



Antimicrobial Resistance

Erica Reed, PharmD, BCIDP, FIDSA

*Lead Specialty Practice Pharmacist, Infectious Diseases/Antimicrobial Stewardship
The Ohio State University Wexner Medical Center*

MedNet21
Center for Continuing Medical Education

 **THE OHIO STATE UNIVERSITY**
WEXNER MEDICAL CENTER

Objectives

- Highlight the burden of antimicrobial resistance (AMR)
- Discuss factors contributing to the emergence of AMR
- Review common pathogens displaying AMR

Antimicrobial Resistance (AMR)

“If we do not act to address the problem of AR, we may lose quick and reliable treatment of infections that have been a manageable problem in the United States since the 1940s. Drug choices for the treatment of common infections will become increasingly limited and expensive - and, in some cases, nonexistent.”

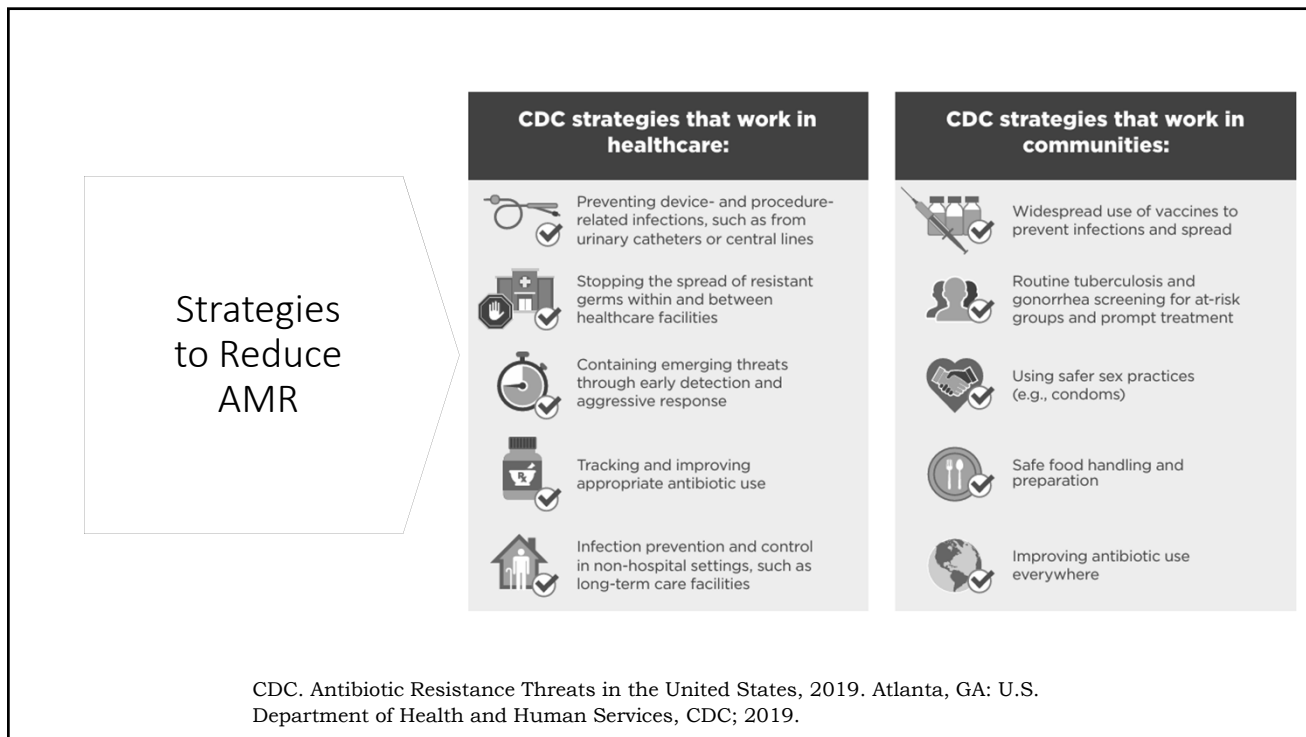
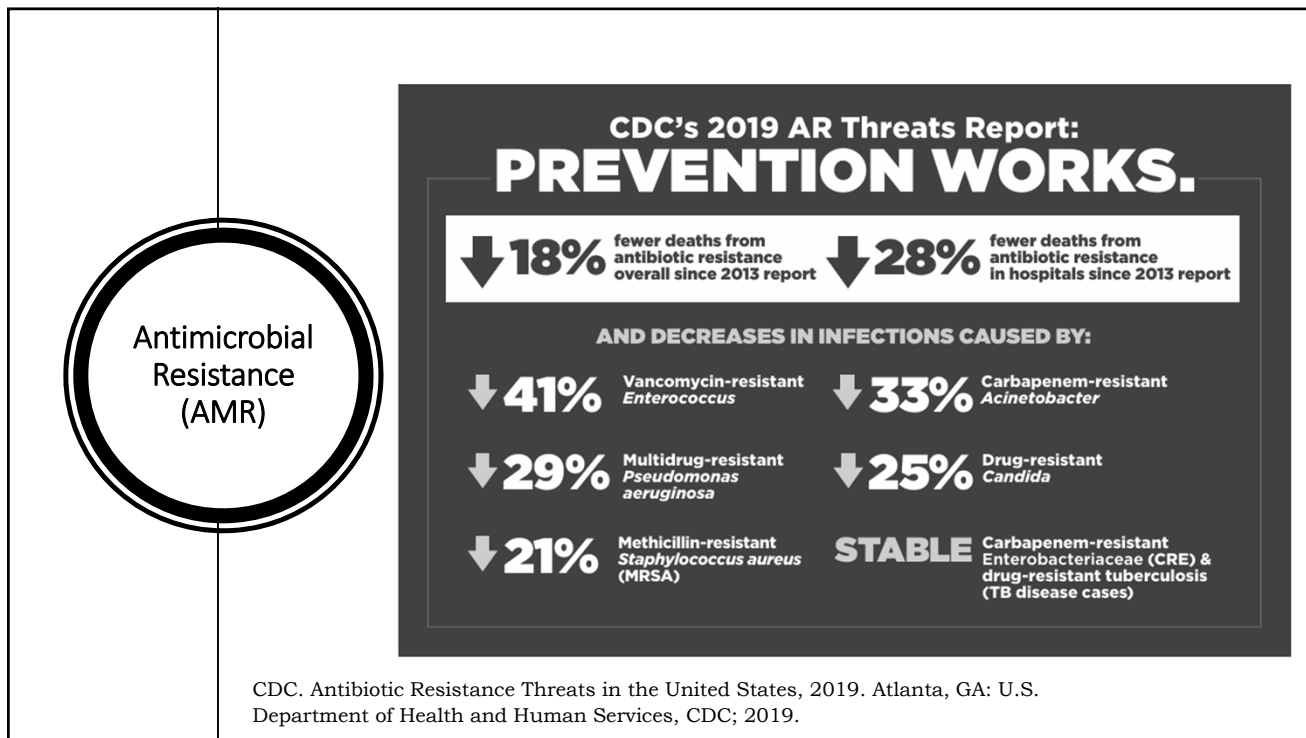
-A Public Health Action Plan to Combat Antimicrobial Resistance

