Texas Hospital Association Foundation

NUGGETS OF KNOWLEDGE

Presented by Infection Control Consultants of New Mexico

ICCNM

Infection Control Consultants of New Mexico

Welcome

IC Nuggets of Knowledge Series are monthly one-hour learning sessions using a web-based format to share information, network, and opportunity to address questions and concerns with ICCNM Consultants

When: 1:00 to 2:00 pm

2nd Thursday of the month

If you have feedback on this learning opportunity or have suggestions for future learning opportunities, feel free to reach out to me at any time!

- ncostilla@tha.org

Introductions

- Infection Control Consultants of NM (ICCNM Consulting)
- New Mexico based consulting company
- Consultants are certified in Infection Control (CIC)
- Presenters for this series
  - Kerry Flint, PhD
  - Terri Kangas-Feller
  - Barbara Mooney

- www.iccnm.org

Antimicrobial Resistance

Session Outline

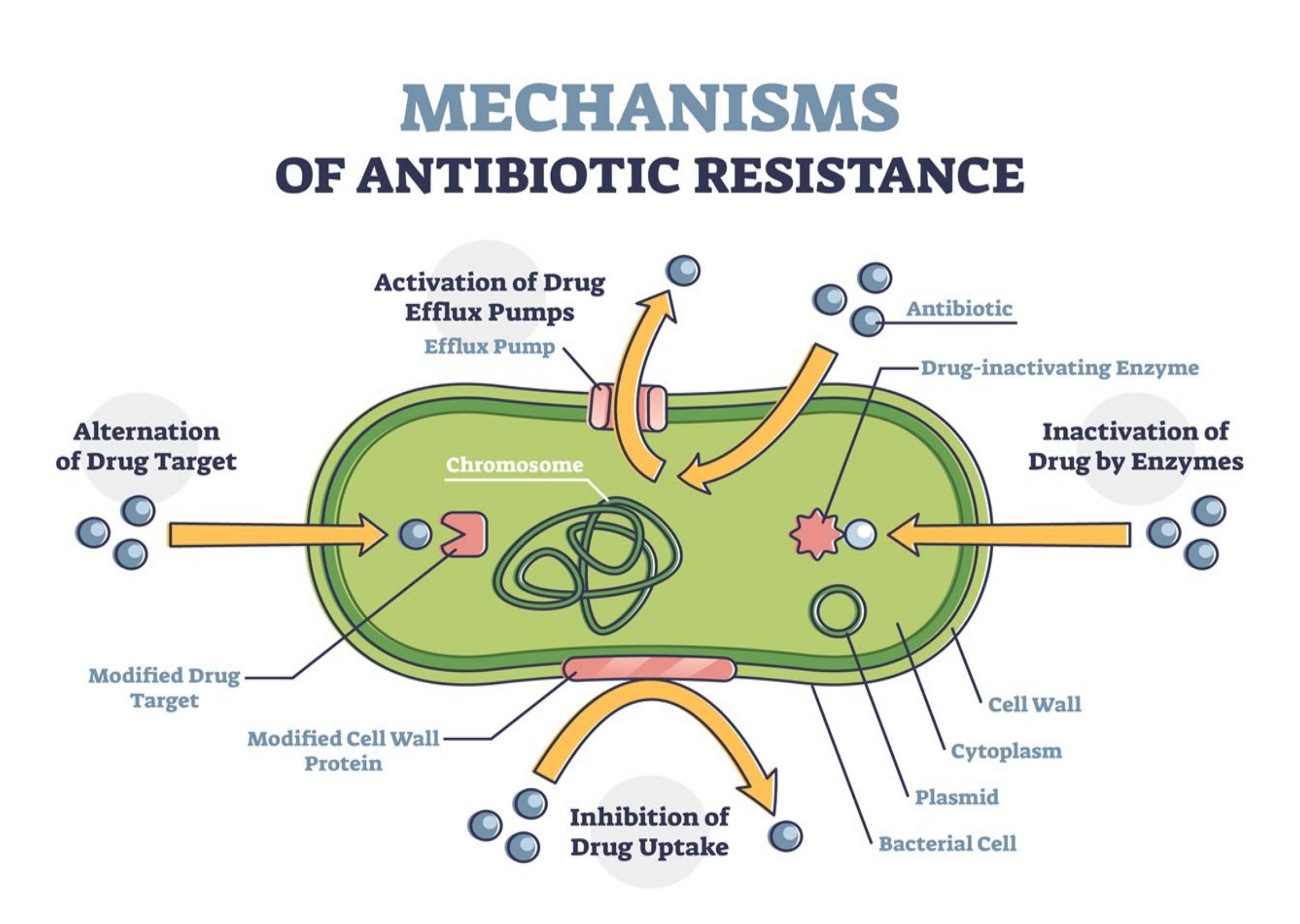
- Describe mechanisms of resistance
- Discuss the one-world approach to antimicrobial resistance.
- Discuss the role of the IP in antimicrobial stewardship programs.

Antimicrobial Resistance

Antibiotic resistance—the ability of germs to defeat the drugs designed to kill them—is one of the greatest global public health challenges of our time.

Antibiotic Resistance Threats in the United States, 2019

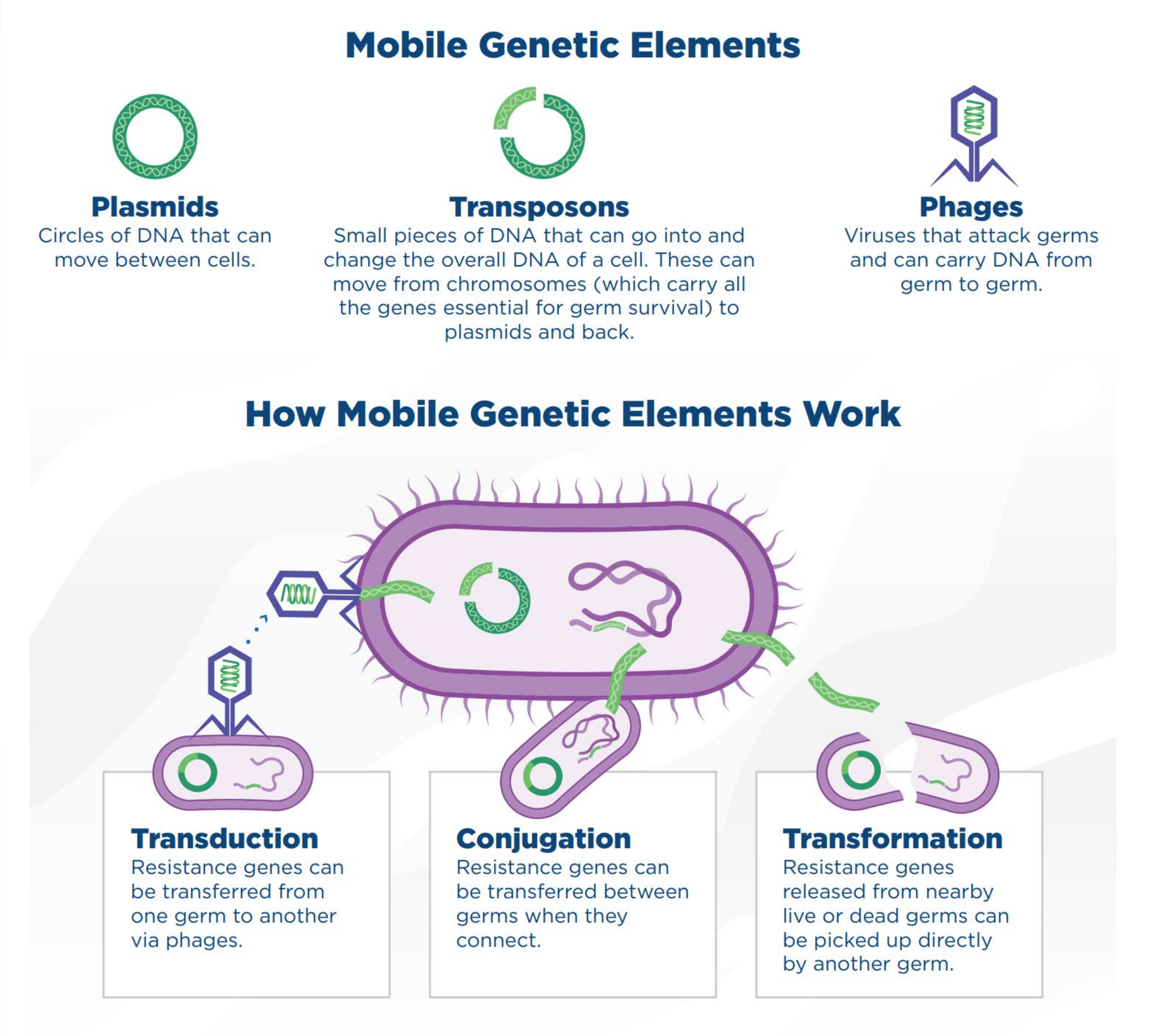
- Primary
  - Organism is naturally resistant to the drug
- Acquired
  - Mutation within the same specie or gene transfer between different species
- Cross-resistance
  - Resistance to one drug confers resistance to another similar drug



