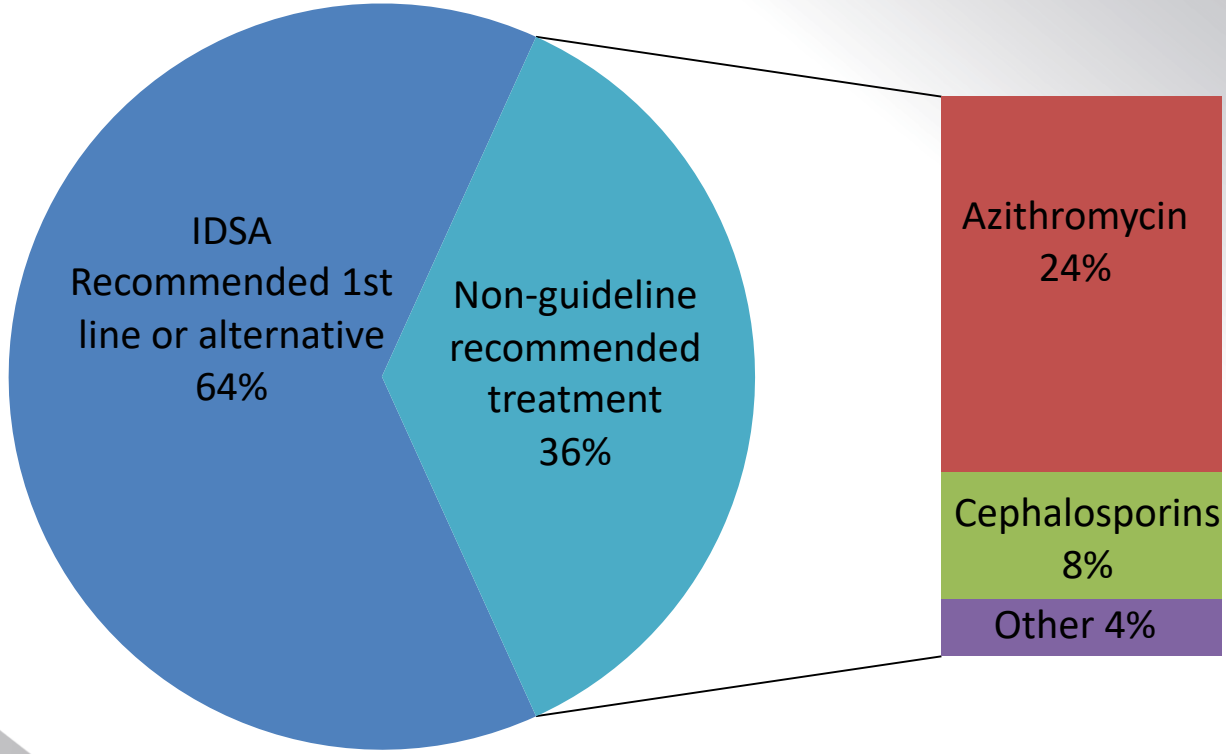
Appropriateness of antibiotics used for Acute Sinusitis



King LM, Sanchez GV, Bartoces M, Hicks LA, Fleming-Dutra KE. Antibiotic Therapy Duration in US Adults With Sinusitis. *JAMA Intern Med.* Published online March 26, 2018. doi:10.1001/jamainternmed.2018.0407

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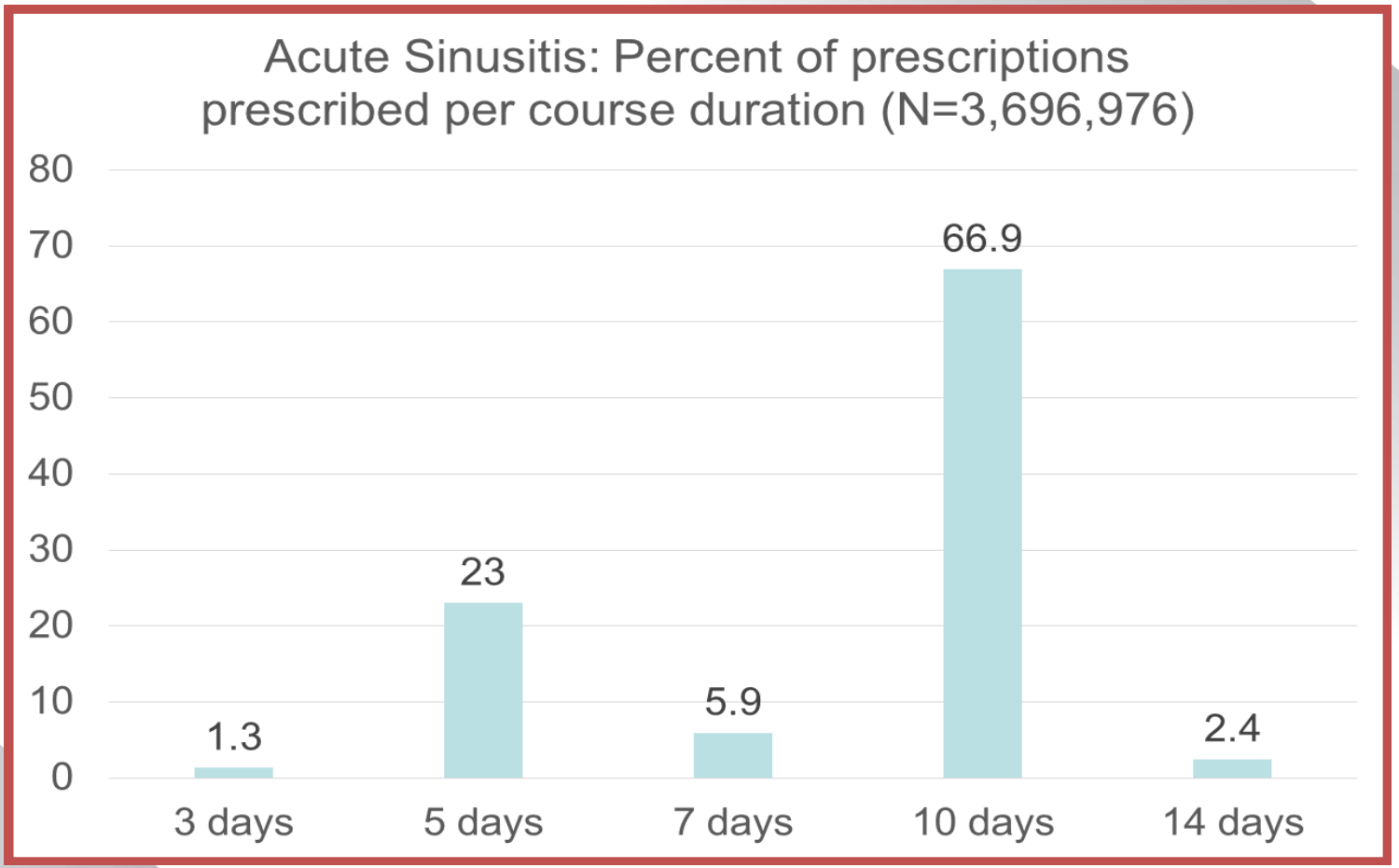

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Why #OutptASP?

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

WE can readily **FIX** that problem

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We have been charged…

To reduce inappropriate outpatient antibiotic prescribing…

By 50% by the year 2020

National Action Plan for Combating Antibiotic-Resistant Bacteria

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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 clinics and clinicians 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 clinics include gastroenterology, dermatology, urology, obstetrics, otolaryngology, 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-acuity 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.

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

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

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.

Nurse practitioners and physician assistants
These clinicians work in every medical specialty and subspecialty involved in antibiotic prescribing and should be included in antibiotic stewardship efforts.

*Source: CDC. Outpatient antibiotic prescriptions—United States, 2013. Atlanta, GA: US Department of Health and Human Services, CDC; 2013. http://www.cdc.gov/getsmart/community/pdfs/annual-reportsummary_2013.pdf

Where does #OutptASP occur?

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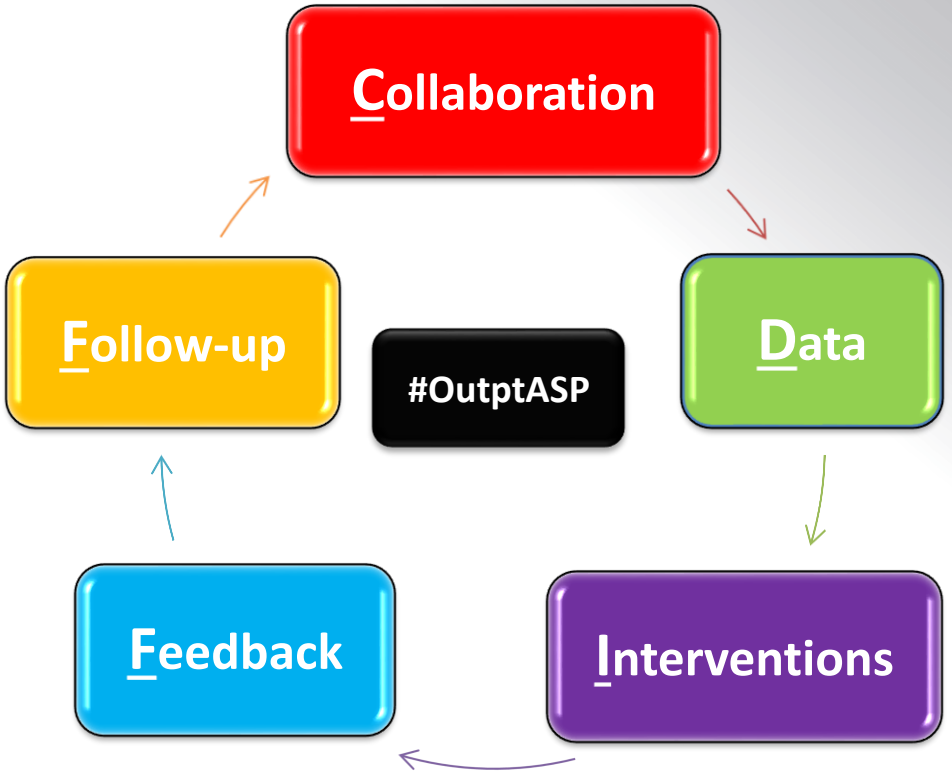
Let's Talk about C-DIFF