CDC 1999

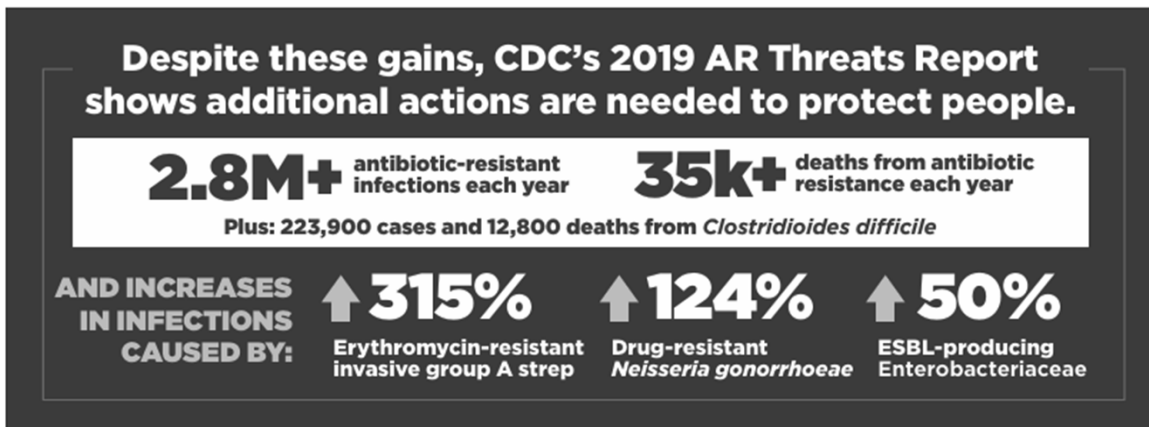
Background

- Antibiotics are unlike any other agent in that use in one patient can compromise efficacy in another
- Prevalent use
 - 200-300 million antibiotic prescriptions annually
 - 45% outpatient
- 25-40% of hospitalized patients receive antibiotics
 - 10-70% are unnecessary or sub-optimal
 - 5% of hospitalized patients who receive antibiotics experience an adverse reaction
- Changes in antibiotic use are paralleled by changes in resistance patterns

Klevens et al. *Public Health Rep.* 2007;122(2):160-166.
Stone et al. *Am J Inf Control.* 2005;33(9):542-547.



AMR Challenges



CDC. Antibiotic Resistance Threats in the United States, 2019. Atlanta, GA: U.S. Department of Health and Human Services, CDC; 2019.

Challenges in healthcare:	Challenges in the community:
 Preventing the spread of germs, including in non-hospital settings such as long-term care facilities	 Poor hygiene, such as not keeping hands clean or not wiping properly after toileting or diapering
 Spread of germs from the healthcare environment (e.g., bedrails, devices, other surfaces)	 Spread of resistant threats in the food supply
 Incomplete adoption of the Containment Strategy	 Inconsistent use of safer sex practices
 Inconsistent implementation of some CDC recommendations (e.g., Contact Precautions)	 Few vaccines to prevent infections and spread of resistant threats
 Introduction of emerging threats from outside of the United States	 Stopping spread of germs in animals
 Continued vigilance against serious threats like "nightmare bacteria" CRE	 Understanding the role of antibiotic-resistant germs in the environment
	 Improving antibiotic use everywhere

For further progress, the nation must continue to innovate and scale up effective strategies to prevent infections, stop spread, and save lives.

