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California Department of Public Health

What Does an Infection Preventionist Need to Know About Antimicrobial and Diagnostic Stewardship?

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California APIC Coordinating Council
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Disclosures

- I have a deep and abiding appreciation for stewardship.
- I otherwise have no disclosures

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Learning Objectives

- Define antimicrobial stewardship and diagnostic stewardship; explain how these concepts are connected
- Explain the goals and activities of antimicrobial stewardship programs
- Discuss the relationship between infection prevention and antimicrobial stewardship
- Apply antimicrobial stewardship principles to infection prevention practice, with emphasis on urinary tract infection, *Clostridioides difficile* infection, and blood culture contamination.

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Antimicrobial Stewardship

Defined by the Centers for Disease Control and Prevention (CDC) as: The effort to measure and improve how antibiotics are prescribed by clinicians and used by patients

Antimicrobial stewardship aims to:

1. Optimize antimicrobial prescribing to best treat infections
2. Protect patients from adverse events caused by unnecessary antimicrobial use
3. Limit the emergence and spread of antimicrobial resistance

Core Elements of Antibiotic Stewardship| CDC (www.cdc.gov/antibiotic-use/hcp/core-elements/index.html)

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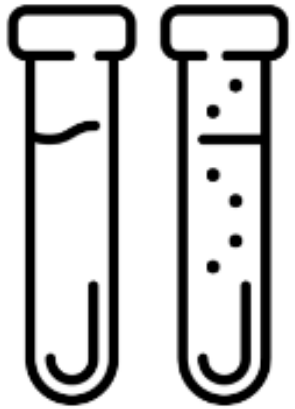
Diagnostic Stewardship

Defined by the CDC as: Improving how diagnostic tests are ordered, performed, and reported



Diagnostic stewardship aims to:

1. Minimize missed, delayed, and incorrect diagnoses
2. Reduce unnecessary testing

Core Elements of Hospital Diagnostic Excellence| CDC (www.cdc.gov/patient-safety/hcp/hospital-dx-excellence/index.html)

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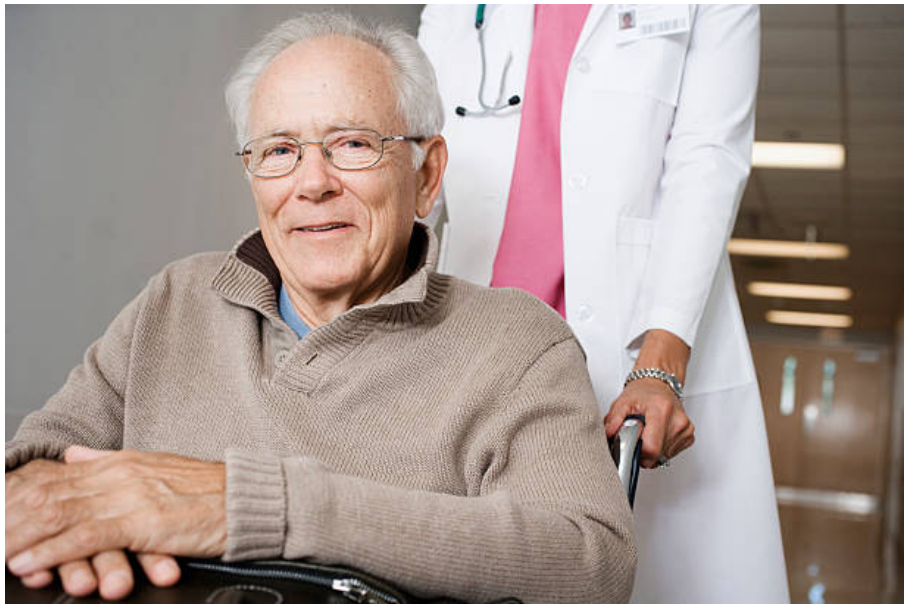
Example Case: Divergent Paths

