


Doing What's Best for Our Patients

Antibiotic Stewardship in the ED Setting

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Outline

- Problem of antibiotic overuse
 - Antimicrobial stewardship: why the ED?
 - Understanding barriers to improving care
 - Potential interventions to improving appropriate use of antibiotics
- 

Antibiotic stewardship is patient safety

- Adverse drug events
- *Clostridium Difficile*
- Long-term consequences


Estimated minimum number of illnesses and deaths caused annually by antibiotic resistance*:

At least  **2,049,442** illnesses,
 **23,000** deaths

**bacteria and fungus included in this report*




Antimicrobial Stewardship Goals

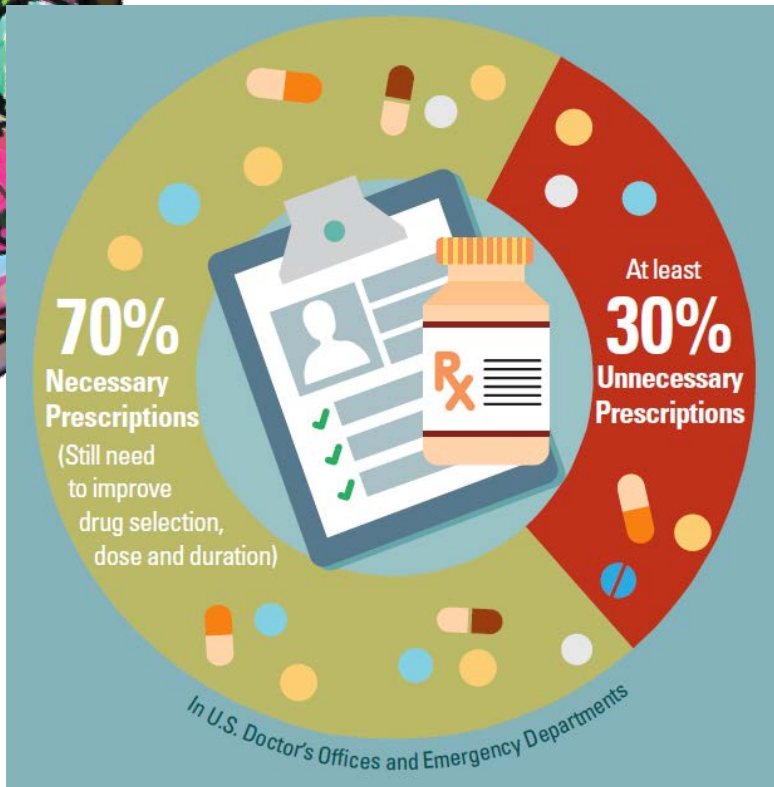
- Optimize antibiotic practices
 - Improve healthcare outcomes
 - Reduce cost
 - Reduce resistance
- 



Where Do We Want to Be?