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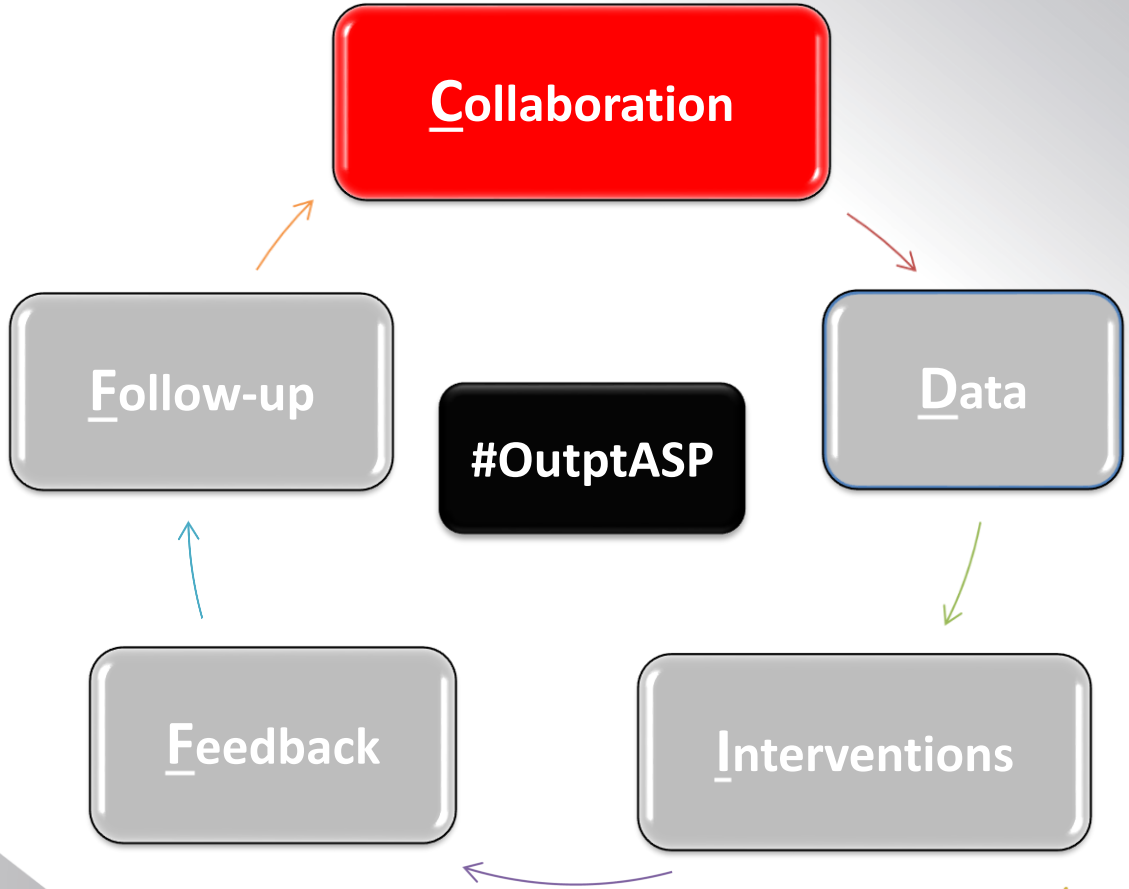

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Who is the most important stakeholder for a successful outpatient antimicrobial stewardship program?

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

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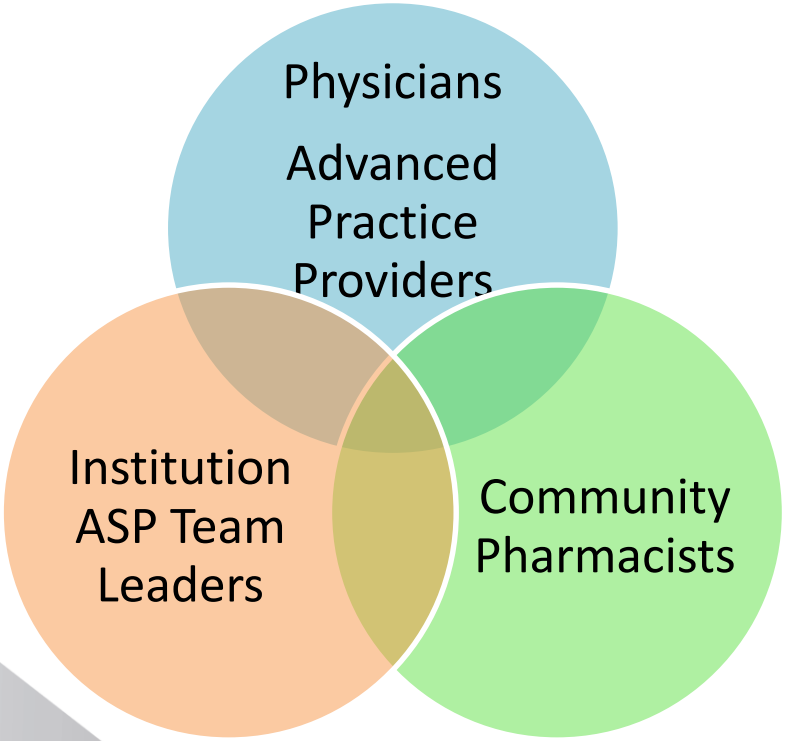
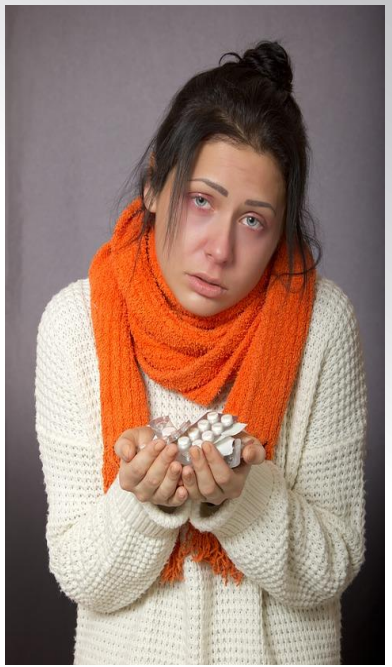
Who are the #OutptASP stakeholders?





The Patient!

Anyone prescribing or dispensing antibiotics in the ambulatory setting

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Who are the #OutptASP stakeholders?

The Patient!

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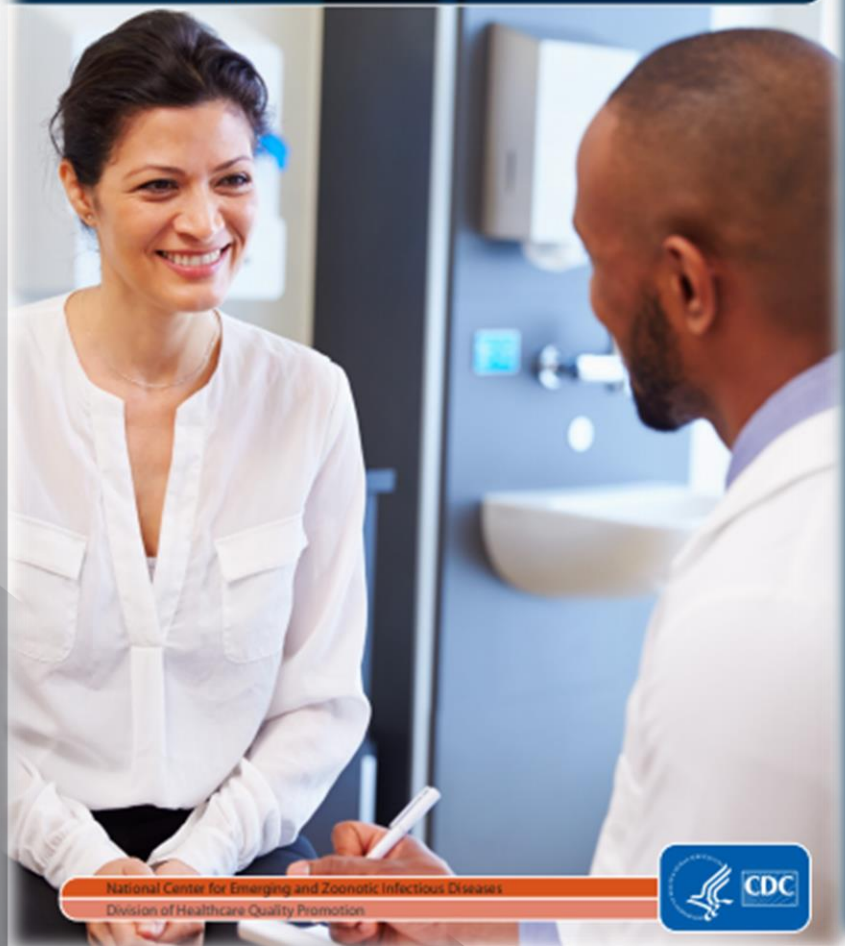
The Core Elements of Outpatient Antibiotic Stewardship

Appendix



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

Sanchez, G.V., Fleming-Dutra, K.E., Roberts, R.M., Hicks, L.A. Core Elements of Outpatient Antibiotic Stewardship. MMWR Recomm Rep 2016;65(No. RR-6):1–12.