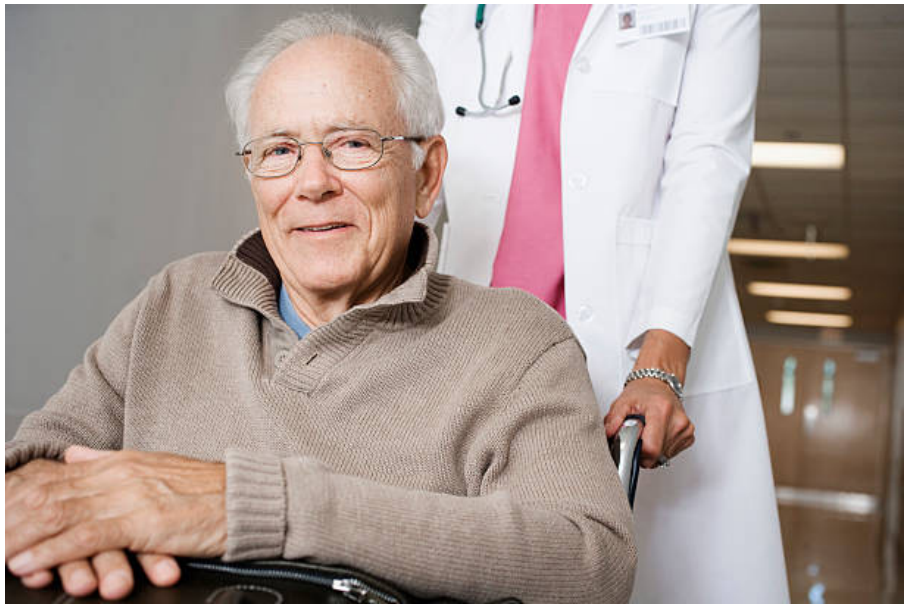
A Good Outcome

- An 84-year-old man is admitted to the hospital with new-onset heart failure
- On hospital day 3, he develops a fever, cough, and runny nose



A Good Outcome

- An 84-year-old man is admitted to the hospital with new-onset heart failure
- On hospital day 3, he develops a fever, cough, and runny nose
  - Respiratory testing is positive for respiratory syncytial virus (RSV)
  - He has no urinary symptoms; no urine testing is performed
  - No antibiotics are given



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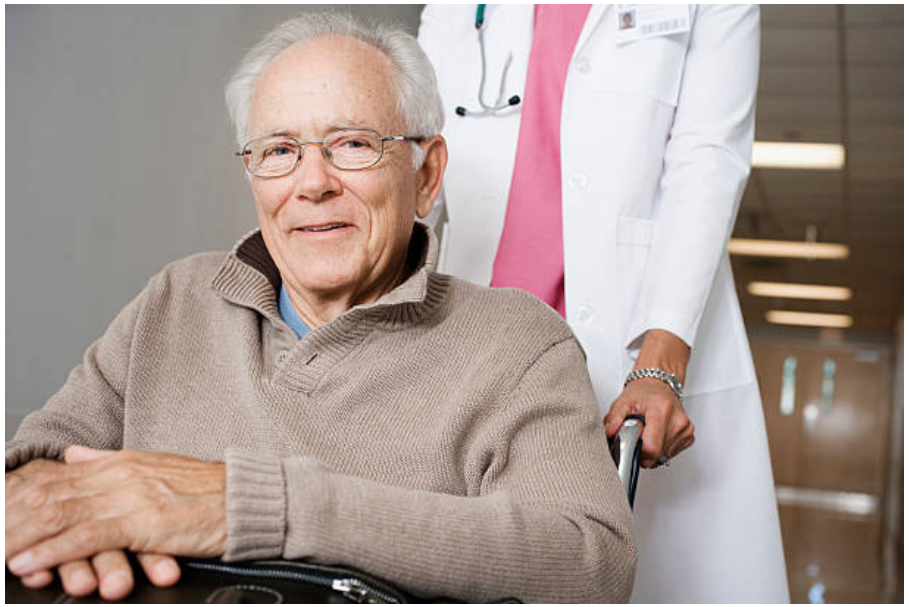
  - He has no urinary symptoms; no urine testing is performed
  - No antibiotics are given
- On hospital day 10, he is feeling well and is discharged home with his family



Through the Looking Glass: A Second Scenario

- On admission, a urinary catheter is placed for urine output monitoring
- On hospital day 3, he develops a new fever
  - The provider orders urine testing because it was preselected in the ‘fever’ order set, despite clear respiratory symptoms and lack of urinary symptoms
- Urinalysis shows 10 white blood cells per high-powered field (pyuria)
  - A urine culture later grows 50,000 colony forming units (CFU)/ml of *Escherichia coli* (bacteriuria)

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An Avoidable Outcome

- Based solely on pyuria, he is treated with levofloxacin and prescribed 14 days of therapy
  - Culture results show the organism is susceptible to more targeted and safer antibiotics like cefazolin

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  - Stool testing is positive for *Clostridioides difficile;* treatment is started

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  - Stool testing is positive for *Clostridioides difficile;* treatment is started
- On hospital day 12, he develops toxic megacolon and sepsis
  - Despite aggressive intensive care unit treatment, the patient develops a bowel perforation and passes away with his family at bedside

What Are Your Thoughts!