Licensed Adobe stock image

Gene Transfer

- Vertical
  - Generation to generation
- Horizontal
  - Passing from bacteria to bacteria



https://www.cdc.gov/drugresistance/pdf/threats-report/How-AR-Moves-508.pdf

CLASSIFICATION OF ANTIBIOTICS : AN OVERVIEW

Penicillins	Beta-Lactams	TetraCyclines	Macrolides	Sulfonamides & Trimethoprim	Antileprotic Drugs	Other Antibacterials
Benzyl penicillin and phenoxy penicillin	**Cephalosporins**	Tetracycline	Azithromycin	Trimethoprin sulfamethoxazole	Dapsone	Chloramphenicol (palmitate and succinate)
Benyl penicillin sodium (G)	Cefactor	Demeclocycline Hcl	Clarithromycin	Co-trimoxazole	Clofazimine	Fusidic acid
Phenoxymethylpenicillin (V)	Cefadroxil	Doxycycline	Erythromycin	Sulfadiazine	Rifampin	Polymyxins
Penicilinase resistant	Cefalexin	Lymecycline	Telithromycin	Trimethoprim	Ethionamde	Linezolid
Flucoxacillin	Cefixime	Minocycline	Roxithromycin	Sulfamethoxazole	Ofloxacin	Daptomycin
Temocillin	Cefotaxime	Oxytetracyeline	Spiramycin	Sulfadoxine	Clarithromycin	Vancomycin
Broad spectrum penicillins	Cefpodoxime	Tigecycline	**Clindamycin**	Sulfamethopyrazine	Minocycline	Rifaximin
Amoxicillin	Cefradine	**Aminoglycosides**	Lincomycin	Sulfacetamide	Prulifoxacin	Fidaxomicin
Ampicillin	Ceftazidime	Streptomycin	**Antitubercular drugs**	Sulfasalzine	Levofloxacin	
Co-amoxiclav	Ceftrioxone	Gentamicin	Capreomycin	Mafenide	Gatifloxacin	
Co-fluampicil	Cefuroxime	Amikacin	Cycloserine	Silver sulfadiazine	Gemifloxacin	
Bacampicillin		Neomycin	Ethambutol Hcl	Cotrimazine	**Quinolones**	**References:**
Antipseudomonal penicillins	**Carbapenems**	Tobramycin	Isoniazid	**Metronidazole And Tinidazole**	Ciprofloxacin	Doctor of Pharmacy blog
Piperacillin with tazobactum	Doripenem	Kanamycin	Pyrazinamide	Methronidazole	Levofloxacin	www.deepakpharmd.blogspot.in
Ticarcillin with clavulanic acid	Ertapenem	Sisomycin	Rifabutine	Tinidazole	Moxifloxacin	
Mecillinams	Imipenem with cilastatin	Netilmicin	Rifampicin	**UTI's**	Nalidixic acid	
Pivmecillinam Hcl	Meropenem	Framycetin	Streptomycin	Nitrofurantoin	Norfloxacin	
www.deepakpharmd.blogspot.in	Faropenem			Methenamice Hippurate	Ofloxacin	
	Others			Nalidixic acid	Pefloxacin	
	Aztreonam				Lomefloxacin	
					Sparfloxacin	

One Health is the idea that the health of people is connected to the health of animals and our shared environment.

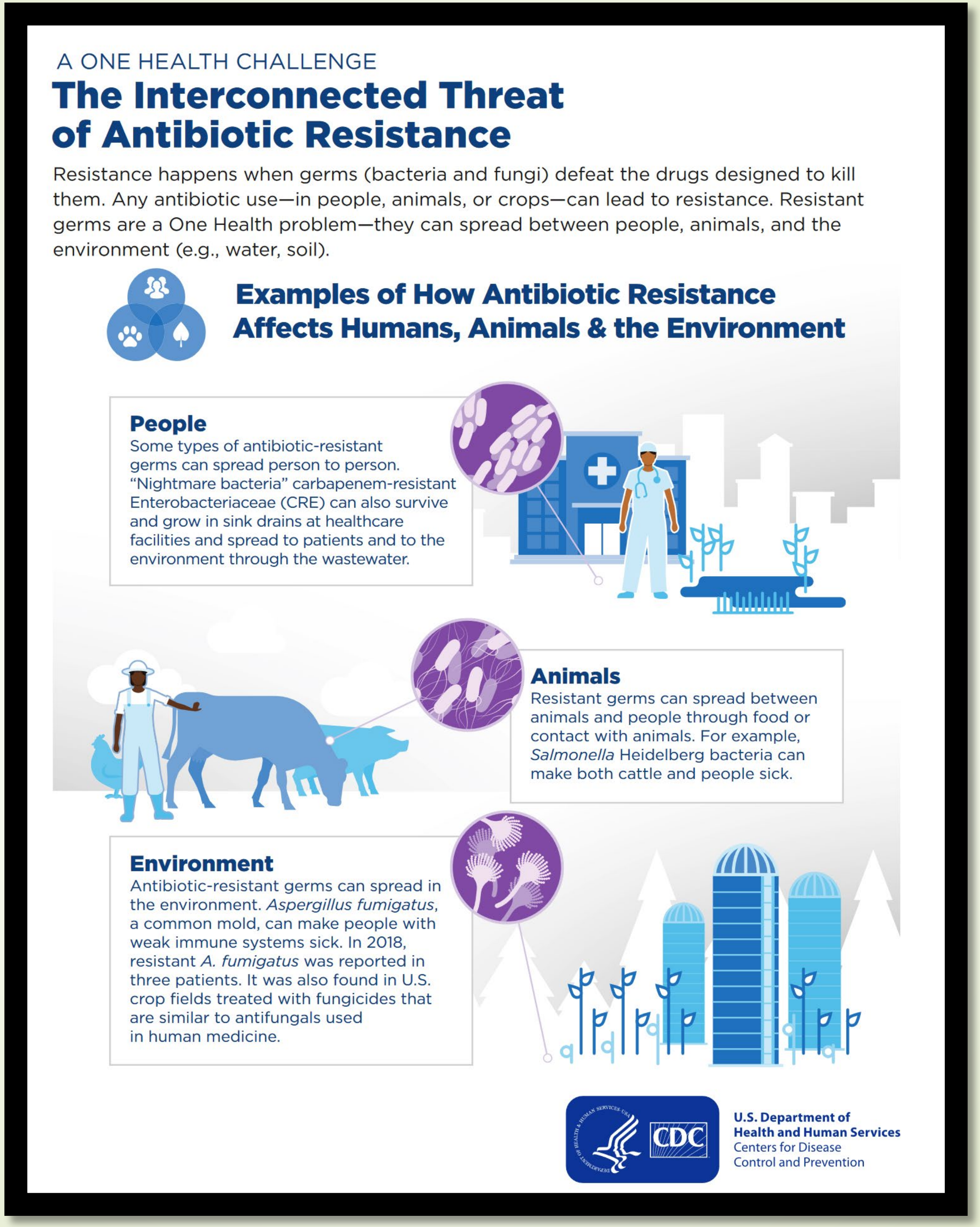
When we protect **one**, we help protect **all**.

www.cdc.gov/onehealth

One Health Perspective

- One Health is an approach that recognizes that the health of people is closely connected to the health of animals and our shared environment.
- Changes
  - Human populations are growing and expanding into new geographic areas.
  - The earth has experienced changes in climate and land use, such as deforestation and intensive farming practices.
  - The movement of people, animals, and animal products has increased from international travel and trade.
- One Health is a collaborative, multisectoral, and transdisciplinary approach — working at the local, regional, national, and global levels — with the goal of achieving optimal health outcomes recognizing the interconnection between people, animals, plants, and their shared environment.

https://www.cdc.gov/onehealth/basics/index.html



A ONE HEALTH CHALLENGE

The Interconnected Threat of Antibiotic Resistance

Resistance happens when germs (bacteria and fungi) defeat the drugs designed to kill them. Any antibiotic use—in people, animals, or crops—can lead to resistance. Resistant germs are a One Health problem—they can spread between people, animals, and the environment (e.g., water, soil).