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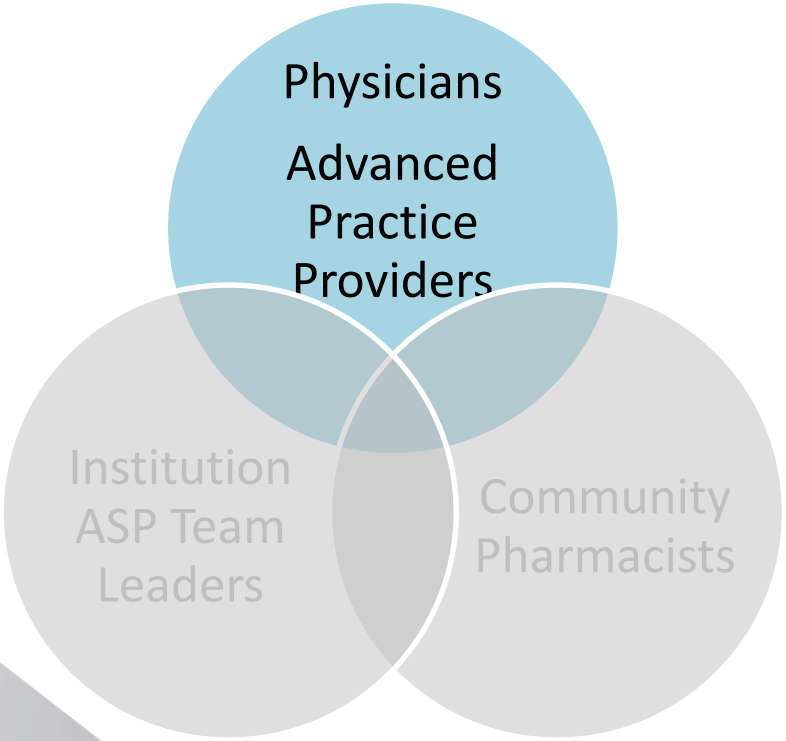
Who are the #OutptASP stakeholders?



The Patient!

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Know your prescribers

Understand their challenges and resources for #OutptASP

- Pressure to prescribe
- Clinician knowledge gaps
- Inadequate visit time
- Concern about patient satisfaction scores

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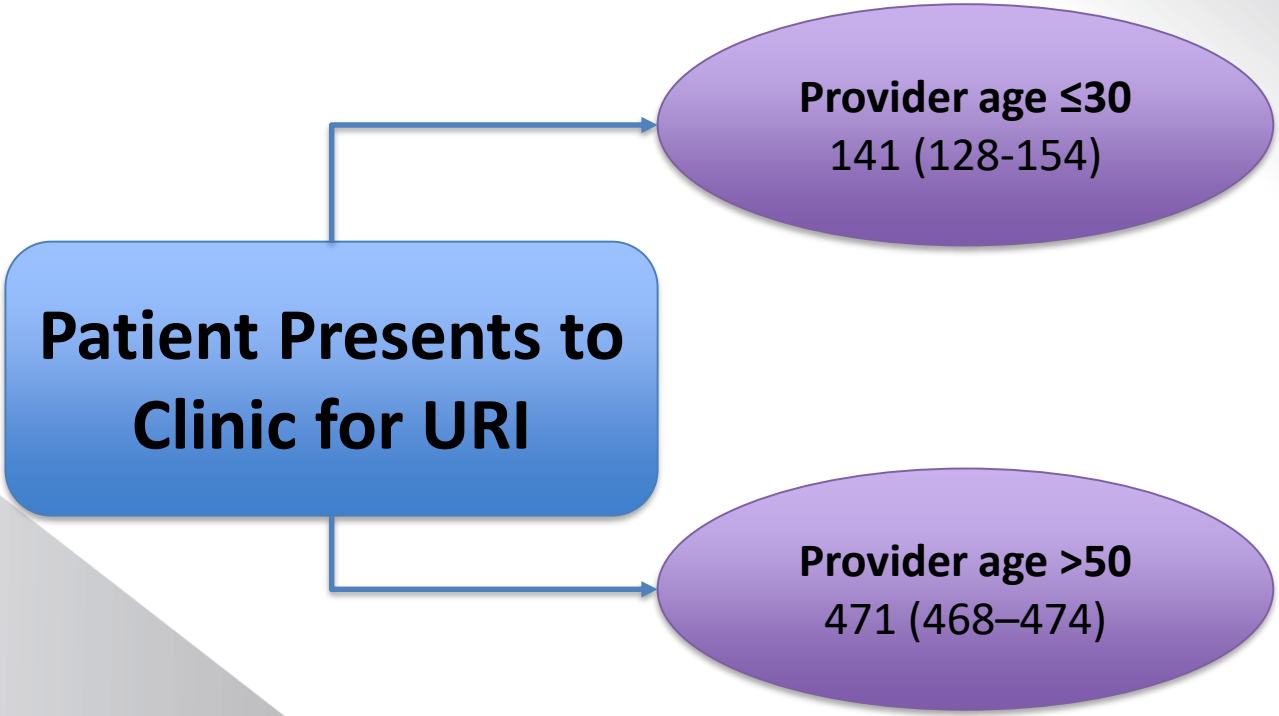
Mean Antimicrobial Prescriptions per 1,000 Visits (95% CI) by Indication



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

Schmidt, M., Spencer, M., & Davidson, L. (2018). ICHE, 39(3), 307-315. doi:10.1017/ice.2017.263

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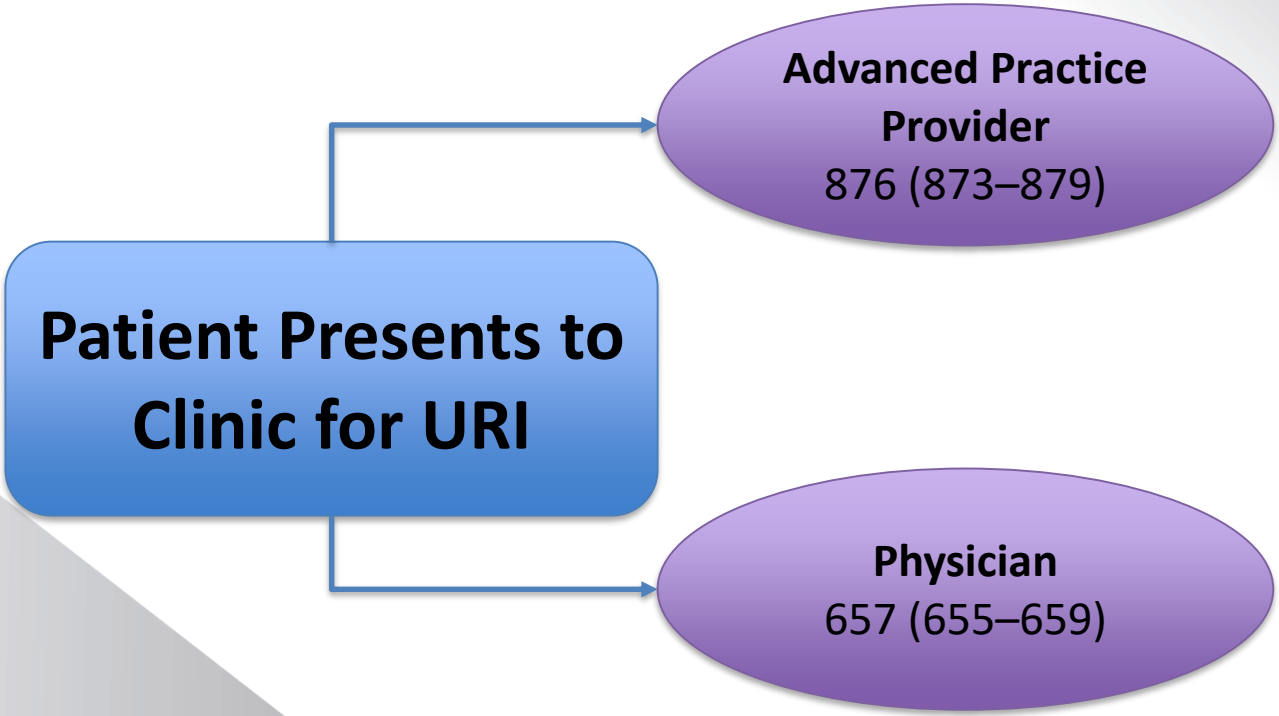