Where can we improve?

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Possible Responses

Avoidable negative patient outcomes

- Hospital-onset catheter-associated urinary tract infection (CAUTI)
  - Likely urinary colonization rather than true infection
- Hospital-onset *Clostridioides difficile* infection (*C. diff)*
  - Likely related to unnecessary antibiotic exposures
- Death

Stewardship-related opportunities for improvement

- Thoughtful consideration of urinary catheter use
- Appropriate urine testing and interpretation, especially in catheterized patients or patients without urinary symptoms
- Appropriate antibiotic selection and duration
- Optimizing therapy in response to culture results

Antibiotic Risks Are Not Just Hypothetical

- 92-year-old woman dies from *Clostridioides difficile* after receiving antibiotics following a dental procedure
  - Dentists still write millions of prescriptions a year for an antibiotic with life-threatening risks | CIDRAP (www.cidrap.umn.edu/antimicrobial-stewardship/dentists-still-write-millions-prescriptions-year-antibiotic-life)
- 17-year-old girl dies from a severe allergic drug reaction to an antibiotic given for acne
  - DRESS Syndrome is a rare but deadly reaction to prescription drugs - The Washington Post (www.washingtonpost.com/health/2024/07/27/fatal-drug-reaction-acne-dress/)
- 70-year-old woman dies from an infection resistant to all tested antibiotics
  - Bad bug, no drugs: The real end of antibiotics? - Harvard Health (www.health.harvard.edu/blog/bad-bug-no-drugs-real-end-antibiotics-2017022711103)

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Stewardship Aims to Improve Patient and Population Outcomes

- Reduce the emergence and spread of antimicrobial resistance
- Optimize patient outcomes (e.g., improve treatment success, reduce side effects, reduce *Clostridioides difficile* infections, reduce durations of hospitalization and therapy, reduce central lines, reduce expenses, etc.)

Sick Patient → Optimal Diagnostic Decisions → Optimal Treatment Decisions → Well Patient

“Diagnostic Stewardship” **“Antimicrobial Stewardship”**

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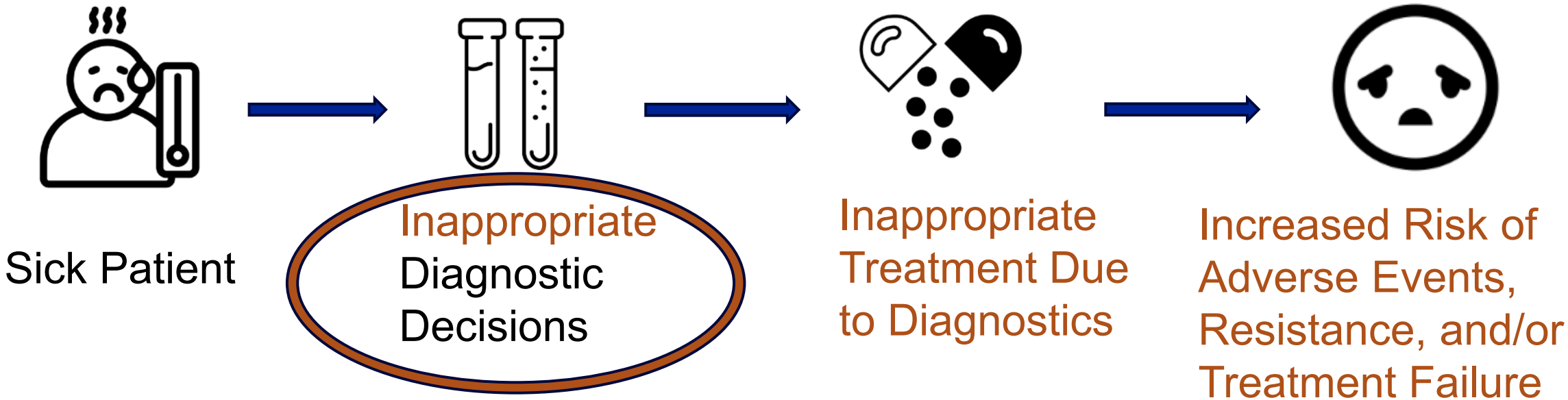
Inappropriate Diagnostic Decisions May Lead to Suboptimal Patient Outcomes