Examples of How Antibiotic Resistance Affects Humans, Animals & the Environment

People

Some types of antibiotic-resistant germs can spread person to person. "Nightmare bacteria" carbapenem-resistant Enterobacteriaceae (CRE) can also survive and grow in sink drains at healthcare facilities and spread to patients and to the environment through the wastewater.

Animals

Resistant germs can spread between animals and people through food or contact with animals. For example, *Salmonella* Heidelberg bacteria can make both cattle and people sick.

Environment

Antibiotic-resistant germs can spread in the environment. *Aspergillus fumigatus*, a common mold, can make people with weak immune systems sick. In 2018, resistant *A. fumigatus* was reported in three patients. It was also found in U.S. crop fields treated with fungicides that are similar to antifungals used in human medicine.

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

https://www.cdc.gov/drugresistance/pdf/threats-report/One-Health-Challenge-508.pdf

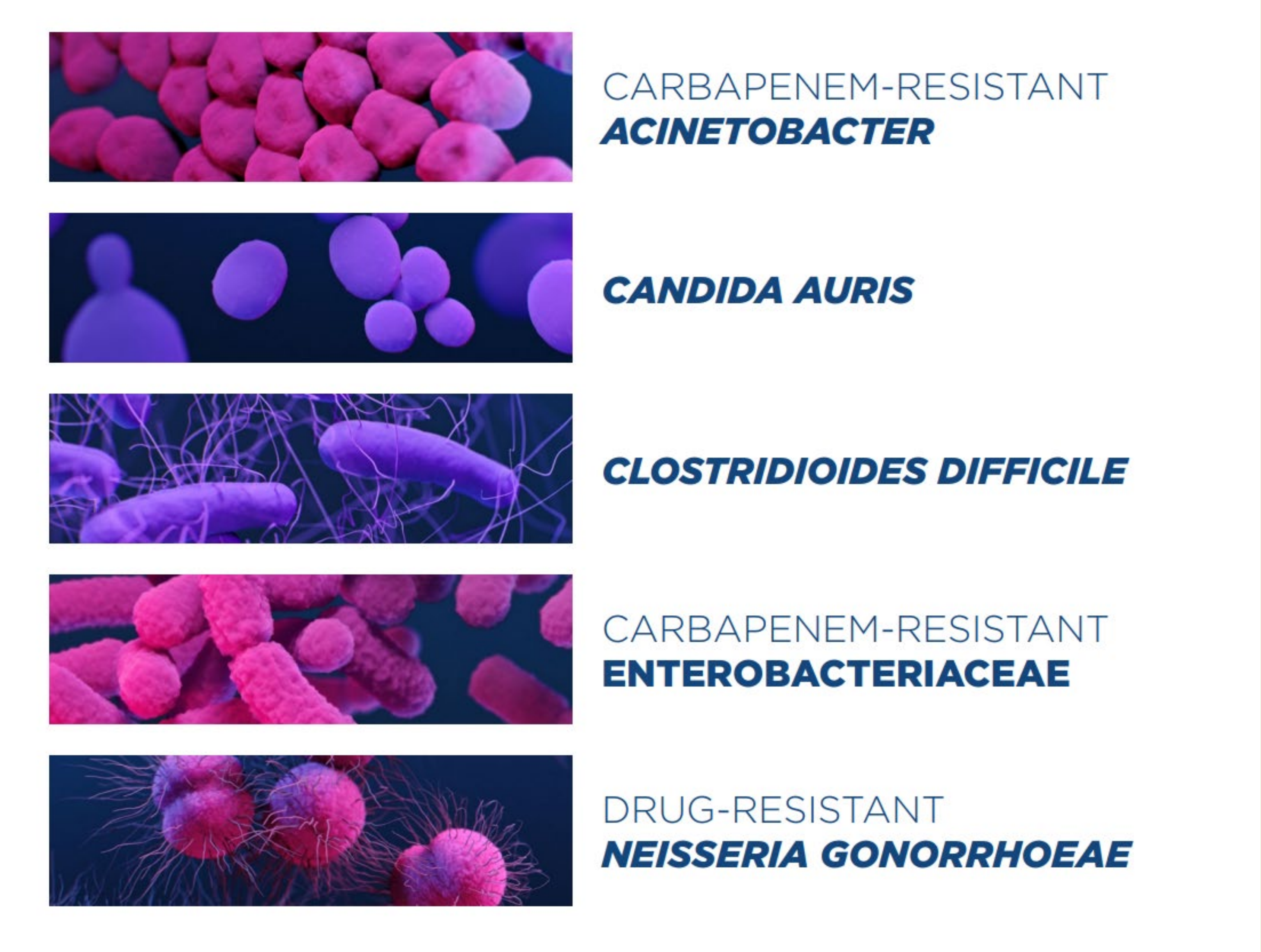
Travel

CDC Threat Report

- Categorized as:
  - Urgent
  - Serious
  - Concerning

Urgent

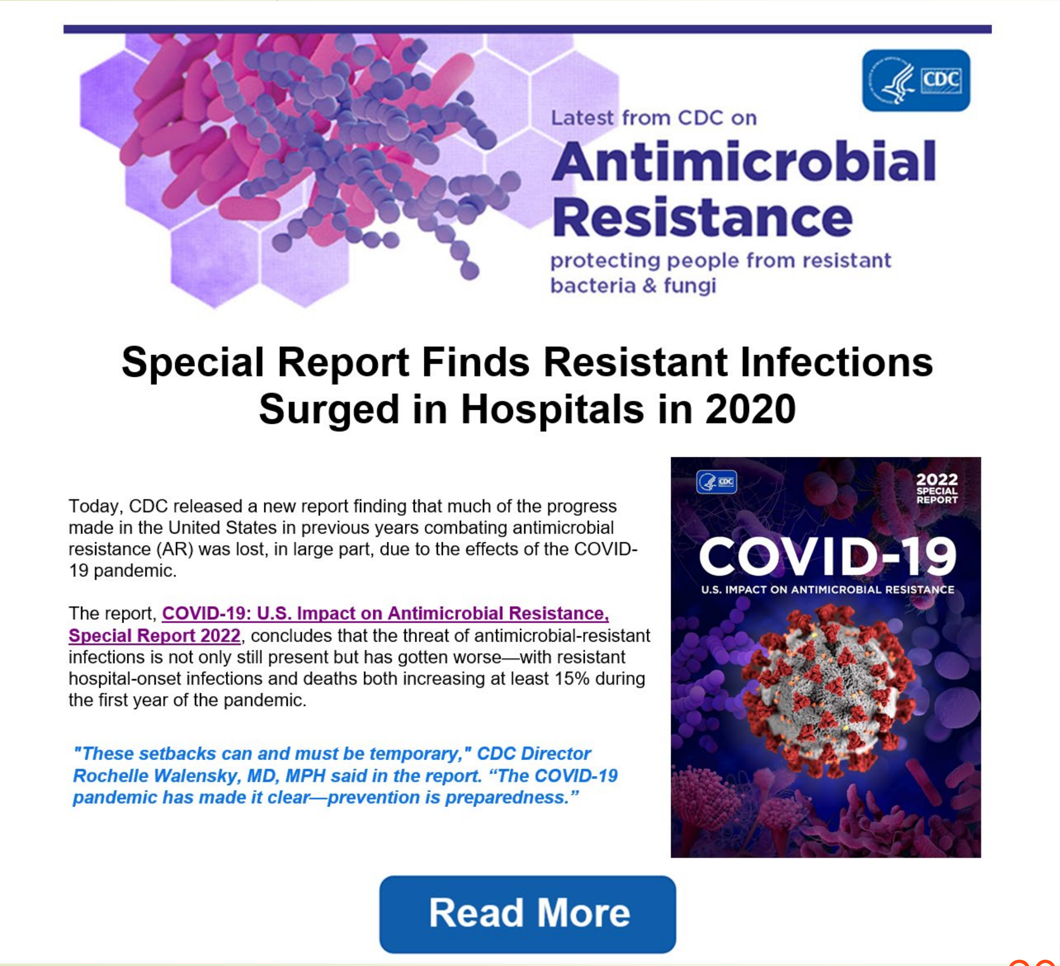
- Requiring urgent and aggressive action