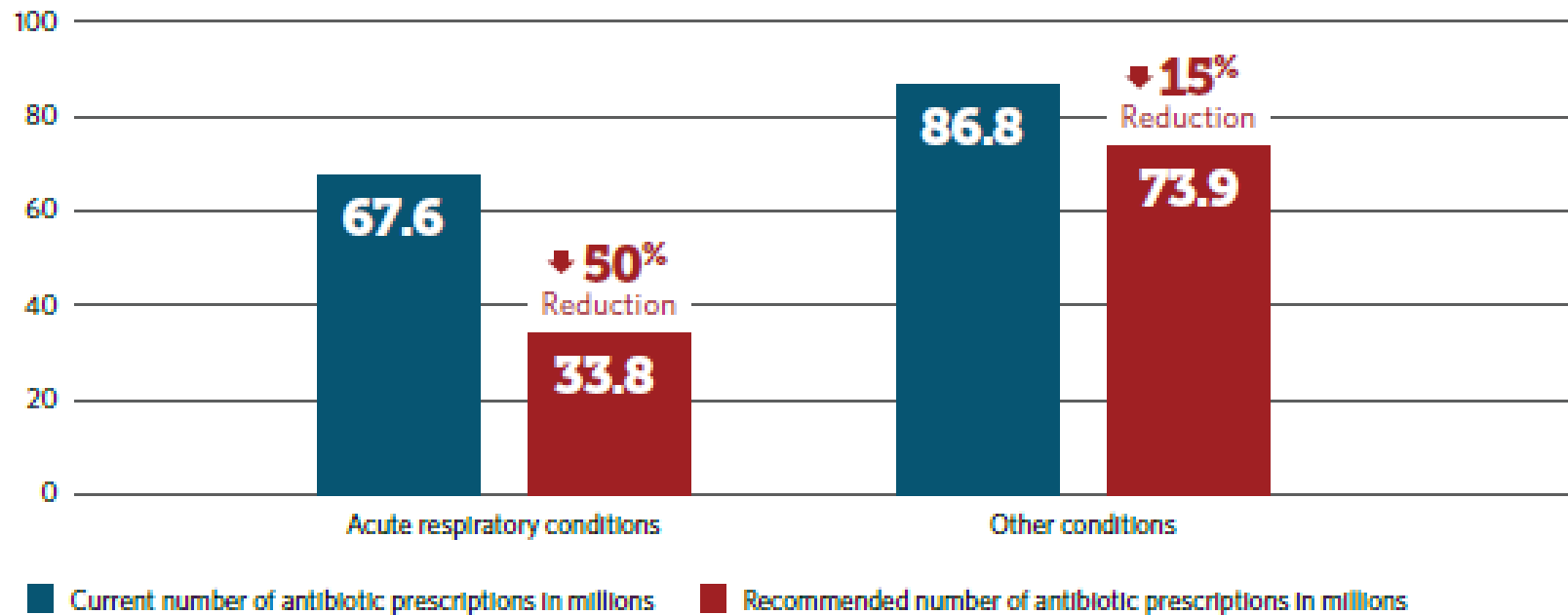
- Every patient gets optimal antibiotic treatment
 - Antibiotics only when they are needed
 - If needed
 - Right antibiotic
 - Right dose
 - Right duration
 - **Antibiotic stewardship** is the effort to measure and optimize antibiotic use
- 

Setting National Targets: Outpatient Antibiotic Prescribing



47 million unnecessary antibiotic prescriptions per year

Outpatient Antibiotic Prescribing Reduction Targets




Source: Analysis of NAMCS and NHAMCS data on U.S. antibiotic prescribing, 2010-2011

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ED as a target site for stewardship

- Each year 10 million antibiotic prescriptions are written from the emergency department
 - Unnecessary antibiotics are frequently prescribed for known viral infections
 - Inappropriate antibiotics are frequent
 - >66% for UTI
- 




Stewardship: Opportunities in the ED

- Nexus of community and hospital
 - “Safety Net”
 - 15% of ED/urgent care visits result in antibiotic prescription
 - Diverse conditions along spectrum of severity
 - Paucity of recommendations outside hospital setting
- 




Targets for stewardship

- Appropriate antibiotics
 - Pneumonia, UTI, miscellaneous bacterial infections
 - No antibiotics
 - Bronchitis, bronchiolitis, viral URI, influenza, non-suppurative otitis media, viral pneumonia, asthma, allergy
 - Test for bacterial infection
 - Pharyngitis (all-cause)
 - Reduction in antibiotics to level of the lowest prescribing region
 - Sinusitis, suppurative otitis media
 - All other remaining conditions
- 




Antimicrobial Stewardship: Why the ED?