Diagnostic Stewardship Opportunity



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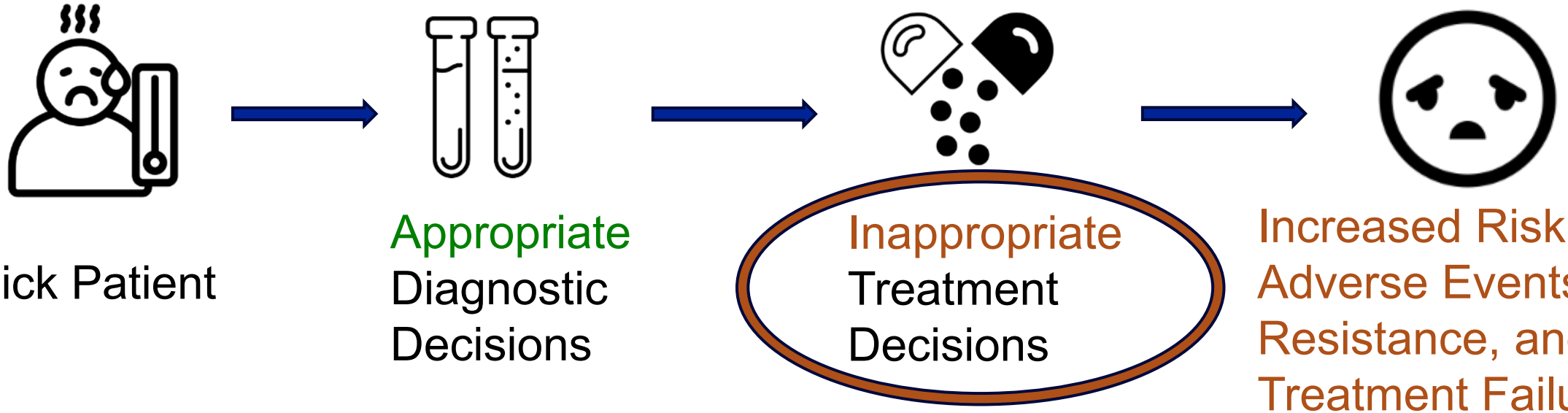
Inappropriate Treatment Decisions Also May Lead to Suboptimal Patient Outcomes

Antimicrobial Stewardship Opportunity



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Limiting Antimicrobial Resistance

A 10,000-foot view

Antimicrobial Resistance Is an Urgent Public Health Threat

- Globally, antimicrobial-resistant organisms kill at least 1.3 million people per year
- In the United States, each year resistant organisms:
  - Cause 2.8 million infections
  - Cause 35,000 deaths (48,000 when accounting for *C. diff*)
  - Cost 4.6 billion dollars to treat

Antimicrobial Resistance Facts and Stats | Antimicrobial Resistance | CDC
(www.cdc.gov/antimicrobial-resistance/data-research/facts-stats/index.html)

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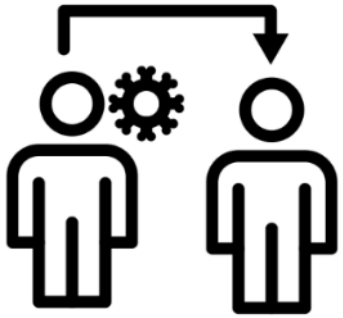
The Antimicrobial Resistance Spiral

Antimicrobial-Resistant Organism

Patient Spread



Patients Needing Antimicrobials

Treatment with Antimicrobials

Patients NOT Needing Antimicrobials

New Resistance

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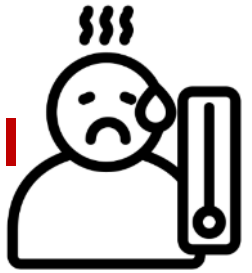
Infection Prevention Aims to Reduce Spread of Resistant Organisms