Serious


DRUG-RESISTANT
CAMPYLOBACTER
DRUG-RESISTANT
CANDIDA
ESBL-PRODUCING
ENTEROBACTERIACEAE
VANCOMYCIN-RESISTANT
ENTEROCOCCI
MULTIDRUG-RESISTANT
PSEUDOMONAS AERUGINOSA
DRUG-RESISTANT
NONTYPHOIDAL SALMONELLA
DRUG-RESISTANT
NONTYPHOIDAL SALMONELLA
DRUG-RESISTANT
SALMONELLA SEROTYPE TYPHI
DRUG-RESISTANT
SHIGELLA
METHICILLIN-RESISTANT
STAPHYLOCOCCUS AUREUS
DRUG-RESISTANT
STREPTOCOCCUS PNEUMONIAE
DRUG-RESISTANT
TUBERCULOSIS

Current State



Latest from CDC on

Antimicrobial Resistance

protecting people from resistant bacteria & fungi

Special Report Finds Resistant Infections Surged in Hospitals in 2020

Today, CDC released a new report finding that much of the progress made in the United States in previous years combating antimicrobial resistance (AR) was lost, in large part, due to the effects of the COVID-19 pandemic.

The report, COVID-19: U.S. Impact on Antimicrobial Resistance, Special Report 2022, concludes that the threat of antimicrobial-resistant infections is not only still present but has gotten worse—with resistant hospital-onset infections and deaths both increasing at least 15% during the first year of the pandemic.

"These setbacks can and must be temporary," CDC Director Rochelle Walensky, MD, MPH said in the report. "The COVID-19 pandemic has made it clear—prevention is preparedness."

Read More

- During the first year of the pandemic, more than **29,400 people died** from antimicrobial-resistant infections commonly associated with healthcare. Of these, nearly **40% of the people got the infection while they were in the hospital.**
- Resistant hospital-onset infections and deaths both increased at least 15% from 2019 to 2020 among seven pathogens.
- Antifungal-resistant threats rose in 2020, too, including ***Candida auris***—which **increased 60%** overall—and Candida species (excluding *Candida auris*), with a 26% increase in infections in hospitals.

2022 SPECIAL REPORT: COVID-19 U.S. Impact on Antimicrobial Resistance (cdc.gov)

Antibiotic Use in 2020

Hospitals

- From March 2020 to October 2020, almost 80% of patients hospitalized with COVID-19 received an antibiotic.[13]
- Antibiotic use was lower overall as of August 2021 compared to 2019 but increased for some antibiotics like azithromycin and ceftriaxone. Approximately half of hospitalized patients received ceftriaxone, which was commonly prescribed with azithromycin.
- This likely reflects difficulties in distinguishing COVID-19 from community-acquired pneumonia when patients first arrive at a hospital for assessment.

Outpatient Settings

- Antibiotic use significantly dropped in 2020 compared to 2019 due to less use of outpatient health care and less spread of other respiratory illnesses that often lead to antibiotic prescribing.
- However, in 2021 outpatient antibiotic use rebounded. While antibiotic use was lower overall in 2021 compared with 2019, in August 2021, antibiotic use exceeded prescribing in 2019 by 3%.
- From 2020 through December 2021, most antibiotic prescriptions for adults were for azithromycin and increases in azithromycin prescribing corresponded to peaks in cases of COVID-19. After an initial peak in azithromycin prescribing in March 2020, azithromycin use decreased during the pandemic.
- By August 2021, there was still more azithromycin prescribing than in August 2019.

2022

CDC

Special Report

COVID-19 Impacts on

18 Antimicrobial-Resistant Bacteria and Fungi

Threat Estimates

The following table summarizes the latest national death and infection estimates for 18 antimicrobial-resistant bacteria and fungi. The pathogens are listed in three categories—urgent, serious, and concerning—based on level of concern to human health identified in 2019.

	Resistant Pathogen	2017 Threat Estimate	2018 Threat Estimate	2019 Threat Estimate	2017-2019 Change	2020 Threat Estimate and 2019-2020 Change
URGENT	Carbapenem-resistant *Acinetobacter*	8,500 cases 700 deaths	6,300 cases 500 deaths	6,000 cases 500 deaths	Stable*	7,500 cases 700 deaths **Overall: 35% increase*** **Hospital-onset: 78% increase***
URGENT	Antifungal-resistant *Candida auris*	171 clinical cases†	329 clinical cases	466 clinical cases	Increase	754 cases **Overall: 60% increase**
URGENT	*Clostridioides difficile*	223,900 infections 12,800 deaths	221,200 infections 12,600 deaths	202,600 infections 11,500 deaths	Decrease	Data delayed due to COVID-19 pandemic
URGENT	Carbapenem-resistant Enterobacterales	13,100 cases 1,100 deaths	10,300 cases 900 deaths	11,900 cases 1,000 deaths	Decrease*	12,700 cases 1,100 deaths Overall: Stable* **Hospital-onset: 35% increase***
URGENT	Drug-resistant *Neisseria gonorrhoeae*	550,000 infections	804,000 infections	942,000 infections	Increase	Data unavailable due to COVID-19 pandemic
SERIOUS	Drug-resistant *Campylobacter*	448,400 infections 70 deaths	630,810 infections	725,210 infections	Increase	Data delayed due to COVID-19 pandemic‡ 26% of infections were resistant, a 10% decrease
SERIOUS	Antifungal-resistant *Candida*	34,800 cases 1,700 deaths	27,000 cases 1,300 deaths	26,600 cases 1,300 deaths	Decrease*	28,100 cases 1,400 deaths **Overall: 12% increase*** **Hospital-onset: 26% increase***
SERIOUS	ESBL-producing Enterobacterales	197,400 cases 9,100 deaths	174,100 cases 8,100 deaths	194,400 cases 9,000 deaths	Increase*	197,500 cases 9,300 deaths **Overall: 10% increase*** **Hospital-onset: 32% increase***
SERIOUS	Vancomycin-resistant Enterococcus	54,500 cases 5,400 deaths	46,800 cases 4,700 deaths	47,000 cases 4,700 deaths	Stable*	50,300 cases 5,000 deaths **Overall: 16% increase*** **Hospital-onset: 14% increase***