APPs prescribe **15% more** antibiotic prescriptions than MDs

IRR 1.15; 95% CI, 1.03–1.29, p= 0.014

Schmidt, M., Spencer, M., & Davidson, L. (2018). ICHE, 39(3), 307-315.
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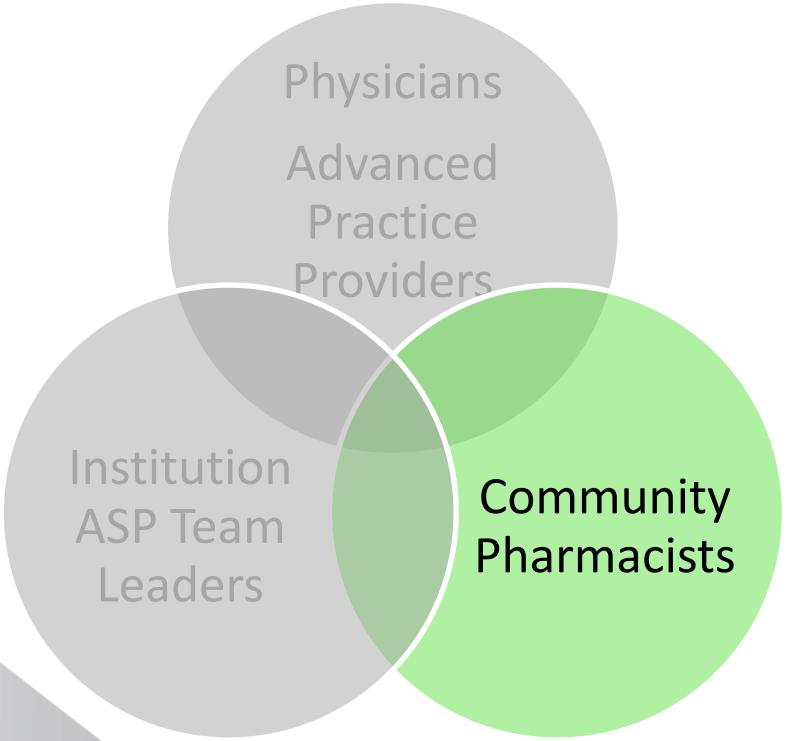

The Patient!

Anyone prescribing or dispensing antibiotics in the ambulatory setting

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Community Pharmacists can

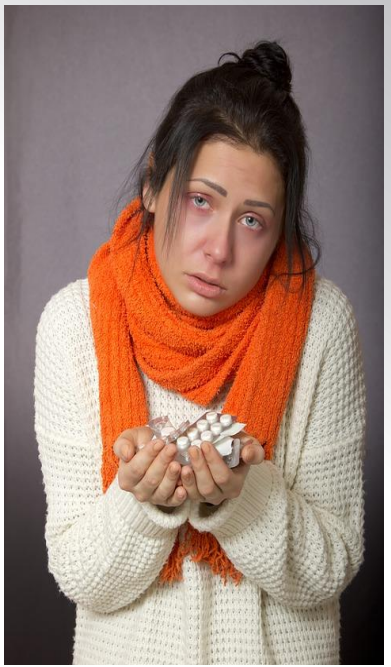
✓**Collaborate with physicians on clinical disease management algorithms**

(Int J Clin Pharm (2017) 39:165–172; Klesper et al. Health Security -Volume 13, Number 3, 2015)

✓**Provide just-in-time patient education**

(Am J Health-Syst Pharm—Vol 61 Jul 1, 2004)

Who are the #OutptASP stakeholders?



The Patient!

Anyone prescribing or dispensing antibiotics in the ambulatory setting

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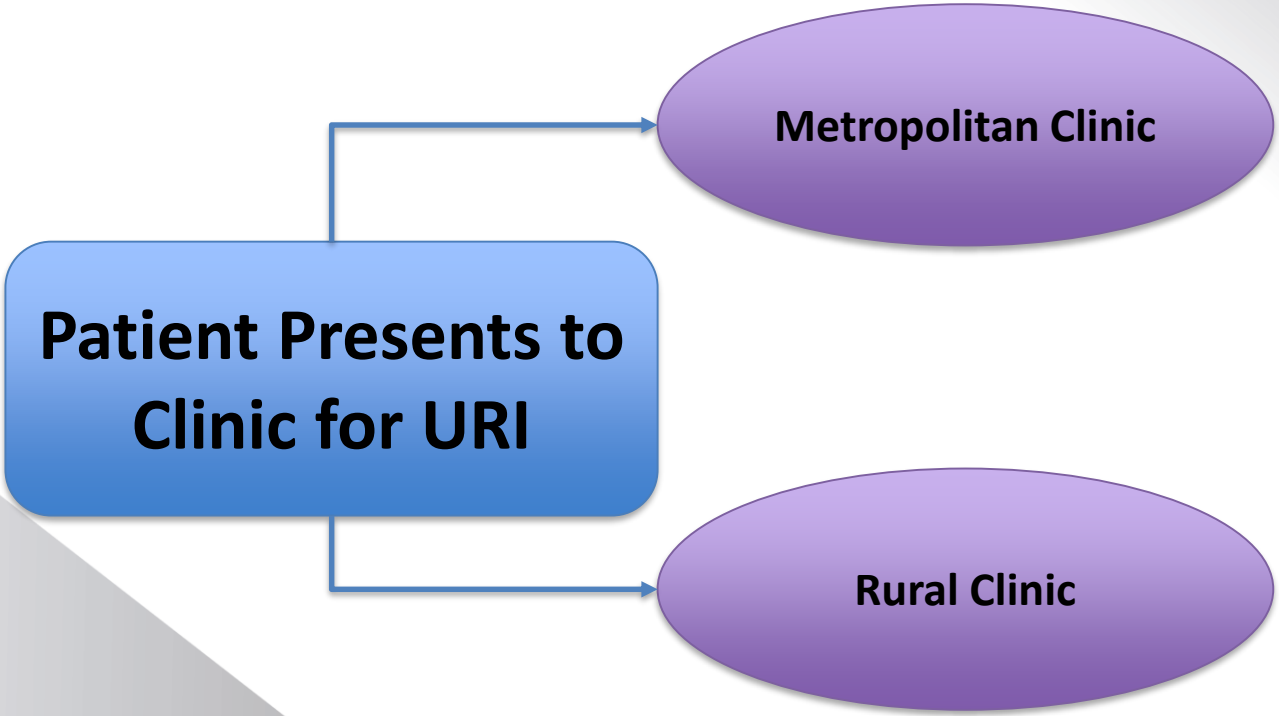
Mean Antimicrobial Prescriptions per 1,000 Visits (95% CI) by Indication



Urban patients prescribed **36% more** antibiotics than rural patients

IRR, 1.36; 95% CI, 1.15–1.61 p<0.001

Schmidt, M., Spencer, M., & Davidson, L. (2018). ICHE, 39(3), 307-315.
doi:10.1017/ice.2017.263

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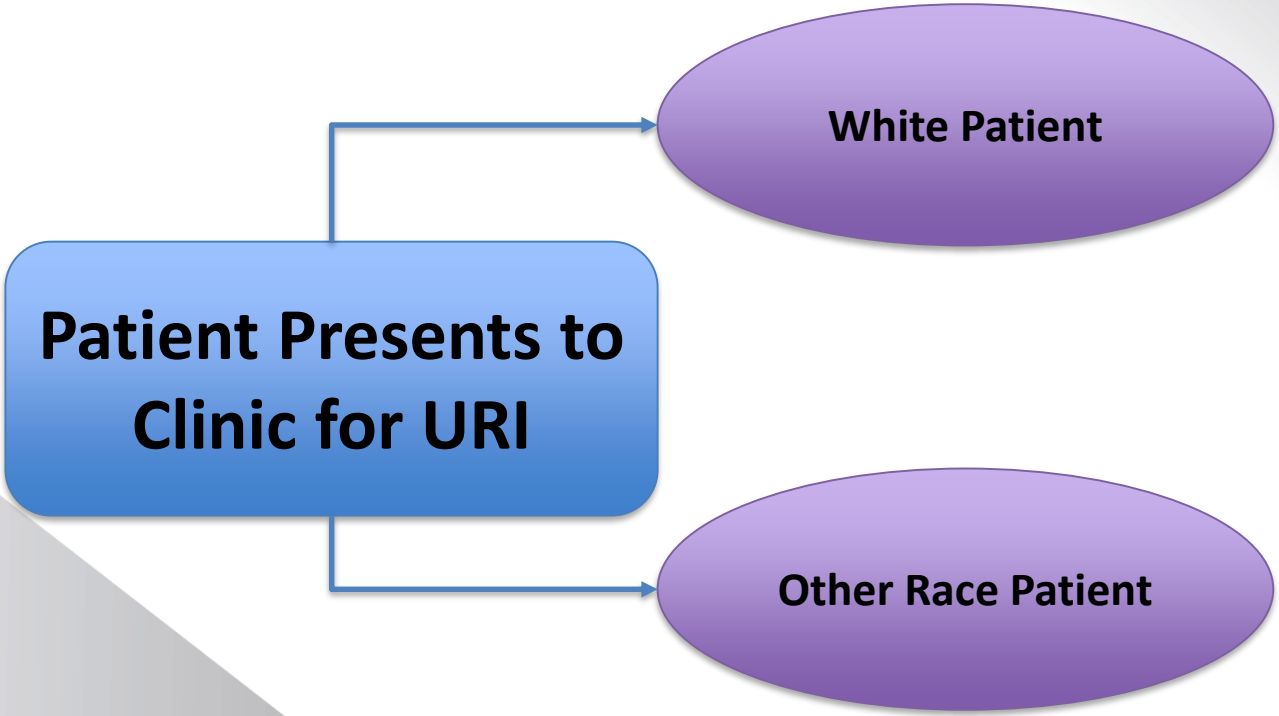
Mean Antimicrobial Prescriptions per 1,000 Visits (95% CI) by Indication