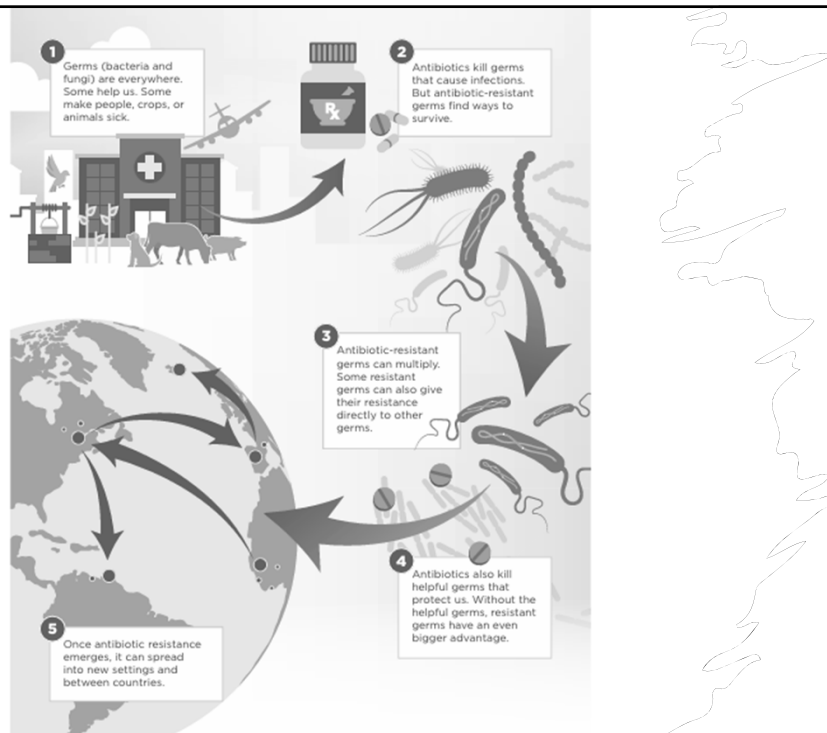
Learn more:
www.cdc.gov/DrugResistance/Biggest-Threats





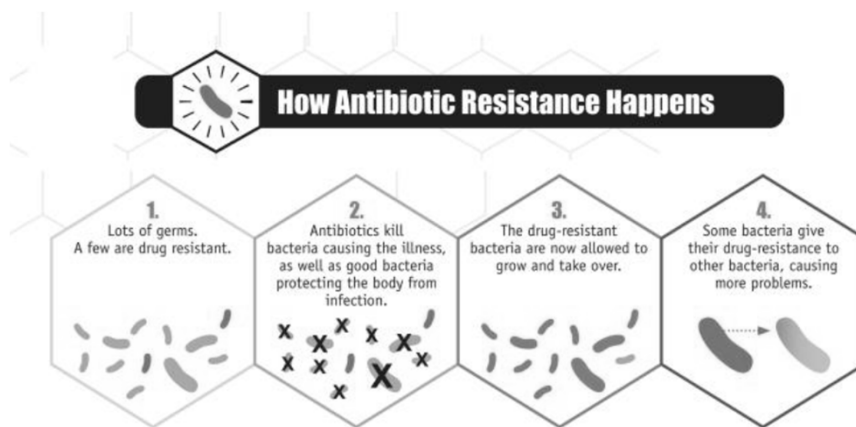
CDC. Antibiotic Resistance Threats in the United States, 2019. Atlanta, GA: U.S. Department of Health and Human Services, CDC; 2019.

How Antibiotic Resistance Spreads



CDC. Antibiotic Resistance Threats in the United States, 2019. Atlanta, GA: U.S. Department of Health and Human Services, CDC; 2019.

Bacterial Resistance



CDC's *Antibiotic Resistance Threats in the United States, 2019*

Antibiotic Resistance Can Emerge Quickly

Antibiotic Approved or Released	Year Released	Resistant Germ Identified	Year Identified
Penicillin	1941	Penicillin-resistant <i>S. aureus</i>	1942
Methicillin	1960	MRSA	1960
Extended-spectrum cephalosporins	1980	ESBL-producing <i>E. coli</i>	1983
Daptomycin	2003	Daptomycin-resistant MRSA	2004
Ceftazidime-avibactam	2015	Ceftazidime-avibactam KPC-producing <i>K. pneumoniae</i>	2015

The Threat of Antibiotic Resistance in the United States

Antibiotic resistance—when germs (bacteria, fungi) develop the ability to defeat the antibiotics designed to kill them—is one of the greatest global health challenges of modern time.

New National Estimate*

Each year, antibiotic-resistant bacteria and fungi cause at least an estimated:

- 2,868,700** infections
- 35,900** deaths

+ Clostridioides difficile is related to antibiotic use and antibiotic resistance:**

- 223,900** cases
- 12,800** deaths

New Antibiotic Resistance Threats List
Updated urgent, serious, and concerning threats—totaling 18

- 5** urgent threats
- 2** new threats
- NEW:** Watch List with **3** threats

Antibiotic resistance remains a significant One Health problem, affecting humans, animals, and the environment. Data show infection prevention and control is saving lives—especially in hospitals—but threats may undermine this progress without continued aggressive action now.

Learn more: www.cdc.gov/DrugResistance/Biggest-Threats.html

CDC Antibiotic Resistance Threat Report

ANTIBIOTIC RESISTANCE THREATS
IN THE UNITED STATES
2019



U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

Revised Dec. 2019

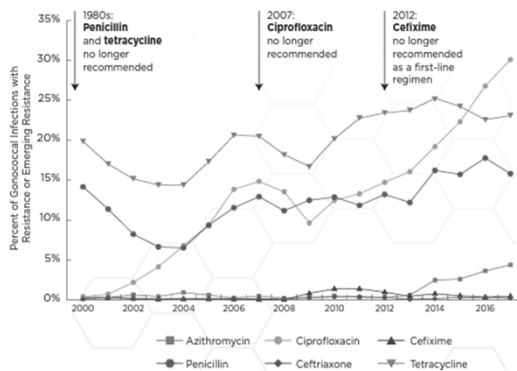
**DRUG-RESISTANT
NEISSERIA GONORRHOEAE**

THREAT LEVEL **URGENT**

- 550,000** Estimated drug-resistant infections each year
- 1.14M** Total new infections each year
- \$133.4M** Annual discounted lifetime direct medical costs

Neisseria gonorrhoeae causes gonorrhea, a sexually transmitted disease (STD) that can result in life-threatening ectopic pregnancy and infertility, and can increase the risk of getting and giving HIV.

- Gonorrhea spreads easily & is often asymptomatic
- Can cause serious health issues including ectopic pregnancy and infertility
- Timely diagnosis & routine screening with prompt & effective treatment is crucial
- Ceftriaxone last reliable agent
- CDC STI Treatment Guidelines excellent resource



CDC. Antibiotic Resistance Threats in the United States, 2019. Atlanta, GA: U.S. Department of Health and Human Services, CDC; 2019.