	Resistant Pathogen	2017 Threat Estimate	2018 Threat Estimate	2019 Threat Estimate	2017-2019 Change	2020 Threat Estimate and 2019-2020 Change
SERIOUS	Multidrug-resistant *Pseudomonas aeruginosa*	32,600 cases 2,700 deaths	29,500 cases 2,500 deaths	28,200 cases 2,400 deaths	Decrease*	28,800 cases 2,500 deaths Overall: Stable* **Hospital-onset: 32% increase***
SERIOUS	Drug-resistant nontyphoidal *Salmonella*	212,500 infections 70 deaths	228,290 infections	254,810 infections	Increase	Data delayed due to COVID-19 pandemic‡ 14% of infections were resistant, a 3% decrease
SERIOUS	Drug-resistant *Salmonella* serotype Typhi	4,100 infections <5 deaths	4,640 infections	6,130 infections	Increase	Data delayed due to COVID-19 pandemic‡ 85% of infections were resistant, a 10% increase
SERIOUS	Drug-resistant *Shigella*	77,000 infections <5 deaths	215,850 infections	242,020 infections	Increase	Data delayed due to COVID-19 pandemic‡ 46% of infections were resistant, a 2% increase
SERIOUS	Methicillin-resistant *Staphylococcus aureus*	323,700 cases 10,600 deaths	298,700 cases 10,000 deaths	306,600 cases 10,200 deaths	Stable*	279,300 cases 9,800 deaths Overall: Stable* **Hospital-onset: 13% increase***
SERIOUS	Drug-resistant *Streptococcus pneumoniae*	12,100 invasive infections 1,500 deaths†	See pathogen page if comparing data over time	12,000 invasive infections 1,200 deaths	Stable	Data delayed due to COVID-19 pandemic
SERIOUS	Drug-resistant Tuberculosis (TB)	888 cases 73 deaths†	962 cases 102 deaths	919 cases	Stable	661 cases Decrease‡
CONCERNING	Erythromycin-resistant group A *Streptococcus*	5,400 infections 450 deaths†	See pathogen page if comparing data over time	6,200 infections 560 deaths	Increase	Data delayed due to COVID-19 pandemic
CONCERNING	Clindamycin-resistant group B *Streptococcus*	13,000 infections 720 deaths†	See pathogen page if comparing data over time	15,300 cases 940 deaths	Increase	Data delayed due to COVID-19 pandemic

Contributing Factors to AR in HC Settings

- Challenges in identification
- Under detection
  - Asymptomatic colonization
- Gaps in IC practices
- Patient Sharing
  - Facilities
  - Equipment
- Colonization of sinks, drains and plumbing
  - Splash zone contamination

Strategies

Antibiotic Stewardship

- “**Antimicrobial stewardship** is a coordinated program that promotes the appropriate use of antimicrobials (including antibiotics), improves patient outcomes, reduces microbial resistance, and decreases the spread of infections caused by multidrug-resistant organisms”. *APIC*

- “**Antibiotic stewardship** is the effort to measure and improve how antibiotics are prescribed by clinicians and used by patients. Improving antibiotic prescribing and use is critical to effectively treat infections, protect patients from harms caused by unnecessary antibiotic use, and combat antibiotic resistance”. *CDC*

- "**Antimicrobial stewardship** refers to the actions veterinarians take individually and as a profession to preserve the effectiveness and availability of antimicrobial drugs through conscientious oversight and responsible medical decision-making while safeguarding animal, public, and environmental health”. *AVMA*

ABS - Core Elements

Core Elements of Hospital Antibiotic Stewardship Programs

Hospital Leadership Commitment
Dedicate necessary human, financial, and information technology resources.

Accountability
Appoint a leader or co-leaders, such as a physician and pharmacist, responsible for program management and outcomes.

Pharmacy Expertise (previously "Drug Expertise"):
Appoint a pharmacist, ideally as the co-leader of the stewardship program, to help lead implementation efforts to improve antibiotic use.

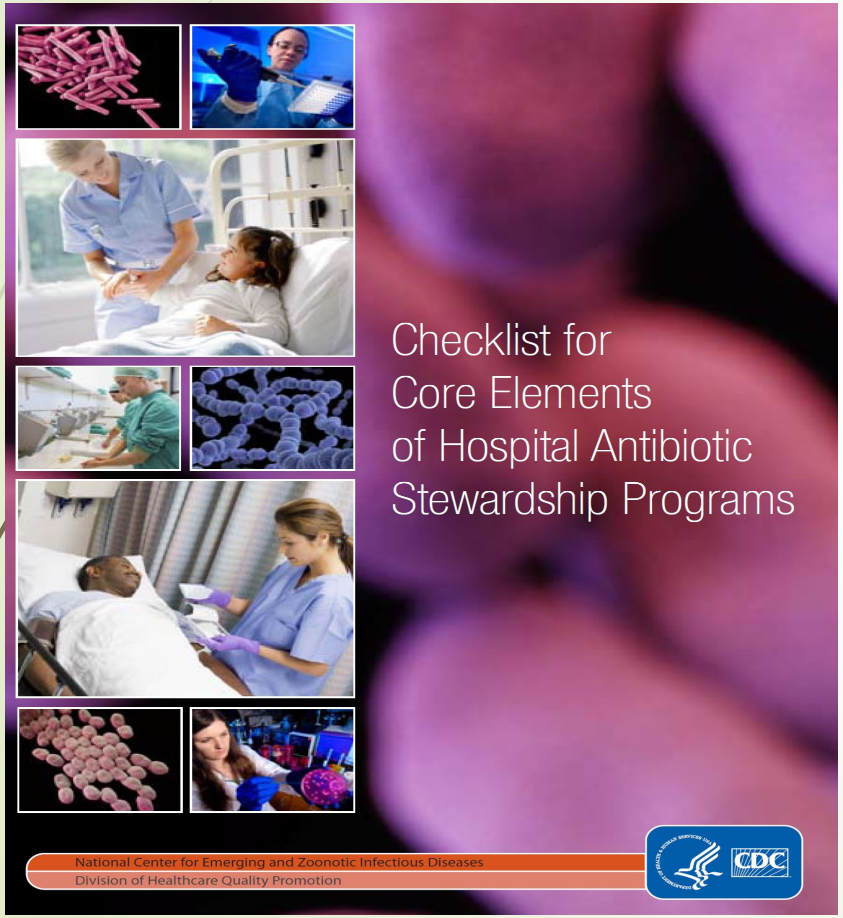
Action
Implement interventions, such as prospective audit and feedback or preauthorization, to improve antibiotic use.

Tracking
Monitor antibiotic prescribing, impact of interventions, and other important outcomes, like *C. difficile* infections and resistance patterns.

Reporting
Regularly report information on antibiotic use and resistance to prescribers, pharmacists, nurses, and hospital leadership.

Education
Educate prescribers, pharmacists, nurses, and patients about adverse reactions from antibiotics, antibiotic resistance, and optimal prescribing.

Assessment



Checklist for Core Elements of Hospital Antibiotic Stewardship Programs

The following checklist is a companion to *Core Elements of Hospital Antibiotic Stewardship Programs*. This checklist should be used to systematically assess key elements and actions to ensure optimal antibiotic prescribing and limit overuse and misuse of antibiotics in hospitals. CDC recommends that all hospitals implement an Antibiotic Stewardship Program.

Facilities using this checklist should involve one or more knowledgeable staff to determine if the following principles and actions to improve antibiotic use are in place. The elements in this checklist have been shown in previous studies to be helpful in improving antibiotic use though not all of the elements might be feasible in all hospitals.

LEADERSHIP SUPPORT	ESTABLISHED AT FACILITY	
A. Does your facility have a formal, written statement of support from leadership that supports efforts to improve antibiotic use (antibiotic stewardship)?	❑ Yes	❑ No
B. Does your facility receive any budgeted financial support for antibiotic stewardship activities (e.g., support for salary, training, or IT support)?	❑ Yes	❑ No
ACCOUNTABILITY		
A. Is there a physician leader responsible for program outcomes of stewardship activities at your facility?	❑ Yes	❑ No
DRUG EXPERTISE		
A. Is there a pharmacist leader responsible for working to improve antibiotic use at your facility?	❑ Yes	❑ No
KEY SUPPORT FOR THE ANTIBIOTIC STEWARDSHIP PROGRAM *Does any of the staff below work with the stewardship leaders to improve antibiotic use?*		
B. Clinicians	❑ Yes	❑ No
C. Infection Prevention and Healthcare Epidemiology	❑ Yes	❑ No
D. Quality Improvement	❑ Yes	❑ No
E. Microbiology (Laboratory)	❑ Yes	❑ No
F. Information Technology (IT)	❑ Yes	❑ No
G. Nursing	❑ Yes	❑ No

Professional Guidelines

Clinical Infectious Diseases

IDSA GUIDELINE

IDSA Infectious Diseases Society of America

hivma hiv medicine association

OXFORD

Implementing an Antibiotic Stewardship Program: Guidelines by the Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America

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Evidence-based guidelines for implementation and measurement of antibiotic stewardship interventions in inpatient populations including long-term care were prepared by a multidisciplinary expert panel of the Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America. The panel included clinicians and investigators representing internal medicine, emergency medicine, microbiology, critical care, surgery, epidemiology, pharmacy, and adult and pediatric infectious diseases specialties. These recommendations address the best approaches for antibiotic stewardship programs to influence the optimal use of antibiotics.