Antimicrobial-Resistant Organism

New Resistance

Patient Spread

Infection Prevention and Control



Patients Needing Antimicrobials

Treatment with Antimicrobials

Patients NOT Needing Antimicrobials

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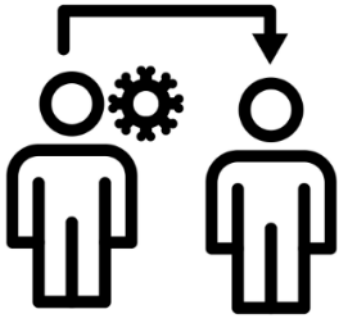
Antimicrobial Stewardship Aims to Limit Emergence of New Resistance

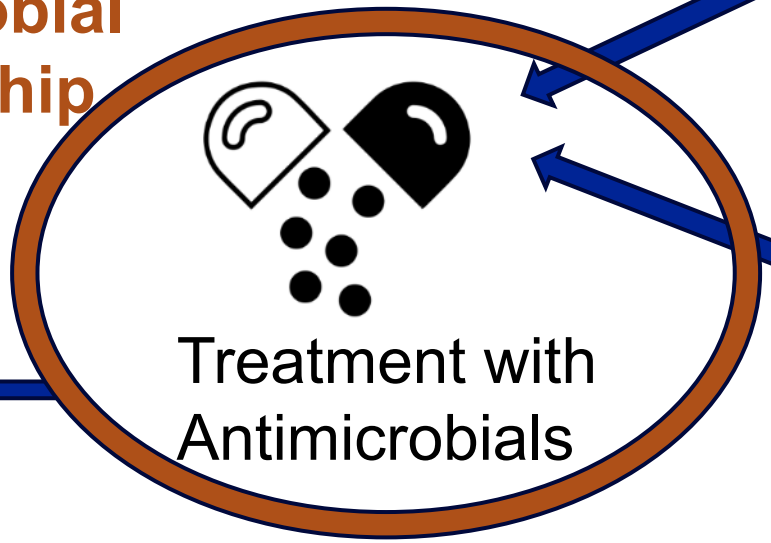
Patient Spread

Antimicrobial-Resistant Organism



Patients Needing Antimicrobials

Antimicrobial Stewardship



Treatment with Antimicrobials

Patients NOT Needing Antimicrobials

New Resistance

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Stewardship Programs Reduce Resistance!

- Meta-analysis of 32 studies (global)
- Stewardship programs reduced hospital-acquired infections and colonization with:
  - Multidrug-resistant gram-negative bacteria by 51% (95% confidence interval: 32-65%)
  - Extended-spectrum β-lactamase-producing gram-negative bacteria by 48% (CI: 2-73%)
  - Methicillin-resistant *Staphylococcus aureus* by 37% (CI: 12-55%)
- Stewardship also reduced hospital-acquired *Clostridioides difficile* infections by 32% (12-47%)

Baur et al. Effect of antibiotic stewardship on the incidence of infection and colonisation with antibiotic-resistant bacteria and Clostridium difficile infection: a systematic review and meta-analysis. 2017 | Lancet Infect. Dis. (https://pubmed.ncbi.nlm.nih.gov/28629876/)

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Why Else Should the Infection Preventionist Care: NHSN Reportable Diseases

- **Inappropriate diagnostic testing** → diagnosis and reporting of National Healthcare Safety Network-(NHSN) reportable diseases in patients without disease
  - Catheter-associated urinary tract infections
  - *Clostridioides difficile* infections
- **Inappropriate treatment** → true NHSN-reportable diseases
  - *Clostridioides difficile* infections
  - Selection and emergence of resistance organisms