- Antibiotics second most commonly prescribed Rx
 - Overuse of antibiotics for common ID problems (URI)
 - Overuse of broad spectrum antibiotics (SSTI, UTI)
 - Guideline adherence
 - Unique site and setting challenges necessitate tailored solution/local champion
- 




Challenges for the ED

- ED crowding/boarding
 - Patient turnover
 - Quick decision-making
 - Shift based scheduling
 - Diagnostic uncertainty
 - Concern for poor outcomes
 - Lack of patient follow-up
 - Patient satisfaction
- 




Facilitators

- Team based approach
 - Nexus of community and hospital
 - Willingness to take on new tasks and learn
 - Patient education/communication tools
 - Innovate/create
 - Local guidelines/pathways
 - CDSS
 - Rapid diagnostics
 - Antibiograms
- 




Why might providers prescribe antibiotics inappropriately?

- Lack of knowledge of appropriate indications?
 - Fear of complications?
 - Patient pressure and satisfaction?
 - Habit?
- 



May et al. Multisite Exploration of Clinical Decision Making for Antibiotic Use by Emergency Medicine Providers Using Quantitative and Qualitative Methods

- 1. Survey of 150 ED providers on KAB
 - 2. IDI with 21 providers across 8 sites

 - **Themes:**
 - Resource/environmental factors
 - Access/quality of care received outside ED
 - Patient-provider relationship
 - Clinical inertia
 - Local knowledge generation
- 



Why might providers prescribe antibiotics inappropriately?

- ~~Lack of knowledge of appropriate indications~~
 - Providers generally know the guidelines
 - *Just-in-time evidence delivery*
- Fear of complications
 - Providers cite fear of infectious complications

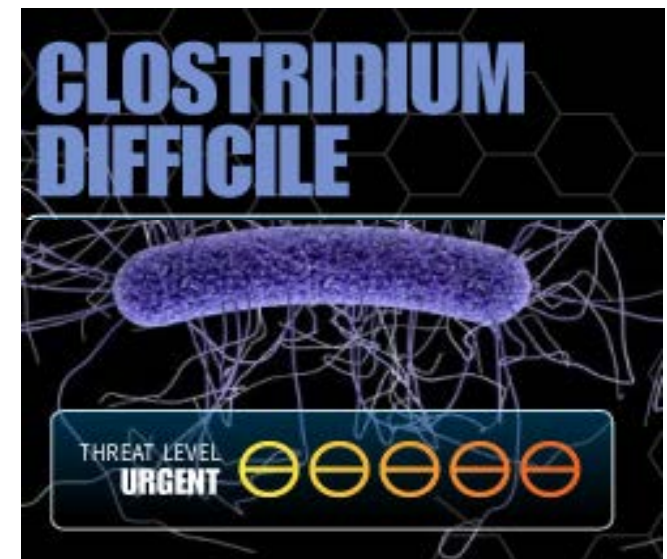
What if something bad happens?

- **Without an antibiotic**

- NNT=4000 URIs treated to prevent 1 case of pneumonia

- **With an antibiotic**

- NNH 4-20
- 1:1000 antibiotics lead to ED visit for adverse events
- *Clostridium difficile* infection





Why might providers prescribe antibiotics inappropriately?

- ~~Lack of knowledge of appropriate indications~~
 - Providers generally know the guidelines
 - *Just-in-time evidence delivery*
- ~~Fear of complications~~
 - Providers cite fear of infectious complications
 - *Understanding adverse events (NNH)*
- Patient pressure and satisfaction
 - Providers universally cite patient requests for antibiotics
 - Providers worry about losing patients to other providers



Physician perception of patient expectations

- Overt requests for antibiotics are rare
- When physicians think patients/parents want antibiotics, they are more likely to prescribe
 - 62% when they thought parent wanted antibiotics
 - 7% when they thought parent did **not** want antibiotics
- ED physicians terrible at prediction
 - 25-33% correctly identified patient's expectations
 - Why are we so bad at predicting?



Why do we think patients want antibiotics?

- Physicians thought parents wanted antibiotics when
 - Parents suggested a candidate diagnosis
 - Parents question non-antibiotic treatment plan
- Parents who questioned the treatment plan were equally likely to expect or not expect antibiotics
- Two different conversations
 - One that the physician understands
 - One that the patient is having

Stivers. *Journal Family Practice* 2003; 52(2):140-8.