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

Schmidt, M., Spencer, M., & Davidson, L. (2018). ICHE, 39(3), 307-315. doi:10.1017/ice.2017.263

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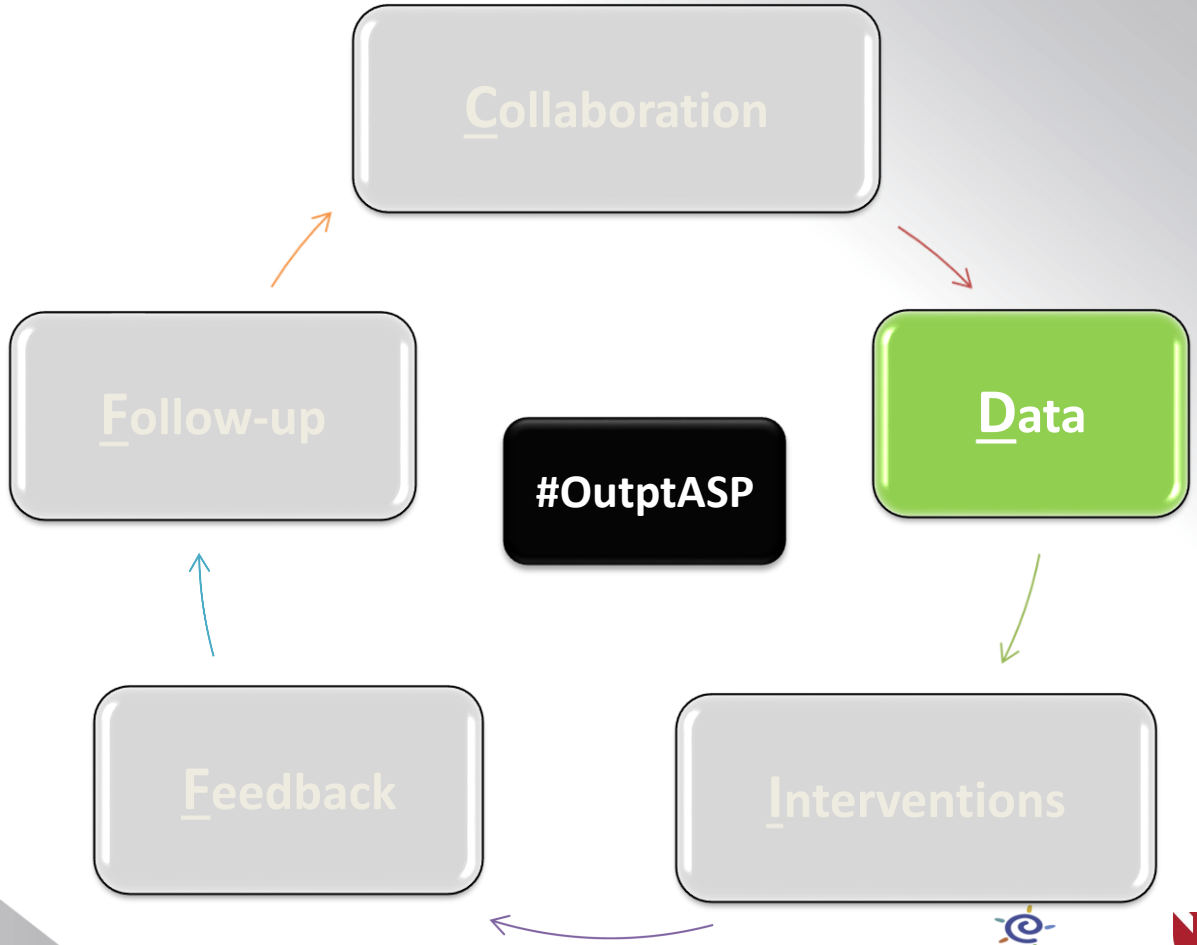

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Which metric is the most useful for measuring success of an outpatient antimicrobial stewardship program?

a. Indication-specific antimicrobial use

b. Drug-specific antimicrobial use

c. Microbe-specific antimicrobial use

d. Prescriber-specific antimicrobial use

e. Other

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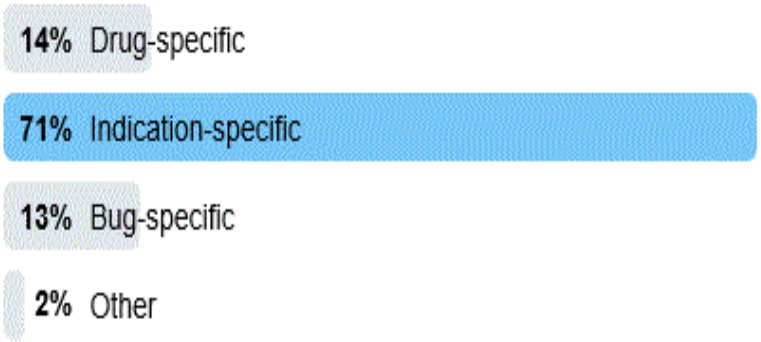
Following

Q3: What are the best metrics for outpatient antibiotic stewardship? How do we measure success? #OutptASP



118 votes • Final results

7:21 PM - 6 Mar 2018

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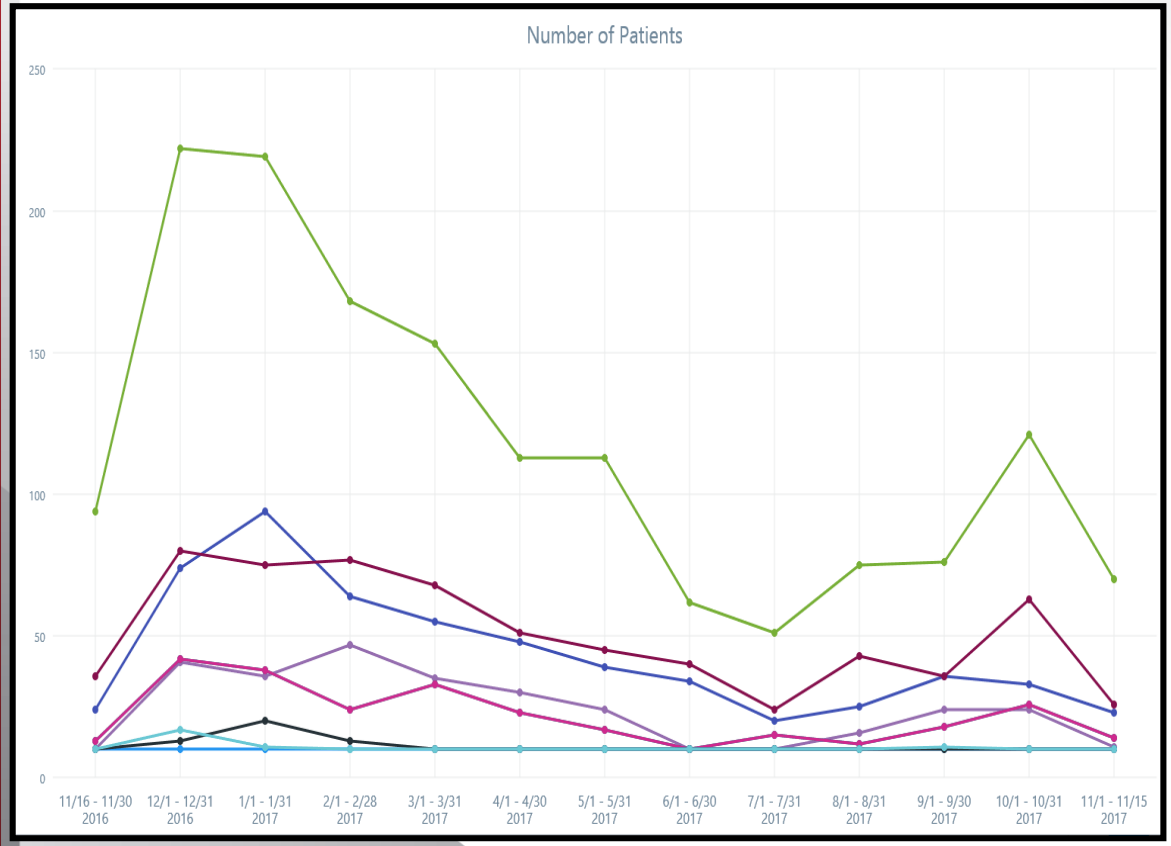
Nebraska Medicine: Antibiotic Prescriptions for Acute Bronchitis – By Drug Class



Legend

- Macrolides
- Fluoroquinolones
- Aminopenicillins (amoxicillin, Augmentin)
- Cephalosporin 1st generation
- Cephalosporin 2nd generation
- Cephalosporin 3rd generation
- Bactrim
- Tetracyclines