EXTENDED-SPECTRUM BETA-LACTAMASE (ESBL) PRODUCING ENTEROBACTERIACEAE

THREAT LEVEL **SERIOUS**

- 197,400** Estimated cases in hospitalized patients in 2017
- 9,100** Estimated deaths in 2017
- \$1.2B** Estimated attributable healthcare costs in 2017

ESBL-producing Enterobacteriaceae (a family of different types of bacteria) are a concern in healthcare settings and the community. They can spread rapidly and cause or complicate infections in healthy people.

- Infections include UTIs, intra-abdominal infections, pneumonia, and bacteremia
- ESBL enzymes easily spread from one bacteria to another
- Hydrolyze penicillins and cephalosporins
 - May require hospitalization for IV carbapenem therapy (unless urinary isolate susceptible to PO options)



CDC's Antibiotic Resistance Threats in the United States, 2019

METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS
THREAT LEVEL **SERIOUS**

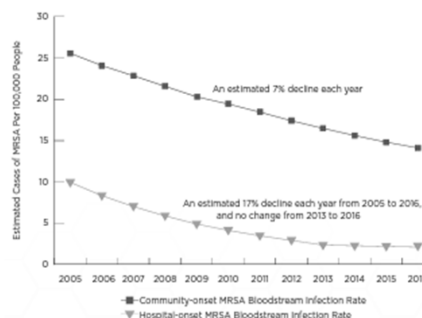
323,700 Estimated cases in hospitalized patients in 2017

10,600 Estimated deaths in 2017

\$1.7B Estimated attributable healthcare costs in 2017

Staphylococcus aureus (S. aureus) are common bacteria that spread in healthcare facilities and the community. Methicillin-resistant *S. aureus* (MRSA) can cause difficult-to-treat staph infections because of resistance to some antibiotics.

- Hospital reductions in MRSA have stalled
- Community MRSA infections may be connected to the opioid crisis
- Now resistant to many first-line options including clindamycin



CDC. Antibiotic Resistance Threats in the United States, 2019. Atlanta, GA: U.S. Department of Health and Human Services, CDC; 2019.

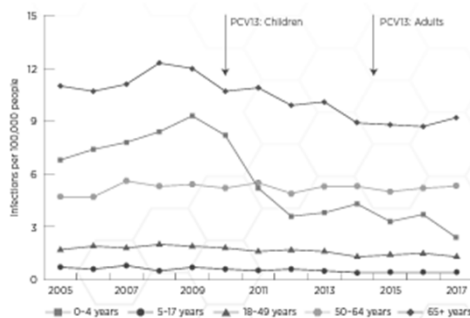
DRUG-RESISTANT STREPTOCOCCUS PNEUMONIAE
THREAT LEVEL **SERIOUS**

900,000 Estimated infections in 2014

3,600 Estimated deaths in 2014

Streptococcus pneumoniae (pneumococcus) is a leading cause of bacterial pneumonia and meningitis in the United States. It also is a common cause of bloodstream infections, and ear and sinus infections.

- One of the only drug-resistant bacteria with an effective vaccine to prevent infections
- Encouraging vaccination can slow the spread of pneumococcal resistance
- Resistance to penicillin (PO), tetracycline, and erythromycin common



CDC. Antibiotic Resistance Threats in the United States, 2019. Atlanta, GA: U.S. Department of Health and Human Services, CDC; 2019.

ERYTHROMYCIN-RESISTANT GROUP A *STREPTOCOCCUS*

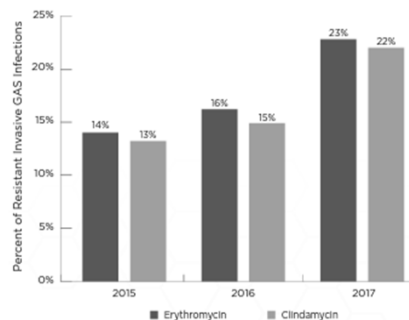
THREAT LEVEL **CONCERNING**

5,400 Estimated infections in 2017

450 Estimated deaths in 2017

Group A *Streptococcus* (GAS) bacteria can cause mild infections such as sore throat and impetigo, and severe invasive disease such as cellulitis, pneumonia, flesh-eating infections, and sepsis.

- Implicated in “strep throat”
- No resistance to penicillin/amoxicillin but allergies commonly reported
- Resistance to erythromycin and clindamycin is rising



CDC. Antibiotic Resistance Threats in the United States, 2019. Atlanta, GA: U.S. Department of Health and Human Services, CDC; 2019.

CLINDAMYCIN-RESISTANT GROUP B *STREPTOCOCCUS*

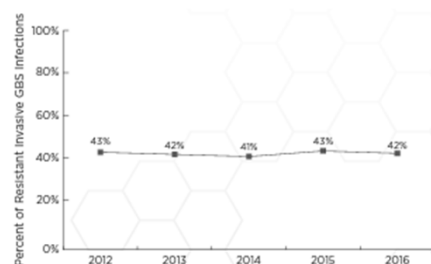
THREAT LEVEL **CONCERNING**

13,000 Estimated infections in 2016

720 Estimated deaths in 2016

Group B *Streptococcus* (GBS) is a type of bacteria that can cause severe illnesses—including bloodstream infections, pneumonia, meningitis, and skin infections—in people of all ages.

- Can be passed from mother to infant during labor threatening newborns with sepsis
- Clindamycin resistance limits prevention and treatment options for adults with severe penicillin allergies



CDC. Antibiotic Resistance Threats in the United States, 2019. Atlanta, GA: U.S. Department of Health and Human Services, CDC; 2019.