Mangione-Smith. *Arch Pediatr Adolesc Med* 2006;160(9): 945-952.





Improve Patient satisfaction

- Parents are still satisfied if they don't get antibiotics
- Parents are dissatisfied if communication expectations are not met
- What do parents want?
 - Explanation
 - Positive recommendations
 - Contingency plan

Mangione-Smith *Pediatrics* 1999;103(4):711-8.

Mangione-Smith *Arch Pediatr Adolesc Med* 2001;155:800-6.

Mangione-Smith *Ann Family Med* 2015; 13(3) 221-7.





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 - *Understanding adverse events (NNH)*
- ~~Patient pressure and satisfaction~~
 - Providers universally cite patient requests for antibiotics
 - *Effective communication skills, managing expectations*
- Habit




Provider variability: Habit of prescribing antibiotics

- 1 million VA outpatient visits for acute respiratory infections (most do not require antibiotics)
 - **Top 10% of providers Rx antibiotics in $\geq 95\%$ visits**
 - Lowest 10% prescribed antibiotics in $\leq 40\%$ of ARI visits
- In a pediatric network of 25 practices,
 - 18 to 36% of acute visits resulted in antibiotic
 - 15 to 57% of antibiotics were broad-spectrum by practice




Approaches to stewardship in the ED

- Engage ED clinicians in existing ASP
 - Multidisciplinary collaboration
 - Education
 - Guidelines and Clinical Pathways
 - Audit and Feedback
 - Clinical decision support
 - Rapid Diagnostics
 - Focus on outpatients/care transitions
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Clinician Education

- Active programs
 - Tailored educational messaging
 - Multidisciplinary grand rounds
 - Engagement of thought leaders from the specialty/setting
 - Unlikely to lead to enduring changes without ongoing oversight
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Clinician Education

- Percival et al, Am J Emerg Med, 2015
 - Pre-post study with educational intervention
 - 350 ED outpatients with uncomplicated UTI
 - Primary outcome: guideline adherent empiric tx
 - Appropriate empiric antibiotic tx increased from 44.8% to 83% ($P < .001$).
 - Driven by increase in nitrofurantoin (cystitis) from 12% to 80% ($P < .001$).
 - No change in 30-day repeat ED visits for UTI
- 




Site-Specific Guidelines

- Clinical practice guidelines
 - Opportunity to tailor based on individual facility susceptibilities and formulary
 - Provider education and feedback
 - Clinical pathways
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Site Pharmacist

- Recent literature suggests ED pharmacist can be key component of clinical care team
 - Facilitate appropriate prescribing
 - Define outcome measures for ED
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Clinical Decision Support

- Health information technology
- Handheld systems found to reduce antibiotic use and LOS in ICU
- CDSS reduces unnecessary antibiotic use in outpatient setting
- Widespread implementation slow
- Ideal: incorporate patient data at point of electronic prescribing
- Limit information overload




Electronic Order Sets

- **Hecker et al, PLoS One 2014**
 - Electronic UTI order set then 2 months of feedback
 - Women 18-65 with UTI diagnosis
 - Outcomes: guideline adherence, antibiotic use, diagnostic accuracy
 - Adherence increased from 44% to 68% (period 1) to 82% (period 2) ($P \leq .015$).
 - Rx of FQ for uncomplicated cystitis decreased from 44% to 14% (period 1) to 13% (period 2) ($P < .001$ and 0.7).
- 




Electronic Order Sets

- Hecker et al, PLoS One 2014
 - Unnecessary antibiotic days for the 200 patients in each period decreased from 250 days to 119 days to 52 days ($P < .001$ for each successive period)
 - For 40% to 42% of cases diagnosed as UTI, diagnosis was deemed unlikely
 - no difference between baseline and intervention periods
- 




Post-prescription Review

- Inpatient strategy
 - Telephone follow-up
 - Care coordination
 - “Wait and see” approach
 - Shorten duration of therapy
 - Streamlining
 - Need additional funds for non-inpatient settings
- 




How can we change clinician antibiotic prescribing practices?