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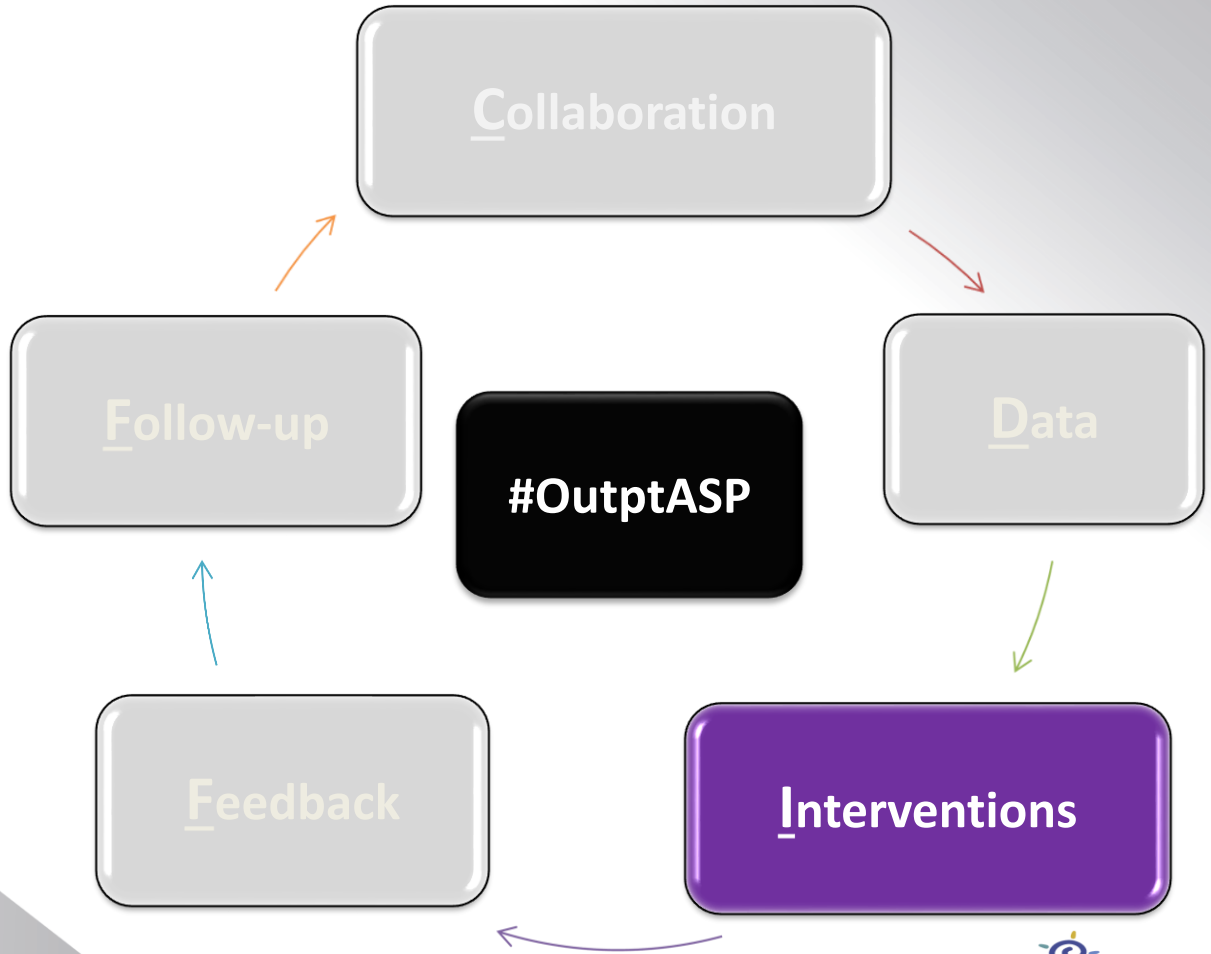
Metrics depend on resources

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



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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

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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

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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

Meeker D, Knight TK, Friedberg MW, et al. Nudging guideline-concordant antibiotic prescribing: a randomized clinical trial. JAMA Intern Med 201; 174: 425-31.

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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

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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.

Mangione-Smith R, McGlynn EA, Elliott MN, et al. Parent expectations for antibiotics, physician-parent communication, and satisfaction. Arch Pediatr Adolesc Med 2001; 155: 800-806.

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Patient Satisfaction

- Cross-sectional study conducted on >1,000 pediatric ARTI visits
- Positive Rx recommendations +/- negative Rx recommendations a**ssociated with ↓ antibiotic prescribing**

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

Mangione-Smith R, Zhou C, Robinson JD, et al. Communication practices and antibiotic use for acute respiratory tract infections in children. Ann Fam Med 2015; 13: 221-227.

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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**

American Academy of Pediatrics
DEDICATED TO THE HEALTH OF ALL CHILDREN™

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Standards for Antibiotic Prescribing

Facility Specific
Clinical Practice Guidelines & Pathways

Nebraska Medicine

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

Nebraska Medicine
SERIOUS MEDICINE. EXTRAORDINARY CARE.

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 nitrites 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

Type of Infection	Suspected Organisms	Recommended Treatment
Non-purulent cellulitis (no purulent material or wound present)	Most commonly beta-hemolytic Streptococcus [*Strep pyogenes* (group A strep), *Strep agalactiae* (group B strep or GBS)], *Strep dysgalactiae* (group C strep), Group G strep, Rarely *Staphyloccus aureus* (normally MSSA)	**Mild** • Cephalexin 500mg PO q6h OR • Dicloxacillin 500mg PO q6h *Severe Penicillin Allergy*: Clindamycin 300 mg PO q8h **Moderate-severe** • Cefazolin 2g IV q8h OR • Oxacillin 2g IV q6h *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 Amoxicillin 875mg PO BID • IV: Aqueous Penicillin G 2 MU q4h OR Ampicillin 2g q4-6h
Folliculitis	Typically *S. aureus* *P. aeruginosa* (hot tub)	- Warm compress - Topical antibiotics: Polymixin/bacitracin ointment - No systemic antibiotics needed
Impetigo (honey-crusted lesions)	*S. aureus*, including CA-MRSA, *S. pyogenes*	• 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

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Standards for Antibiotic Prescribing

Facility Specific
Clinical Practice Guidelines & Pathways

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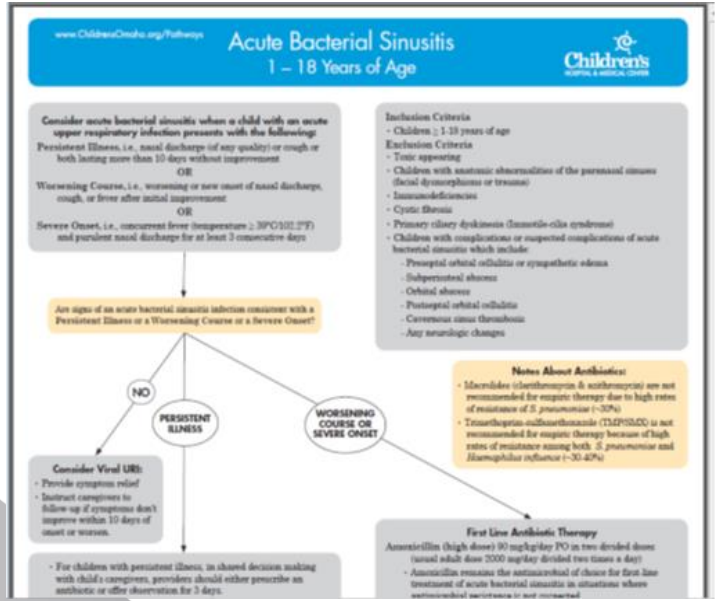

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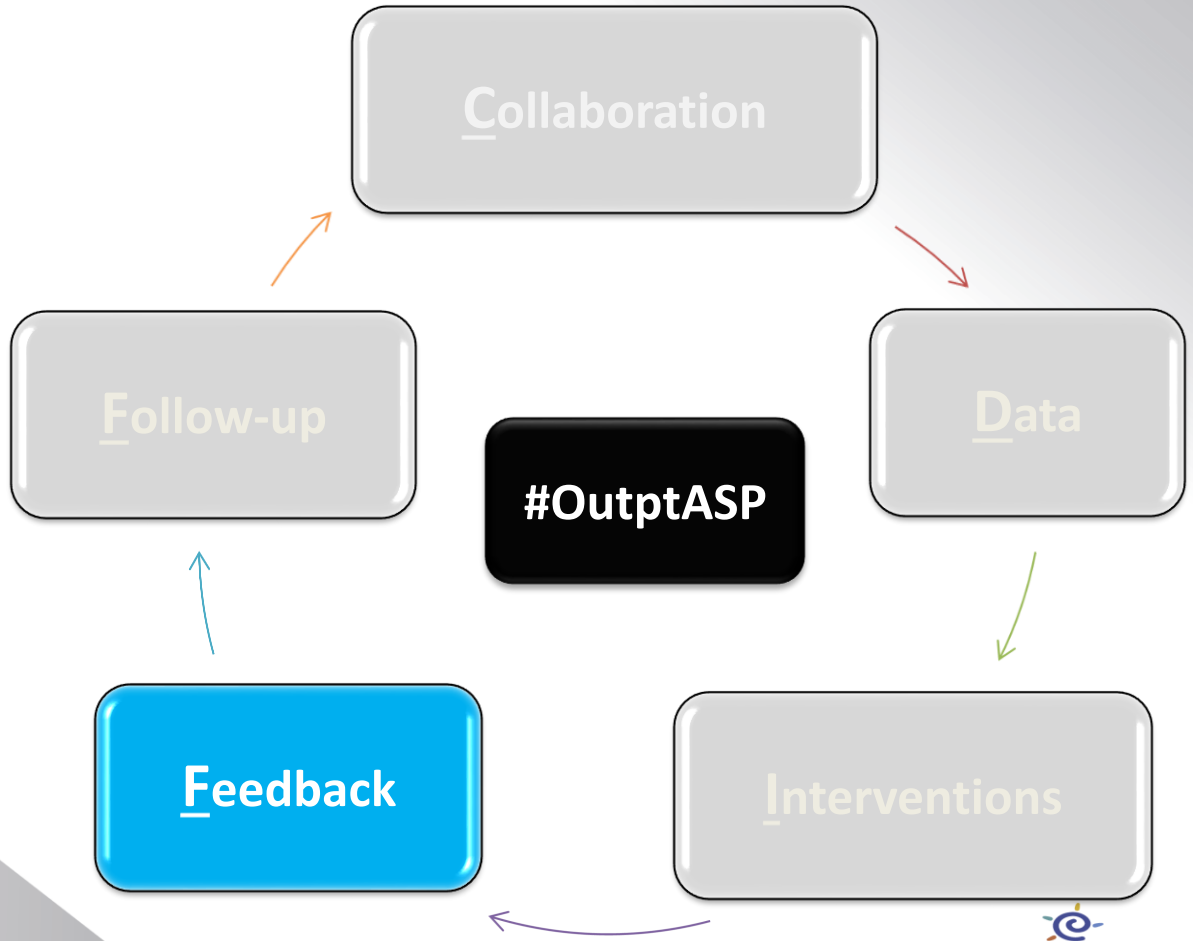
Standards for Antibiotic Prescribing

Facility Specific
Clinical Practice Guidelines & Pathways

- **Children's Hospital Colorado**
  - www.childrenscolorado.org/health-professionals/clinical-resources/clinical-pathways/

- **Seattle Children's**
  - www.seattlechildrens.org/healthcare-professionals/gateway/pathways/



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True or False?