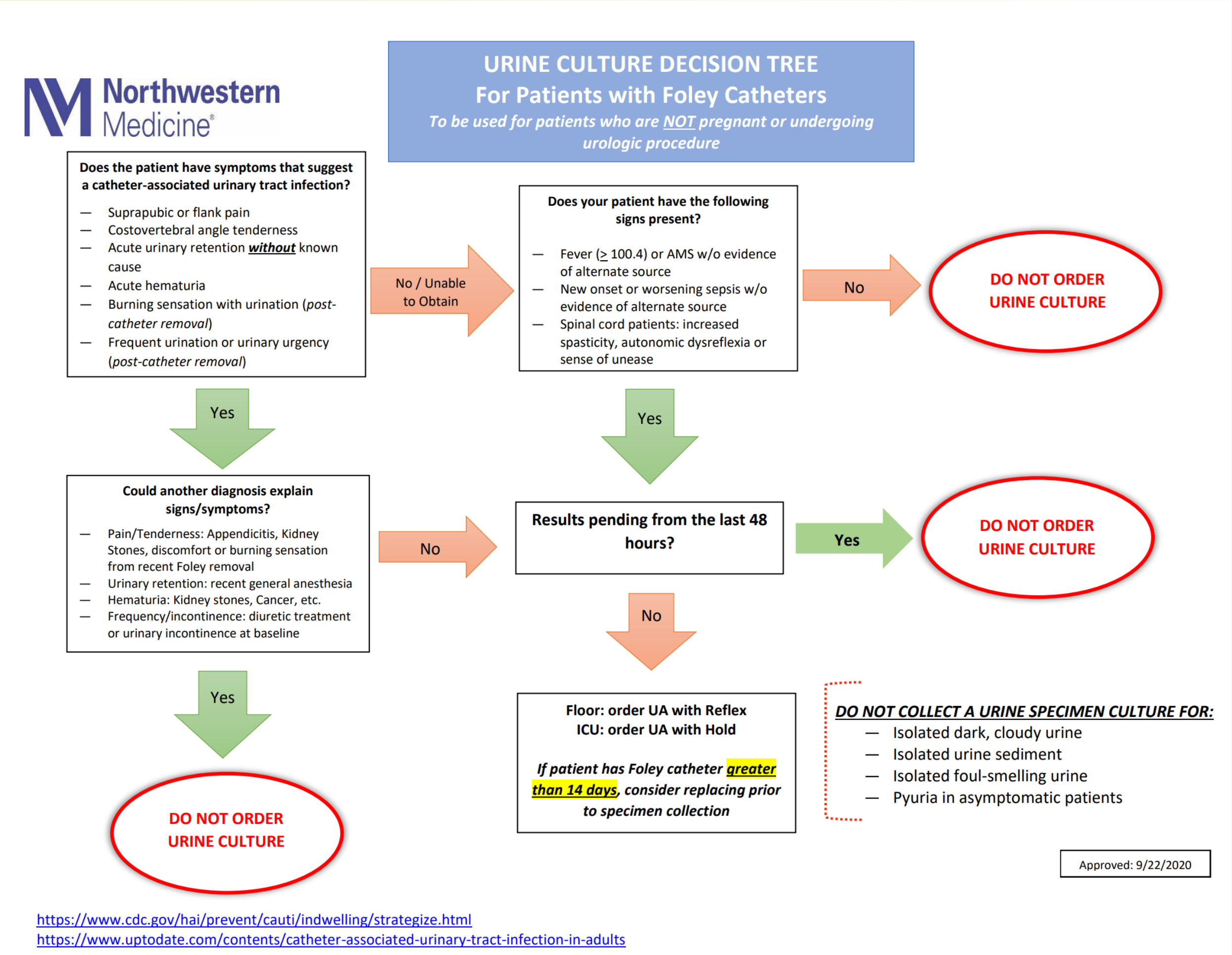
Keywords. antibiotic stewardship; antibiotic stewardship programs; antibiotics; implementation.

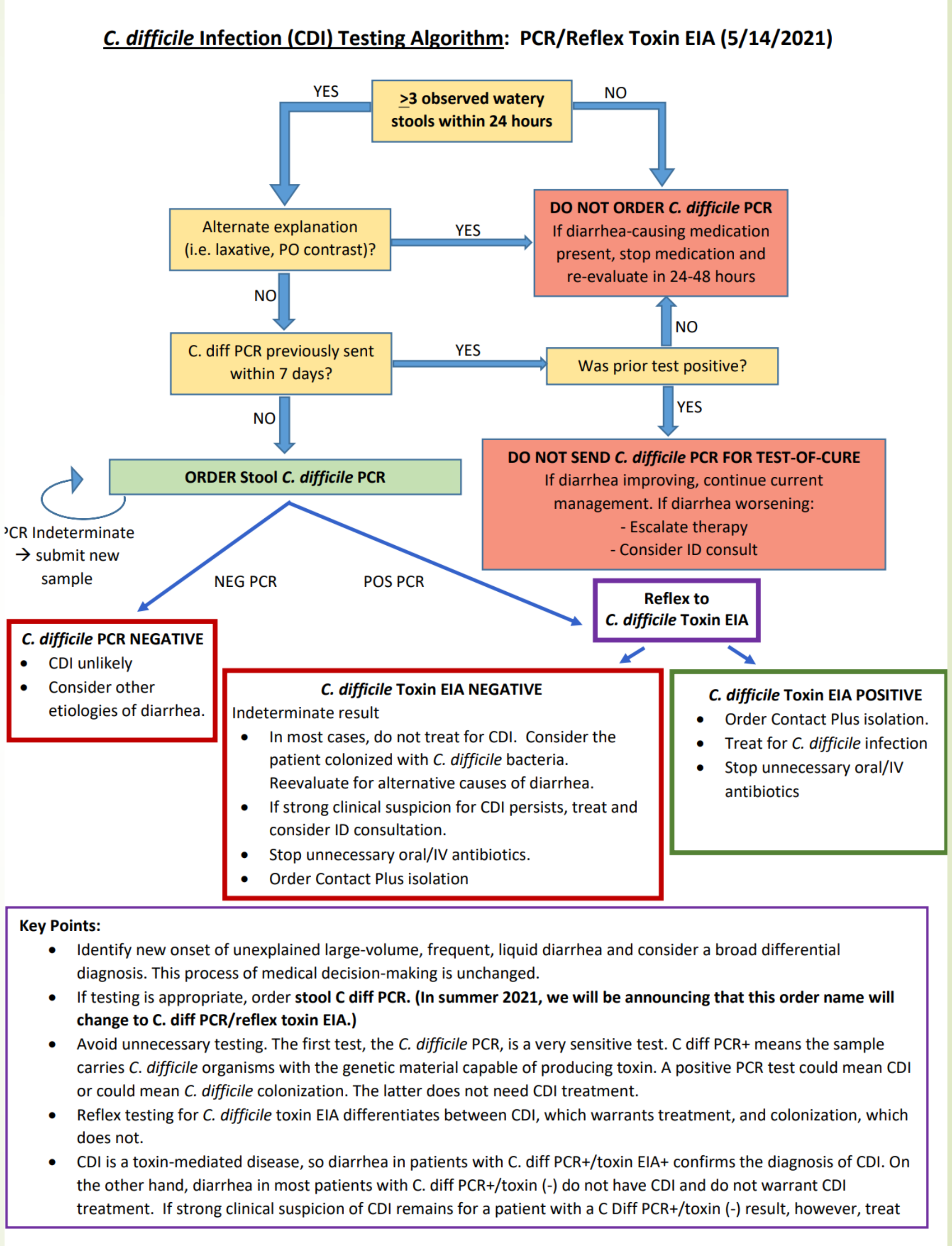
Diagnostic Stewardship

- Diagnostic stewardship aims to deliver the right test to the right patient at the right time and is optimally combined with antimicrobial stewardship to allow for the right interpretation to translate into the right antimicrobial at the right time.