Antimicrobial Stewardship 101

Sydney Agnello, DO

Assistant Professor

Infectious Diseases

The Ohio State University Wexner Medical Center

MedNet21
Center for Continuing Medical Education

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Objectives

- Examine the core elements of outpatient antimicrobial stewardship
- Discover resources available (🔍 QR codes)
- Discern how to best implement in your clinical setting



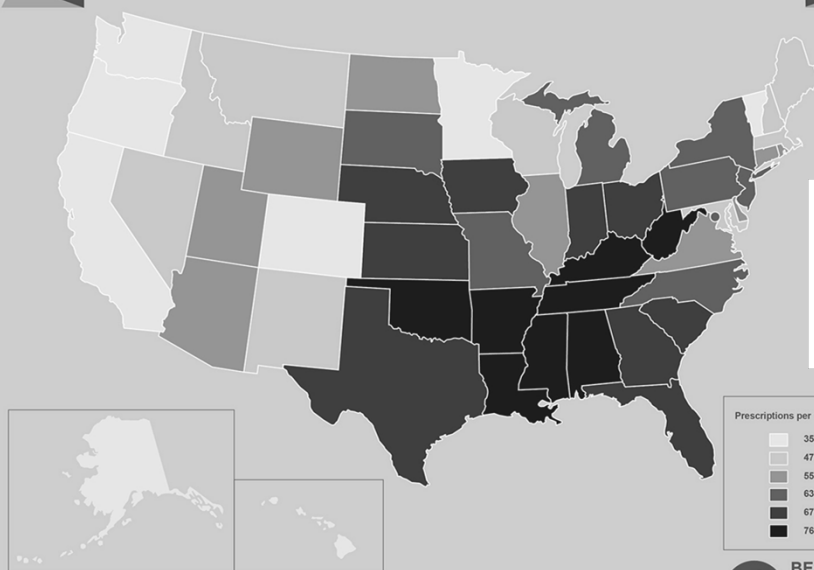
Inpatient Antimicrobial Stewardship

- Required at all hospitals by Joint Commission
- Encountering these efforts daily while rounding
 - Restricted antimicrobials
 - Prospective audits with intervention & feedback
 - IV to oral conversion of antimicrobials
 - Education
 - Guidelines & clinical pathways



OUTPATIENT

Antibiotic Prescriptions per 1,000 Population by State - 2021



U.S. average
211.1 million
antibiotic
prescriptions

Data source: IQVIA Xponent 2021
CS334840-A

<https://www.cdc.gov/antibiotic-use/images/2021-Report-Map.jpg>



IMPROVE OUTPATIENT ANTIBIOTIC USE

CS336777-A

72%
of antibiotic
prescriptions
are likely
necessary.

(But we still need
to improve drug
selection, dose
and duration)



At least
28%
of antibiotic
prescriptions
are unnecessary.
In U.S Doctor's
Offices and EDs



**BE
ANTIBIOTICS
AWARE**
SMART USE, BEST CARE

Learn more at
[cdc.gov/antibiotic-use](https://www.cdc.gov/antibiotic-use).



<https://www.cdc.gov/antibiotic-use/week/images/Improve-Outpatient-Antibiotic-Use.jpg>

Total inappropriate antibiotic use

50%



Unnecessary
use



Inappropriate
Selection



Inappropriate
Dosing

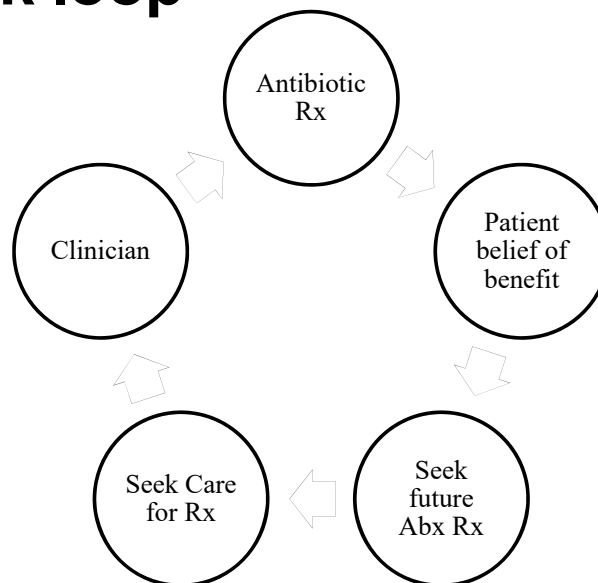


Inappropriate
Duration

Reasons behind inappropriate Rx

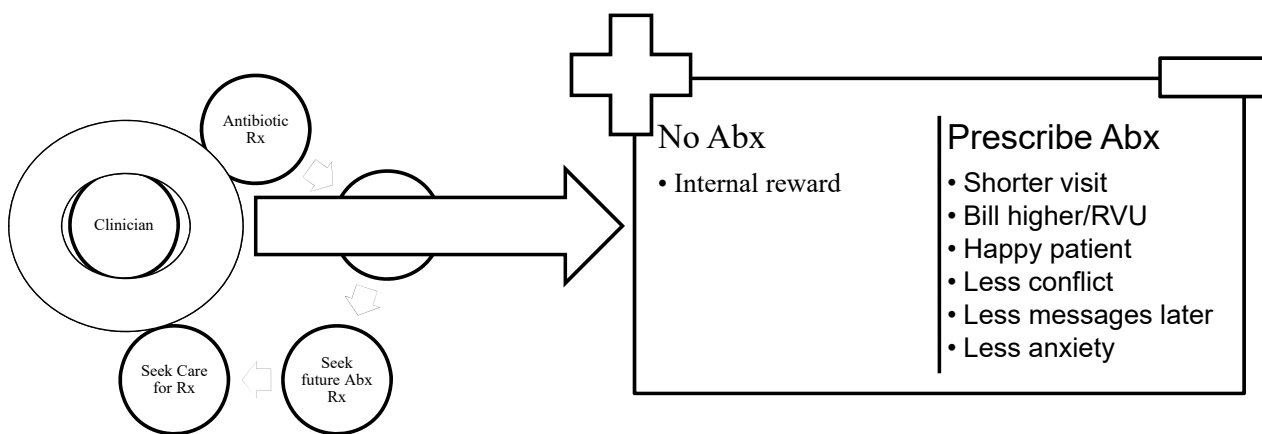
- Primarily psychologically & socially rooted
 - Rx is a **BEHAVIOR**, not a scientific decision
- Lack of awareness
 - Clinicians do not perceive they are prescribing inappropriately
- Misaligned incentives
- Inadequate knowledge regarding guidelines
- Fear from complications of infections
- All complicated by a feedback loop