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

a. True

b. False

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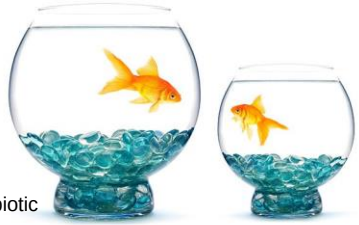
Feedback

- Randomized clinical trial conducted among 1^0 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



Meeker D, Linder JA, Fox CR, et al. Effect of behavioral interventions on inappropriate antibiotic prescribing among primary care practices. JAMA 2016; 315: 562-570.

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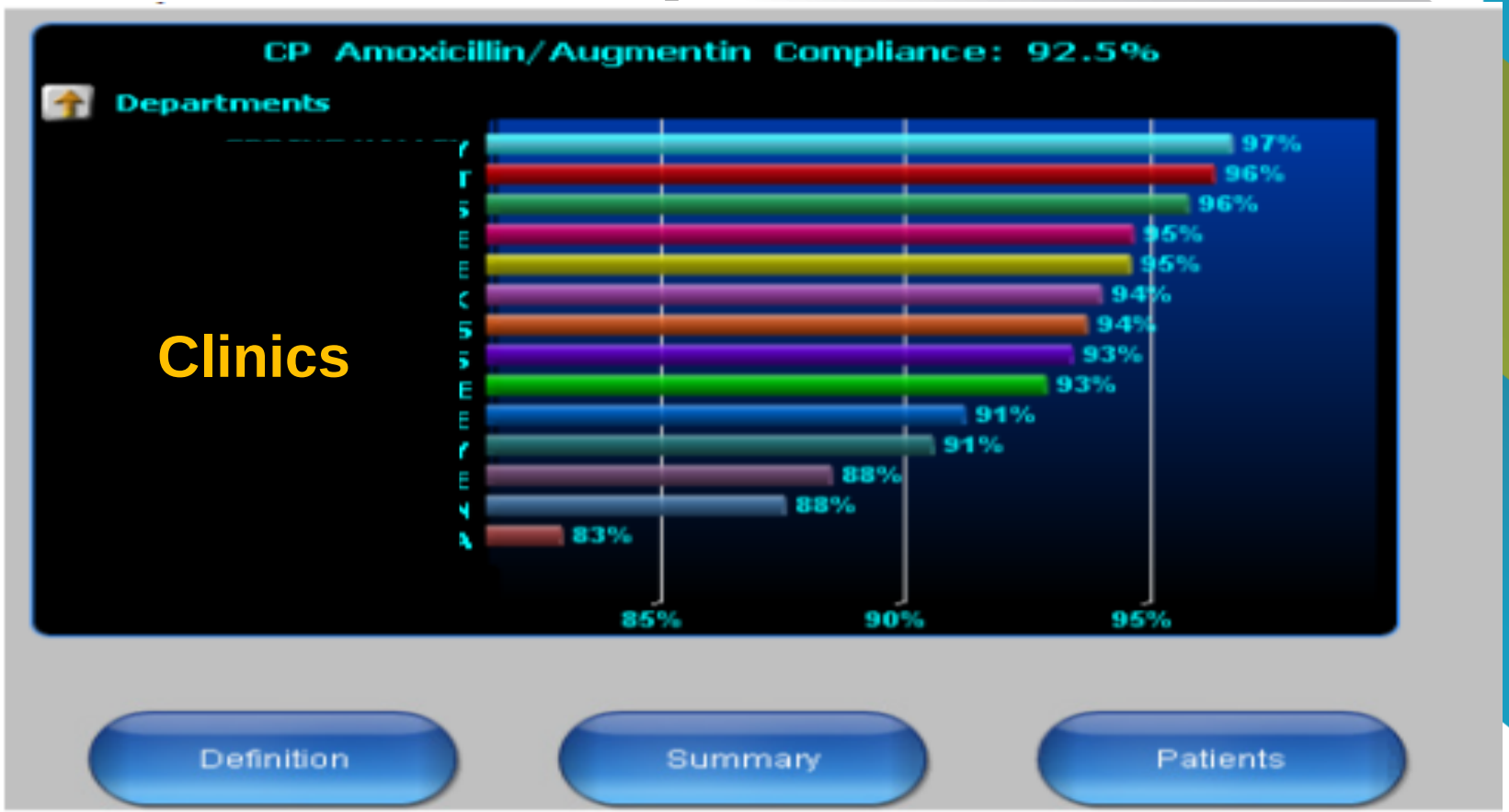
Peer Comparison