- Identify effective interventions to improve outpatient antibiotic prescribing
 - Adapt them to the local context
 - Use rigorous implementation science methods before and after
 - Disseminate for broader uptake (scale and spread)
- 



Evidence-Based Quality Improvement

- Educational methods — decisions based on knowledge
 - Guidelines
 - Clinical decision support
 - Behavioral methods — decisions influenced by psychosocial factors
 - Communications training
 - Public commitments
 - Mixed theoretical basis
 - Audit and feedback with comparisons to peers
 - Academic detailing (one-on-one education)
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MITIGATE ANTIMICROBIAL STEWARDSHIP TOOLKIT



<https://tinyurl.com/mitigatetoolkit>

How Do We Accomplish our Goals?

CORE ELEMENTS OF OUTPATIENT ANTIBIOTIC STEWARDSHIP



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 providers, or have providers assess their own antibiotic prescribing practices themselves.



EDUCATION AND EXPERTISE

Provide educational resources to providers and patients on antibiotic prescribing, and ensure access to needed expertise on optimizing antibiotic prescribing.



Primary care clinics
and clinicians



Outpatient specialty
and subspecialty
clinics and clinicians



Emergency departments
(EDs) and emergency
medicine clinicians



Retail health clinics
and clinicians



Urgent care clinics
and clinicians



Dental clinics and
dentists

Data Extraction for Clinician Feedback

Acute respiratory infections (ICD-10)

Abx not appropriate (e.g. acute bronchitis)

Abx sometimes appropriate (e.g. pharyngitis)

Antibiotics prescribed (RxNorm)

Modifying conditions (ICD-10)

Comorbid conditions (COPD, HIV/AIDS)

Other infections (UTI, pneumonia)



Social Norms: Underperformer

Dear Dr. X,

You were not a top performer in antibiotic stewardship for likely viral infections last week.

You wrote too many unnecessary prescriptions.

Based on your most recent activity, you wrote X prescriptions of Y acute respiratory infection cases that didn't warrant antibiotics.

Sincerely,

The MITIGATE antibiotic stewardship team





Social Norms: Top Performer

Dear Dr. X,

Congratulations! You were a top performer in antibiotic stewardship for likely viral infections last month.

You were in the top 10% of providers.