Feedback loop



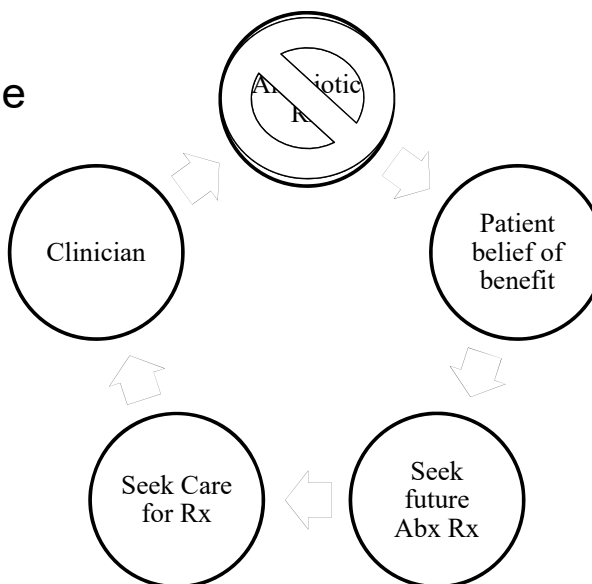
Shi Z, Barnett ML, Jena AB, Ray KN, Fox KP, Mehrotra A. Association of a Clinician's Antibiotic-Prescribing Rate With Patients' Future Likelihood of Seeking Care and Receipt of Antibiotics. *Clin Infect Dis*. 2021 Oct 5;73(7):e1672-e1679. doi: 10.1093/cid/ciaa1173.

Feedback loop



Feedback loop

- We are part of the cycle
- We **can** change
- Our patients behavior **WILL** change



CDC Core Elements of Outpatient Antimicrobial Stewardship



<https://www.cdc.gov/antibiotic-use/core-elements/outpatient.html>

CDC Core Elements of Outpatient ASP

- **Commitment**
 - Dedication to appropriate antibiotic prescription & patient safety
- Action for policy & practice
- Tracking & reporting
- Education & expertise

Commitment

- Display **public commitments** in support of ASP
- Identify a **leader** to direct activities within a facility
- Communicate with **all clinic staff** members to set patient expectations
 - This includes front desk, medical assistants, nurses, administrative staff

Commitment Poster

- In 2014 study by Meeker et al, evaluated use of poster in exam rooms effect on antibiotic prescriptions in acute URI
- Result: 19.7% absolute percentage reduction of inappropriate antibiotic prescribing rate relative to control
 - Results did not diminish over time

Commitment Poster



Antibiotics are powerful, lifesaving medications. We are **dedicated** to prescribing antibiotics when they are needed, and we will avoid prescribing antibiotics when they are not needed as they may do harm. When your healthcare professional prescribes antibiotics, take them as directed.

Antibiotics fight infections caused by **bacteria**. Antibiotics don't work against **viruses** that cause the common cold, most coughs, and sore throats.

You can experience side effects while taking antibiotics. Common side effects could include a skin rash, diarrhea, or a yeast infection. More serious side effects could include a *C. diff* infection, which causes severe diarrhea that can lead to severe colon damage and death.

Using antibiotics also gives bacteria a chance to become more resistant to them. This can make future infections harder to treat, which means that antibiotics might not work when you really do need them.

Taking antibiotics only when needed helps keep you healthy, helps fight antibiotic resistance, and ensures that these life-saving drugs will be available for future generations.

We will answer any questions about the role of antibiotics in your treatment.

Sincerely,



To learn more about antibiotic prescribing and use, visit www.cdc.gov/antibiotic-use or call 1-800-CDC-INFO.



Source: cdc.gov

Commitment Poster



Antibiotics Aren't Always The Answer

Antibiotics save lives. When a patient needs antibiotics, the benefits outweigh the risks of side effects or antibiotic resistance. When antibiotics aren't needed, they won't help you, and the side effects could still harm you.

At Ohio State, we're committed to appropriate antibiotic prescribing. We're doing our part in the fight against antibiotic resistance.



YOUR OHIO STATE
PRIMARY CARE PROVIDERS

Read more at go.osu.edu/antibiotic



Commitment Poster - Minnesota



Commitment Poster - DIY



<https://www.health.mn.gov/diseases/antibioticresistance/hcp/commitkit>

CDC Core Elements of Outpatient ASP

- Commitment
- **Action for policy & practice**
 - Implement at least one policy or practice to improve, assess if it works & modify as needed
- Tracking & reporting
- Education & expertise

Action for Policy & Practice

- Use **evidence-based diagnostic criteria & treatment recommendations**
- Use delayed prescribing practices or watchful waiting, when appropriate
 - Acute otitis media, sinusitis, etc

CDC treatment guidelines

<https://www.cdc.gov/antibiotic-use/clinicians/adult-treatment-rec.html>



Action for Policy & Practice

- Support for clinical decisions
- Utilizing call centers or RN hotlines as triage to prevent unnecessary visits

Action - Over the Counter “Prescription Pad”

- Education for patients on how to manage symptom control in acute respiratory illness
- Improves efficiency for clinician, decreases errors & allows for transaction to occur
 - ALL improve patient satisfaction

Over the Counter “Prescription Pad”

Symptom Relief for Viral Illnesses



1. DIAGNOSIS

- Cold or cough
- Middle ear fluid
(Circle Redness with Effusion, OME)
- Flu
- Viral sore throat
- Bronchitis
- Other: _____

You have been diagnosed with an illness caused by a virus. Antibiotics do not work on viruses. When antibiotics aren't needed, they won't help you, and the side effects could still hurt you. The treatments prescribed below will help you feel better while your body fights off the virus.