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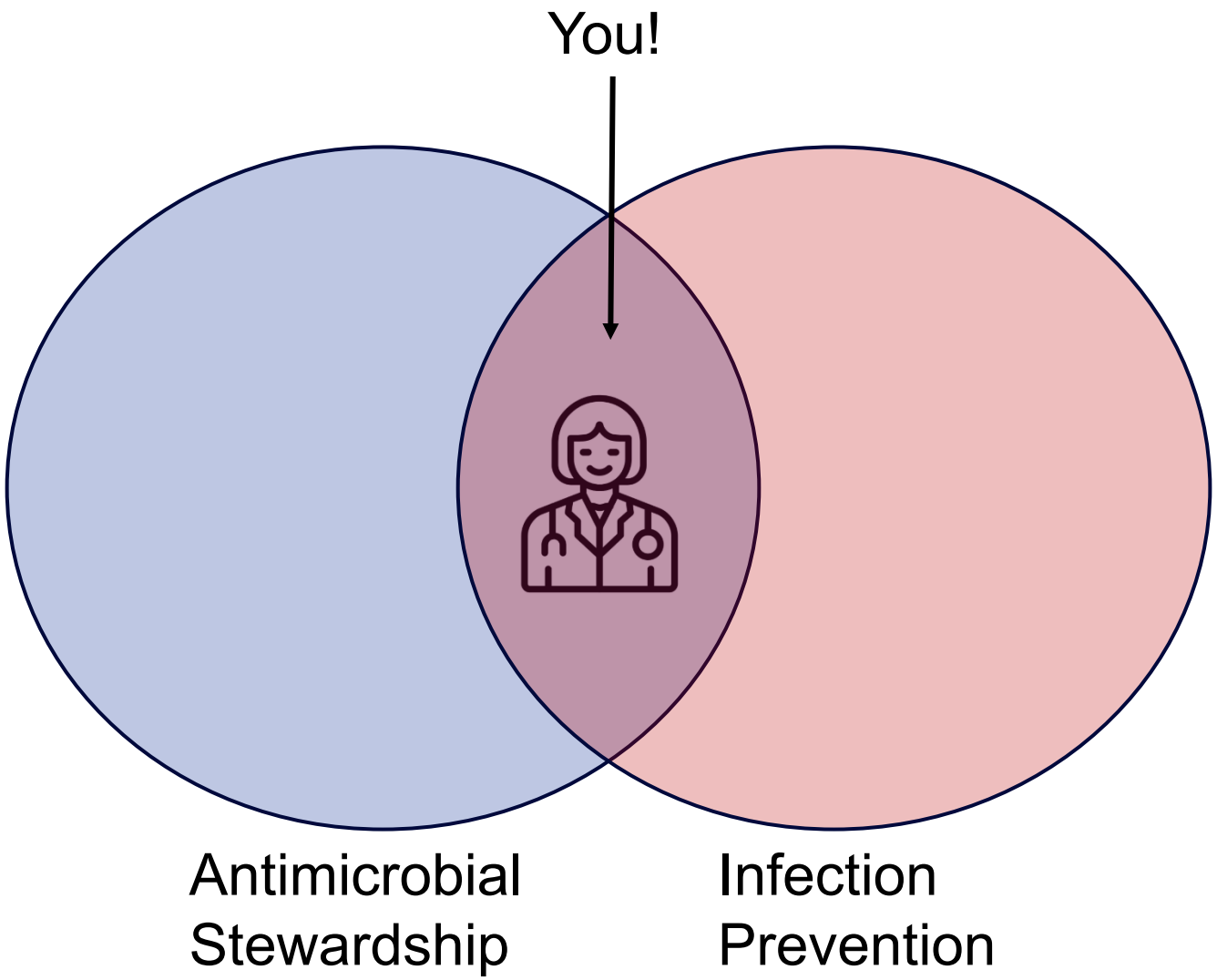
Antimicrobial Stewardship and Your Role



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Audience Question

How can you, as an infection preventionist, apply antimicrobial and diagnostic stewardship principles to improve patient care?

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You May be Asked to Do Stewardship Activities!

- Participate in antimicrobial stewardship teams and help create guidelines and monitor adherence
- Promote and monitor appropriate use of surgical antimicrobial prophylaxis
- Participate in root-cause analyses of hospital-associated infections (HAIs)
  - E.g., *Clostridioides difficile* infections, catheter-associated urinary tract infections, central line-associated blood stream infections
  - Provide recommendations to improve processes and reduce HAIs
- Improve communication about antimicrobial use during transfer of care (e.g., indication, planned duration, pending culture result)
- Advocate for antimicrobial stewardship programs to hospital leadership[1]

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Nuts and Bolts of Stewardship and the Role of IPs

Antimicrobial Stewardship Fundamentals

- Acute care hospitals are required to have antimicrobial stewardship programs by the Joint Commission,[2] the Centers for Medicare & Medicaid Services,[3] and the State of California (HSC 1288.85);[4] long-term care facilities also have requirements
- Stewardship teams are usually led by a pharmacist and/or physician, and ideally supported by hospital leadership
- Stewardship is multidisciplinary (e.g., pharmacists, physicians, nurses, quality improvement and hospital leadership, **infection preventionists**, laboratorians, information technologists, etc.)
- CDC publishes Core Elements of Stewardship to help guide stewardship programs[5,6]
- CDPH offers free consultations to all California facilities and maintains an acute care hospital stewardship Honor Roll with gold, silver, and bronze designations[7]