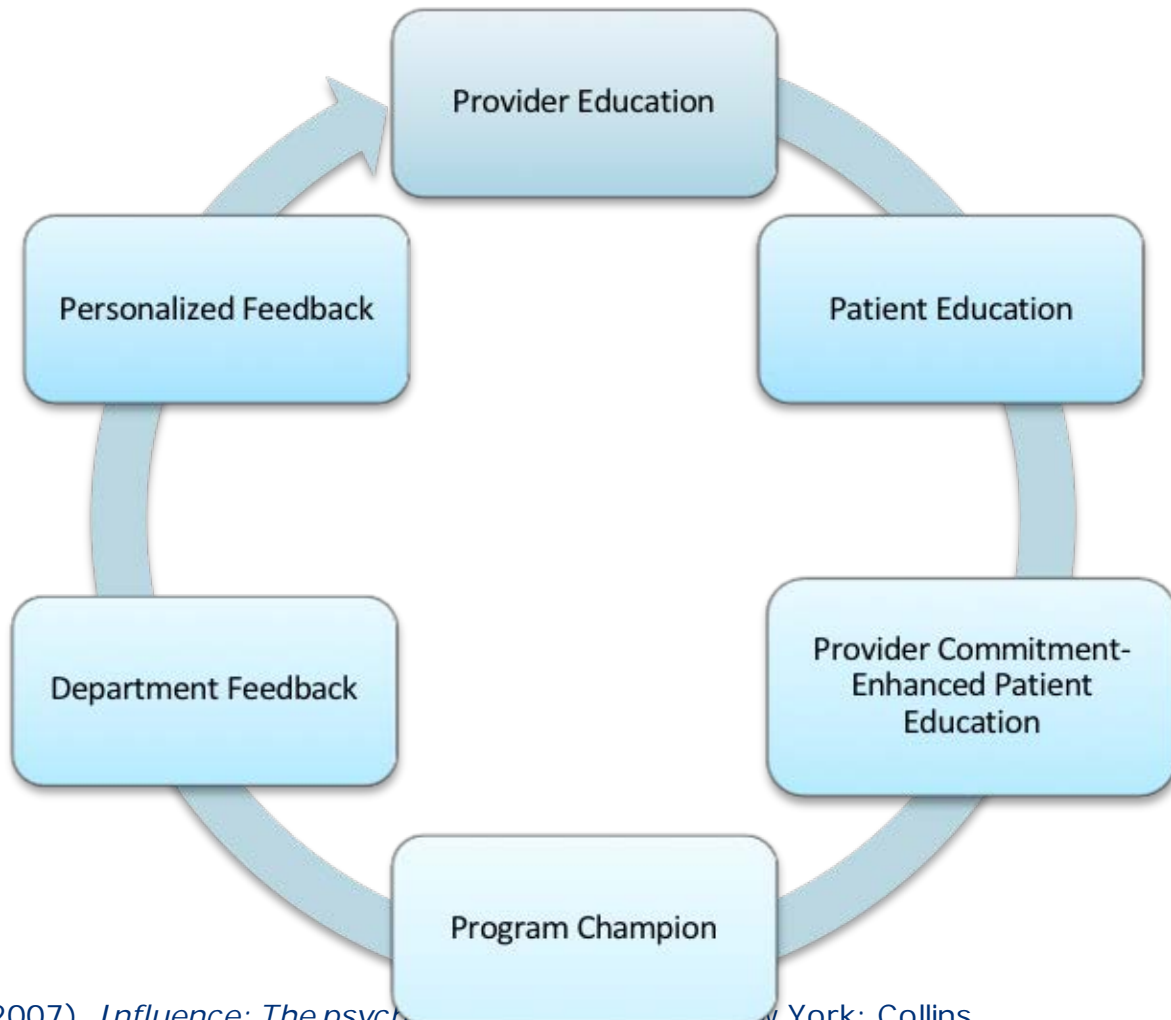
Based on your most recent activity, you wrote X prescriptions of Y acute respiratory infection cases that didn't warrant antibiotics.

Sincerely,

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Nudge: Identifiability



MITIGATE STUDY COMMITMENT LOG

By signing below you commit to the department to prescribe antibiotics only when they are needed, and will avoid giving antibiotics when they might do more harm than good.

Please refer to the CDC letter/poster for additional reading.

A Commitment to Our Patients about Antibiotics

*Antibiotics only fight infections caused by bacteria. Like all drugs, they can be harmful and should only be used when necessary. **Taking antibiotics when you have a virus can do more harm than good: you will still feel sick and the antibiotic could give you a skin rash, diarrhea, a yeast infection, or worse.***

*Your health is important to us. As your healthcare providers, we promise to provide the best possible treatment for your condition. If an antibiotic is not needed, we will explain this to you and will offer a treatment plan that will help. We are **dedicated** to prescribing antibiotics **only** when they are needed, and we will avoid giving you antibiotics when they might do more harm than good.*

If you have any questions, please feel free to ask us.

Sincerely,

Printed Name	Signature	Badge Reel	Pin	Commitment Poster Signature
John Doe	<i>John Doe</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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Public Commitment



“We need to talk about your flair”





LESSONS LEARNED

- Nudges
 - Formal commitment (consistency)
 - Local champion (identifiability)
 - Comparisons (social norms)
 - Clinician buy-in
 - Low hanging fruit
 - Operational support
 - Implementation science and QI = framework for evidence-based program implementation
- 