2. GENERAL INSTRUCTIONS

- Drink extra water and fluids.
- Use a cool mist vaporizer or saline nasal spray to relieve congestion.
- For sore throats in older children and adults, use ice chips, sore throat spray, or lozenges.
- Use honey to relieve cough. Do not give honey to an infant younger than 1.

3. SPECIFIC MEDICINES

- Fever or aches:
- Ear pain:
- Sore throat and congestion:

Use medicines according to the package instructions or as directed by your healthcare professional. Stop the medication when the symptoms get better.

4. FOLLOW UP

- If not improved in _____ days/hours, if new symptoms occur, or if you have other concerns, please call or return to the office for a recheck.
- Phone: _____
- Other: _____

Signed: _____
To learn more about antibiotic prescribing and use, visit www.cdc.gov/antibiotic-use.



Source: cdc.gov

Over the Counter “Prescription Pad”

THE OHIO STATE UNIVERSITY
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Patient name _____

Date _____

Diagnosis _____

Instructions

Viruses can't be treated with an antibiotic. To help your body heal and feel better, use the treatments below while your body fights off the virus. Use only while symptoms persist.

Medicines for Symptom Relief in Adults

Try to only use medicines that take care of your symptoms as marked below by your provider. Medicines used to treat many symptoms can have several active drugs listed and may cause side effects you do not expect. Look on the medicine labels to find the active ingredients listed in this chart. Show this sheet to your pharmacist if you need help finding the right medicine. Use as directed on the package.

Symptoms	Recommended by your physician	Medicine
Aches, pain, fever	<input type="checkbox"/>	Acetaminophen (Tylenol)
	<input type="checkbox"/>	Ibuprofen (Advil, Motrin)
	<input type="checkbox"/>	Naproxen (Aleve)
Sore throat	<input type="checkbox"/>	Throat lozenges (Cepacol, Screts)
	<input type="checkbox"/>	Throat sprays (Chloraseptic)
	<input type="checkbox"/>	Herbal tea with honey (Throat Coat)
	<input type="checkbox"/>	Warm salt water gargle

(over)



Symptoms	Recommended by your physician	Medication
Cough	<input type="checkbox"/>	Guafenesin and dextromethorphan (Mucinex DM, Tussin DM, Robitussin DM)
	<input type="checkbox"/>	Guafenesin (Mucinex)
	<input type="checkbox"/>	Dextromethorphan (Delsym, Robitussin, Vicks Formula 44)
	<input type="checkbox"/>	Menthol (Vicks VapoRub, Halls cough drops)
	<input type="checkbox"/>	Honey
Stuffy nose	<input type="checkbox"/>	Pseudoephedrine (Sudafed Decongestant—12 hour)
	<input type="checkbox"/>	Phenylephrine (Sudafed PE, Little Colds)
	<input type="checkbox"/>	Chlorpheniramine (Coricidin HBP, Chlor-Tab, Chlor-Trimeton)
	<input type="checkbox"/>	Non-drowsy antihistamine: loratadine (Claritin), cetirizine (Zyrtec) or fexofenadine (Allegra)
	<input type="checkbox"/>	Decongestant nose spray* with xylometazoline (Otrivin), oxymetazoline (Afrin, Allerest) or phenylephrine (NeoSynephrine) <small>*Use for up to 3 days maximum</small>
Other	<input type="checkbox"/>	Nasal Irrigation (saline spray)
	<input type="checkbox"/>	Nasal steroids (flonase, Nasonex, Rhinocort)



CDC Core Elements of Outpatient ASP

- Commitment
- Action for policy & practice
- **Tracking & reporting**
 - Monitor antibiotic prescribing practices & offer regular feedback to clinicians or have them monitor themselves
- Education & expertise

Tracking & Reporting

- Self-evaluate antibiotic prescription practices
- Participate in CME & QI activities
- Implement at least one antibiotic prescription tracking & reporting system
- Assess & share performance on quality measures & established reduction goals
 - HEDIS measures

Tracking & Reporting – CDC



Contents

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<https://www.cdc.gov/antibiotic-use/pdfs/Measurement-Evaluation-Improve-Outpatient-508.pdf>

Tracking & Reporting

- OASIS Stewardship Simplified

The screenshot shows the OASIS Stewardship Simplified website. At the top is the OASIS logo and navigation links: ABOUT, PROJECTS, RESOURCES, FAQ, CONTACT, LOGIN, and SIGN UP. The main heading is 'Projects', followed by a sub-heading: 'Check out these OASIS projects from health systems across the country. To see the full project details, please log in.' Below this are four filter dropdown menus: Date (Year), Patient Demographic, Project Area of Interest, and Project Setting, all currently set to 'All Items'. The main content area displays three project cards:

- Denver Health:** Antibiotic Utilization for Acute Respiratory Conditions (AXR) and Tier 3 Conditions. Includes a 'See project details' button.
- Kentucky Antibiotic Awareness:** Kentucky Medicaid Provider Feedback on Antibiotic Prescribing to Children. Includes a 'See project details' button.
- Denver Health:** Acute Otitis Media First Line Treatment and Antibiotic Duration. Includes a 'See project details' button.