- Hueth KD, Prinzi AM, Timbrook TT. Diagnostic Stewardship as a Team Sport: Interdisciplinary Perspectives on Improved Implementation of Interventions and Effect Measurement. Antibiotics (Basel). 2022 Feb 15;11(2):250. doi: 10.3390/antibiotics11020250. PMID: 35203852; PMCID: PMC8868553.

Example


Northwestern Medicine®
URINE CULTURE DECISION TREE
For Patients with Foley Catheters
To be used for patients who are NOT pregnant or undergoing urologic procedure
Does the patient have symptoms that suggest a catheter-associated urinary tract infection?
— Suprapubic or flank pain
— Costovertebral angle tenderness
— Acute urinary retention without known cause
— Acute hematuria
— Burning sensation with urination (post-catheter removal)
— Frequent urination or urinary urgency (post-catheter removal)
No / Unable to Obtain
Does your patient have the following signs present?
— Fever (≥ 100.4) or AMS w/o evidence of alternate source
— New onset or worsening sepsis w/o evidence of alternate source
— Spinal cord patients: increased spasticity, autonomic dysreflexia or sense of unease
No
DO NOT ORDER URINE CULTURE
Yes
Yes
Could another diagnosis explain signs/symptoms?
— Pain/Tenderness: Appendicitis, Kidney Stones, discomfort or burning sensation from recent Foley removal
— Urinary retention: recent general anesthesia
— Hematuria: Kidney stones, Cancer, etc.
— Frequency/incontinence: diuretic treatment or urinary incontinence at baseline
No
Results pending from the last 48 hours?
Yes
DO NOT ORDER URINE CULTURE
Yes
No
DO NOT ORDER URINE CULTURE
Floor: order UA with Reflex
ICU: order UA with Hold
If patient has Foley catheter greater than 14 days, consider replacing prior to specimen collection
DO NOT COLLECT A URINE SPECIMEN CULTURE FOR:
— Isolated dark, cloudy urine
— Isolated urine sediment
— Isolated foul-smelling urine
— Pyuria in asymptomatic patients
Approved: 9/22/2020
https://www.cdc.gov/hai/prevent/cauti/indwelling/strategize.html
https://www.uptodate.com/contents/catheter-associated-urinary-tract-infection-in-adults


C. difficile Infection (CDI) Testing Algorithm: PCR/Reflex Toxin EIA (5/14/2021)
YES
≥3 observed watery stools within 24 hours
NO
Alternate explanation (i.e. laxative, PO contrast)?
YES
DO NOT ORDER C. difficile PCR
If diarrhea-causing medication present, stop medication and re-evaluate in 24-48 hours
NO
C. diff PCR previously sent within 7 days?
YES
Was prior test positive?
NO
YES
NO
ORDER Stool C. difficile PCR
DO NOT SEND C. difficile PCR FOR TEST-OF-CURE
If diarrhea improving, continue current management. If diarrhea worsening:
- Escalate therapy
- Consider ID consult
PCR Indeterminate → submit new sample
NEG PCR
POS PCR
Reflex to C. difficile Toxin EIA
C. difficile PCR NEGATIVE
• CDI unlikely
• Consider other etiologies of diarrhea.
C. difficile Toxin EIA NEGATIVE
Indeterminate result
• In most cases, do not treat for CDI. Consider the patient colonized with C. difficile bacteria. Reevaluate for alternative causes of diarrhea.
• If strong clinical suspicion for CDI persists, treat and consider ID consultation.
• Stop unnecessary oral/IV antibiotics.
• Order Contact Plus isolation
C. difficile Toxin EIA POSITIVE
• Order Contact Plus isolation.
• Treat for C. difficile infection
• Stop unnecessary oral/IV antibiotics
Key Points:
• Identify new onset of unexplained large-volume, frequent, liquid diarrhea and consider a broad differential diagnosis. This process of medical decision-making is unchanged.
• If testing is appropriate, order stool C diff PCR. (In summer 2021, we will be announcing that this order name will change to C. diff PCR/reflex toxin EIA.)
• Avoid unnecessary testing. The first test, the C. difficile PCR, is a very sensitive test. C diff PCR+ means the sample carries C. difficile organisms with the genetic material capable of producing toxin. A positive PCR test could mean CDI or could mean C. difficile colonization. The latter does not need CDI treatment.
• Reflex testing for C. difficile toxin EIA differentiates between CDI, which warrants treatment, and colonization, which does not.
• CDI is a toxin-mediated disease, so diarrhea in patients with C. diff PCR+/toxin EIA+ confirms the diagnosis of CDI. On the other hand, diarrhea in most patients with C. diff PCR+/toxin (-) do not have CDI and do not warrant CDI treatment. If strong clinical suspicion of CDI remains for a patient with a C Diff PCR+/toxin (-) result, however, treat

Antimicrobial Stewardship: A Collaborative Partnership between Infection Preventionists and Healthcare Epidemiologists

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Misuse and overuse of antimicrobials, primarily involving therapeutic agents used to treat infection in humans, is considered one of the world's most pressing public health problems.[1] Not only does such inappropriate use diminish the therapeutic benefit of essential medications, it also facilitates the development and spread of multidrug-resistant organisms (MDROs).[2] Antimicrobial resistance and the rise in MDROs globally are associated with increased morbidity and mortality, cross-transmission within and between healthcare settings, and increased consumption of limited patient-care re-

This position paper highlights the critical importance of healthcare epidemiologists (HEs) and infection preventionists (IPs) in effective antimicrobial stewardship programs (ASPs). The skills and knowledge each of these highly skilled professionals brings to a facility's ASP, when combined with other disciplines, can accelerate progress toward preventing emergence and cross-transmission of MDROs (Table 1). The Association for Professionals in Infection Control and Epidemiology (APIC) and the Society for Healthcare Epidemiology (SHEA) are the professional organizations with historical fo-

SHEA (April 2012 Vol.33 No. 4)

Role of The IP

- Prevention Advocates
  - Hand Hygiene
  - Oversight of transmission-based precautions in the prevention of pathogens
  - Appropriate and effective environmental cleaning and disinfection
  - Diagnostic stewardship
  - Implementation of HAI prevention strategies

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American Journal of Infection Control

journal homepage: www.ajicjournal.org

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AJIC American Journal of Infection Control

Brief Report

Infection preventionists role in antimicrobial stewardship: Survey of APIC members

Check for updates

Monika Pogorzelska-Maziarz PhD, MPH, CIC, FAPIC [a,*], Eileen J. Carter PhD, RN [b,c], Elizabeth Monsees PhD, MBA, RN, CIC, FAPIC [d], Mary Lou Manning PhD, CRNP, CIC, FAPIC, FAAN [a]

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IPC Program Activities

- Surveillance
  - Identifying emerging and known (endemic) MDROs among population served
  - Timely identification of emerging resistance patterns
  - Using antimicrobial resistance data to identify priority areas for antimicrobial management
  - Data collection, analysis, and reporting of HAI
  - Auditing
  - Use of surveillance data to inform risk assessment and IPC Planning

Communication

- Movement of patients between services, locations and facilities can increase risk for transmission.

Inter-facility Infection Control Transfer Form

This form must be filled out for transfer to accepting facility with information communicated prior to or with transfer.

Please attach copies of latest culture reports with susceptibilities if available.