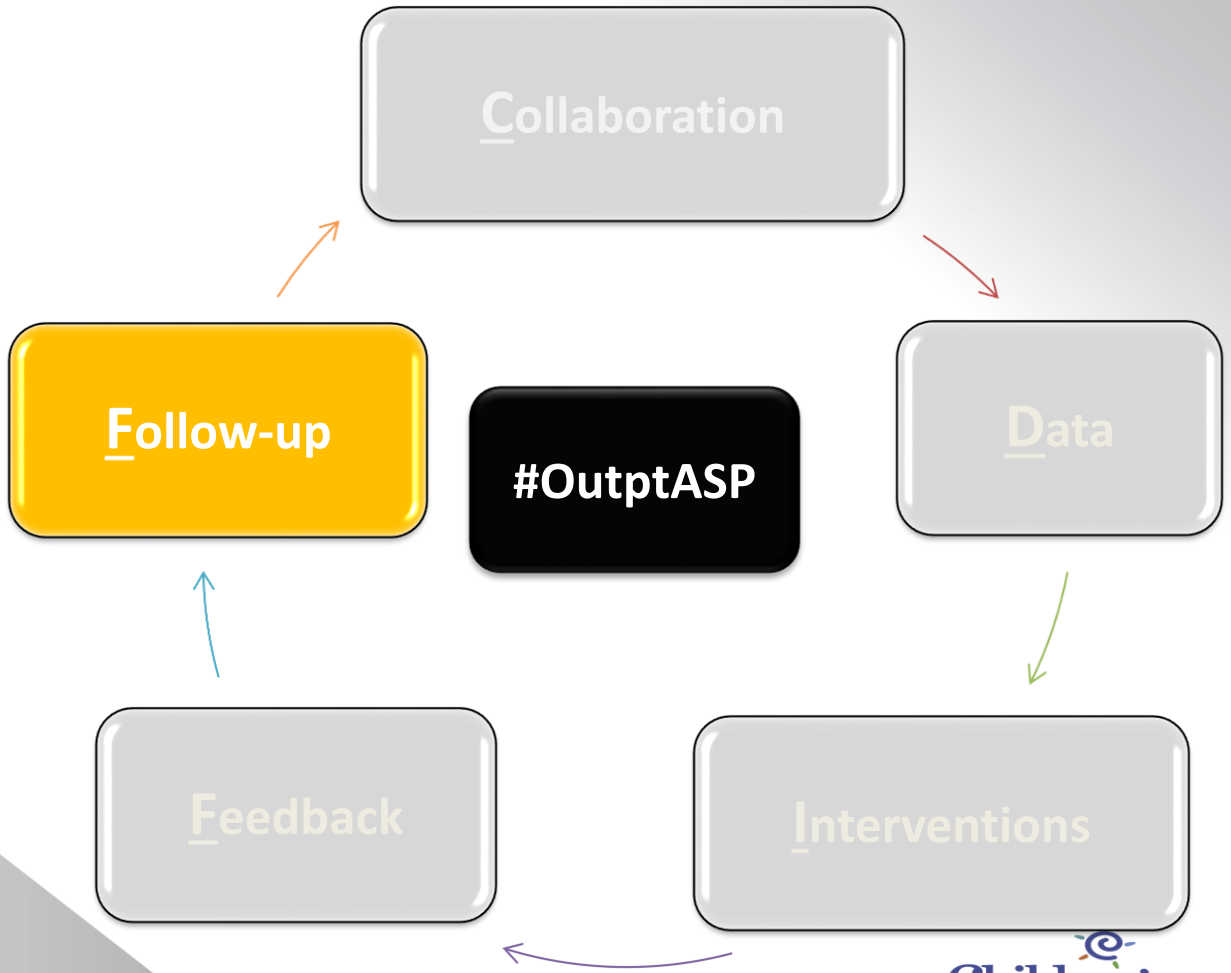


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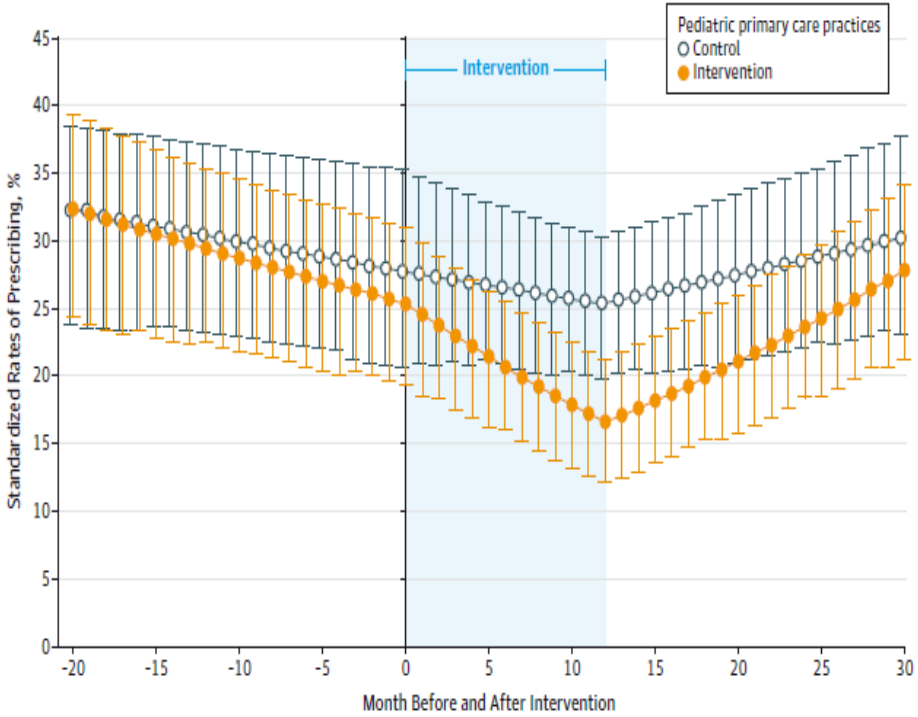
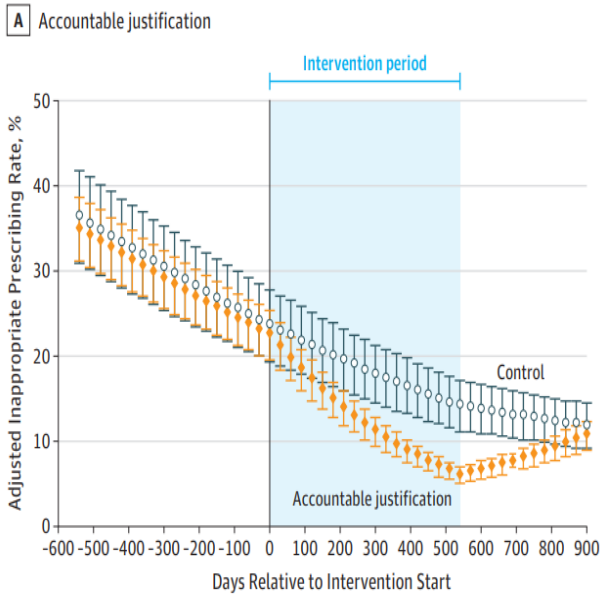
Figure. Standardized Rates of Broad-Spectrum Antibiotic Prescribing Before, During, and After Audit and Feedback

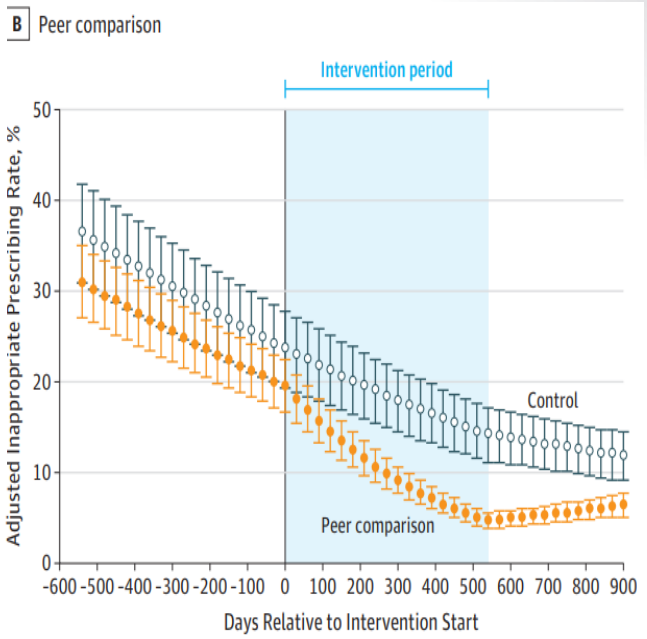


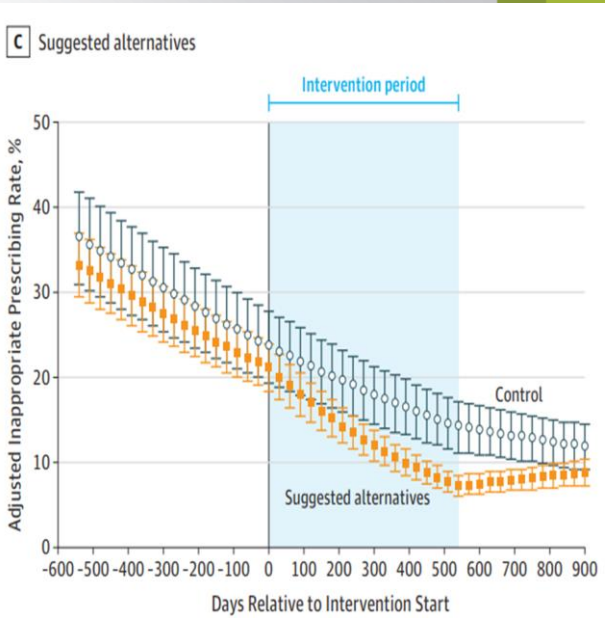
The estimate of interest is the treatment × time interaction term, representing the relative changes in trajectories before and during the intervention. Error bars indicate 95% CIs.

Gerber JS, Prasad PA, Fiks AG, et al. *JAMA.* 2014;312(23):2569–2570. doi:10.1001/jama.2014.14042

The JAMA Network







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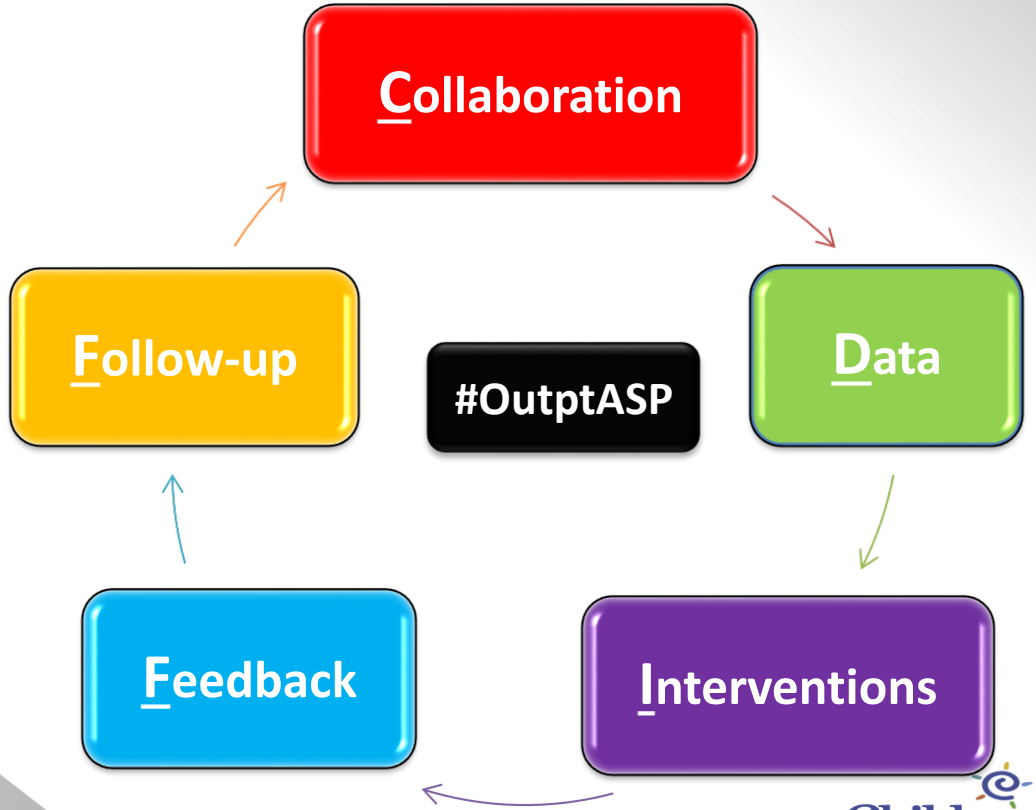
Linder JA, Meeker D, Fox CR, et al. *JAMA.* 2017;318(14):1391–1392. doi:10.1001/jama.2017.11152

A Successful #OutptASP requires



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#NebStewardSummit2018

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