<https://oasisstewardship.org/>

CDC Core Elements of Outpatient ASP

- Commitment
- Action for policy & practice
- Tracking & reporting
- **Education & expertise**
 - Provide educational resources to clinicians & patients on antibiotic prescribing
 - Ensure access to needed expertise on optimizing antibiotic prescribing

Education & Expertise

- Educate patients about
 - when antibiotics are needed & not needed
 - potential harms of antibiotics treatments
 - risks of antimicrobial resistance
- Discussing antibiotic allergy versus intolerance
 - Penicillin allergies...



Education & Expertise

- Educate patients – CDC infographics

Common Respiratory Infections
Do you need antibiotics?



Antibiotics **DO NOT WORK** against viruses that cause the common cold, most chest colds, flu, and COVID-19. Ask your healthcare professional about the best way to feel better while your body fights off the virus.

For more information, visit www.cdc.gov/antibiotic-use or call 1-800-CDC-INFO.



C3335340-A



Education & Expertise

- Communication skills training for clinicians
 - Providers poorly predict when patients want antibiotics
 - **DART – Dialogue Around Respiratory Illness Treatment modules**
 - Free online (directed towards parents of children)
 - <https://www.uwimtr.org/dart/>



ASP → in practice

- Patient with pharyngitis



ASP → in practice

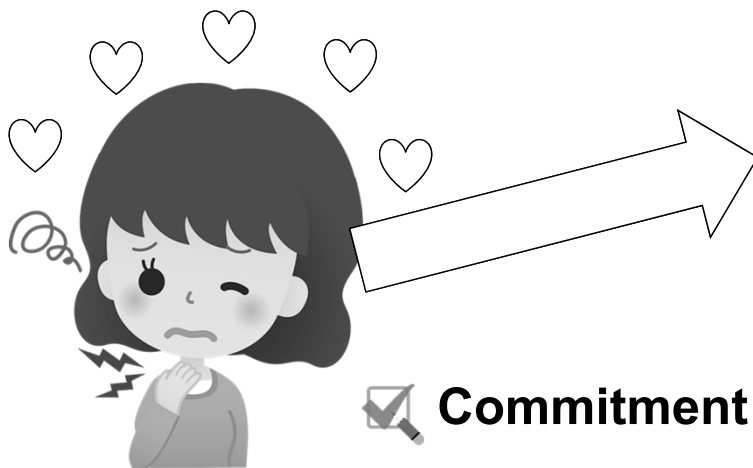
- Patient calls with complaint of sore throat
- **Triage line:** recommends patient present to clinic for further evaluation



Commitment & Policy

ASP → in practice

- Patient sees poster in exam room



 **Commitment**

ASP → in practice



MA sets expectations

- Does NOT promise antibiotics
- Reassure patient they will get great care



 **Commitment & Policy**

Policy & Practice – pharyngitis



Evidence based diagnostic criteria

Centor criteria (>2)

- Fever
- Tonsillar exudates
- Tender cervical lymphadenopathy
- Absence of cough



Rapid antigen detection test



 No antibiotics



 Antibiotics recommended

<https://www.cdc.gov/antibiotic-use/clinicians/adult-treatment-rec.html>

Policy & Practice – pharyngitis



Evidence based treatment




- + Centor → + RADT → Antibiotics for GAS
- Pick the correct antibiotic for the correct duration
- You appropriately select amoxicillin for 10 days... until patient **declares PCN allergy**

Education – pharyngitis



- Discuss allergy further 




- Recall GAS antibiotic resistance to azithromycin & clindamycin are increasingly common 

Source: cdc.gov

Education – pharyngitis



- Discuss allergy further 

- Decide amoxicillin is safe to use, educate patient AND adjust flag in the chart / EMR 



ASP – pharyngitis

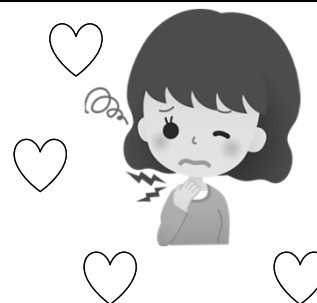
- + Centor → - RADT → **No Antibiotics**



 **Evidence based diagnostic criteria**

ASP– pharyngitis

- + Centor → - RADT → **No Antibiotics**
- Astute clinician you suspect it is likely viral
 - Educate patient



 **Effective Education**

- Provide supportive care recommendations

 **Policy & practice**



THE OHIO STATE UNIVERSITY
WEXNER MEDICAL CENTER Rx

Patient name _____
Date _____


Diagnosis _____

Instructions
Sorens can't be treated with an antibiotic. To help your body heal and feel better, use the treatments below while your body fights off the virus. Use only while symptoms persist.

Medicines for Symptom Relief in Adults
By to only use medicines that take care of your symptoms as marked below by your provider. Medicines used to treat more symptoms can have several active drugs listed and may cause side effects you do not expect. Look on the medicine label to find the active ingredients listed in this chart. Show this sheet to your pharmacist if you need help finding the right medicine. Use as directed on the package.

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	<input type="checkbox"/>	Ibuprofen (Advil, Motrin)
	<input type="checkbox"/>	Naproxen (Aleve)
Sore throat 	<input type="checkbox"/>	Throat lozenges (Capsoic, Suave)
	<input type="checkbox"/>	Throat sprays (Chloraseptic)
	<input type="checkbox"/>	Herbal tea with honey (Throat Coat)
	<input type="checkbox"/>	Warm salt-water gargle

(over)



Tracking – pharyngitis



- Depending on size of practice this can vary
- **Example:**
 - **Review rapid test results & antimicrobial use**
 - Even small chart review can be beneficial
 - **HEDIS measure for pharyngitis**
 - **OASIS project**



Tracking



All Healthcare Professionals
can *Be Antibiotics Aware*



**BE
ANTIBIOTICS
AWARE**
SMART USE, BEST CARE



For more information, visit www.cdc.gov/antibiotic-use.



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