Sending Healthcare Facility:

Patient/Resident Last Name	First Name	Date of Birth	Medical Record Number

Name/Address of Sending Facility	Sending Unit	Sending Facility Phone

Sending Facility Contacts	Contact Name	Phone	E-mail
Transferring RN/Unit			
Transferring physician			
Case Manager/Admin/SW			
Infection Preventionist			

Does the person* currently have an infection, colonization OR a history of positive culture of a multidrug-resistant organism (MDRO) or other potentially transmissible infectious organism?	Colonization or history (*Check if YES*)	Active infection on Treatment (*Check if YES*)
Methicillin-resistant *Staphylococcus aureus* (MRSA)	Yes	Yes
Vancomycin-resistant *Enterococcus* (VRE)	Yes	Yes
Clostridioides difficile	Yes	Yes
Acinetobacter, multidrug-resistant	Yes	Yes
Enterobacteriaceae (e.g., *E. coli, Klebsiella, Proteus*) producing-Extended Spectrum Beta-Lactamase (ESBL)	Yes	Yes
Carbapenem-resistant Enterobacteriaceae (CRE)	Yes	Yes
Pseudomonas aeruginosa, multidrug-resistant	Yes	Yes
Candida auris	Yes	Yes
Other, specify (e.g., lice, scabies, norovirus, influenza):	Yes	Yes

Does the person* currently have any of the following? (Check here if none apply)

- Cough or requires suctioning
- Diarrhea
- Vomiting
- Incontinent of urine or stool
- Open wounds or wounds requiring dressing change
- Drainage (source):
- Central line/PICC (Approx. date inserted)
- Hemodialysis catheter
- Urinary catheter (Approx. date inserted)
- Suprapubic catheter
- Percutaneous gastrostomy tube
- Tracheostomy

Inter-facility Infection Control Transfer Form

Is the person* currently in Transmission-Based Precautions? NO YES

Type of Precautions (check all that apply) Contact Droplet Airborne

Other:

Reason for Precautions:

Is the person* currently on antibiotics? NO YES (current use)

Antibiotic, dose, route, freq.	Treatment for:	Start date	Anticipated stop date	Date/time last dose

Vaccine	Date administered (If known)	Lot and Brand (If known)	Year administered (If exact date not known)	Does the person* self-report receiving vaccine?
Influenza (seasonal)				Yes No
Pneumococcal (PPSV23)				Yes No
Pneumococcal (PCV13)				Yes No
Other:				Yes No

*Refers to patient or resident depending on transferring facility

Name of staff completing form (print):

Signature: **Date :**

If information communicated prior to transfer:

Name of individual at receiving facility:

Phone of individual at receiving facility:

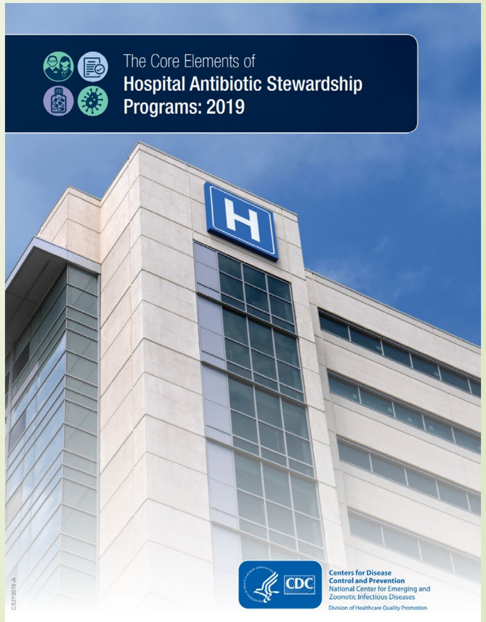
SAVE PRINT

Recruiting Champions

CDC Core Elements of Hospital Antibiotic Stewardship

“Nurses can play an especially important role in stewardship”

- Optimizing testing decisions about whether or not a patient has symptoms that might justify a urine culture.
- Assuring that cultures are performed correctly before starting antibiotics.
- Prompting discussions of antibiotic treatment, indication, and duration.
- Improving the evaluation of penicillin allergies.



Nurses and Antimicrobial Stewardship

Three practices were perceived most favorably:

- questioning the necessity of urinary cultures,
- ensuring proper culturing techniques,
- and encouraging the prompt transition from IV to PO antibiotics.

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AJIC American Journal of Infection Control

Major Article

Exploring the nurses' role in antibiotic stewardship: A multisite qualitative study of nurses and infection preventionists

CrossMark

Eileen J. Carter PhD, RN [a,b,*], William G. Greendyke MD [c,d], E. Yoko Furuya MD, MS [c,d], Arjun Srinivasan MD, FSHEA [e], Alexa N. Shelley MS, FNP-BC [a,b], Aditi Bothra BS, CHES [f], Lisa Saiman MD, MPH [c,g], Elaine L. Larson PhD, RN, FAAN, CIC [a,f]

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Practical Strategies

Role in ensuring

- appropriate C. difficile testing
- appropriate indications before obtaining urine specimens
- optimal antibiotic administration
- collecting and documenting accurate penicillin allergy histories
- Timeout promts

Key Elements needed:

- Education
- Communication
- Addressing barriers

- Perceived Barriers:
  - Increased workload
  - Lack of physician support
  - Limited knowledge
  - Lack of experience or knowledge
  - Nurses' input not valued

Monsees, E. (2019) Infection Control & Hospital Epidemiology, 40(5), 579-584.

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AJIC American Journal of Infection Control

Major Article

A novel framework to guide antibiotic stewardship nursing practice

Check for updates

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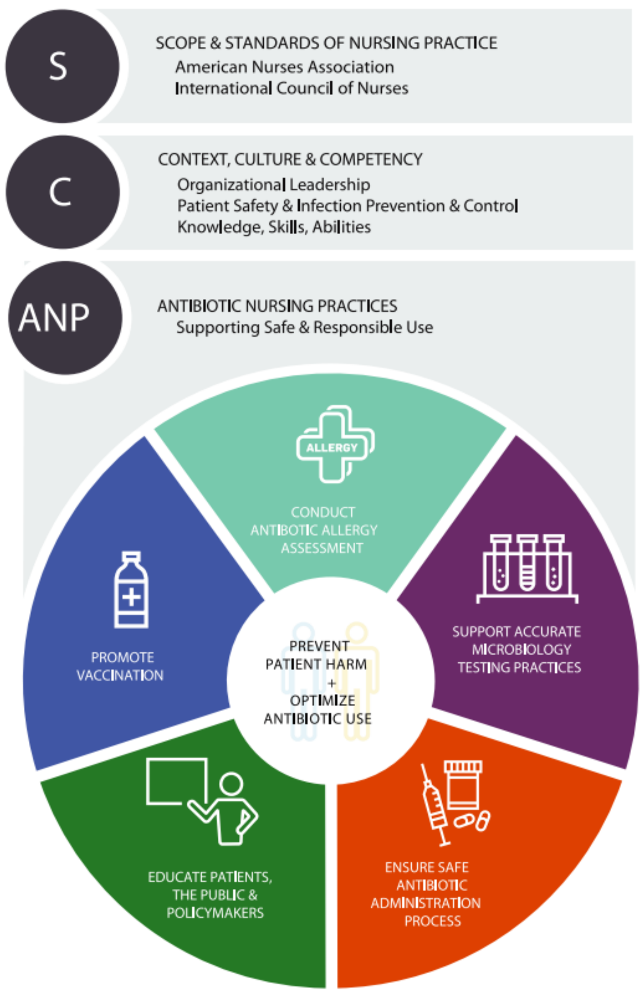

Fig 1. Antibiotic stewardship nursing practice SCAN-P framework.

Closing Thoughts

- Micro-organisms are adaptive to antibiotic pressure and have a number of defensive mechanisms
- The issue of antimicrobial resistance and related implications for health cannot be looked at in isolation
- Increasing focus on antimicrobial resistance
- The IP is an essential member the antimicrobial stewardship team and offers the *prevention* perspective

Thank You!

CNE: You will receive an email from me with information on how to get your credit.

Website: Nuggets of Knowledge

Next Session: October 13 at 1pm

Trends in HAI

THANK YOU!!