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Common Stewardship Interventions

- **Prospective audit and feedback:** Review active antimicrobial orders and discuss concerns directly with prescribers
- **Preauthorization:** Require stewardship team approval for use of restricted antimicrobials
- **Guidelines and order sets**: Help providers appropriately diagnose and treat common conditions
- **Health Record Documentation**: Require documentation of indication and duration for antimicrobials and indication for diagnostic tests

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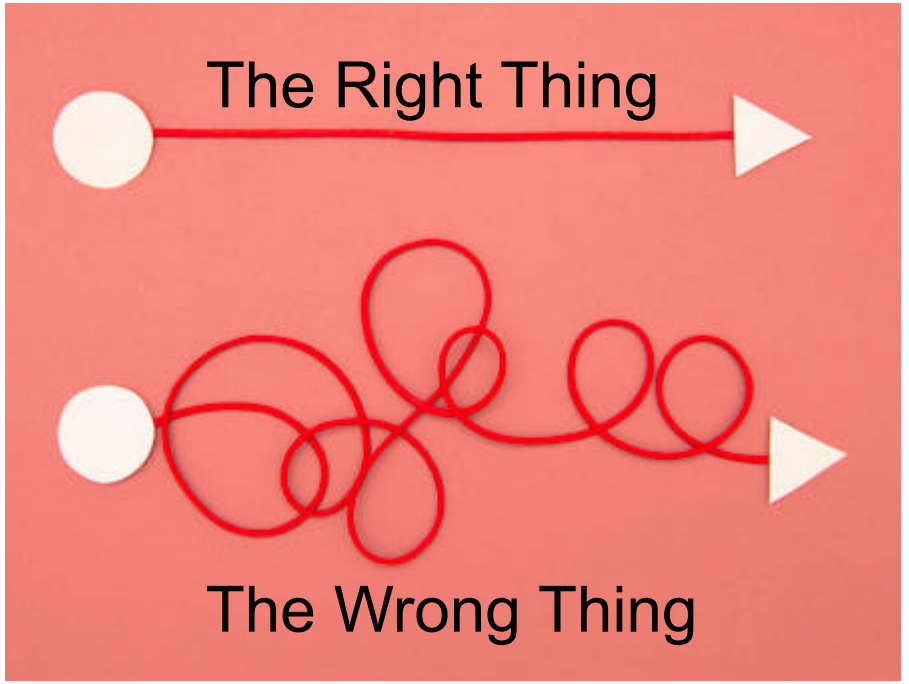
Other Common Stewardship Interventions

- Use the electronic medical record (EMR) to make it “easy to do right” and “hard to do wrong”
  - Pre-selected tests/treatments; nudges/stops to limit off-guideline ordering
  - Pre-selected appropriate surgical prophylaxis
- Track antimicrobial use and resistance at the facility, unit, and provider-level
  - Provide feedback on practices and opportunities for improvement
- Educate staff on stewardship principles



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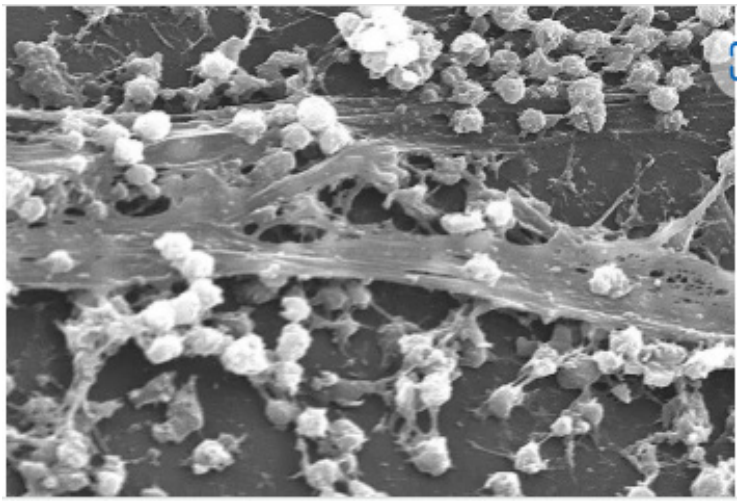
Audience Question

What is the daily risk that a urinary catheter becomes colonized with bacteria?



Indwelling Urinary Catheter Culture Stewardship: Overview | Urinary Tract Infection | CDC (www.cdc.gov/uti/hcp/clinical-guidance/index.html)

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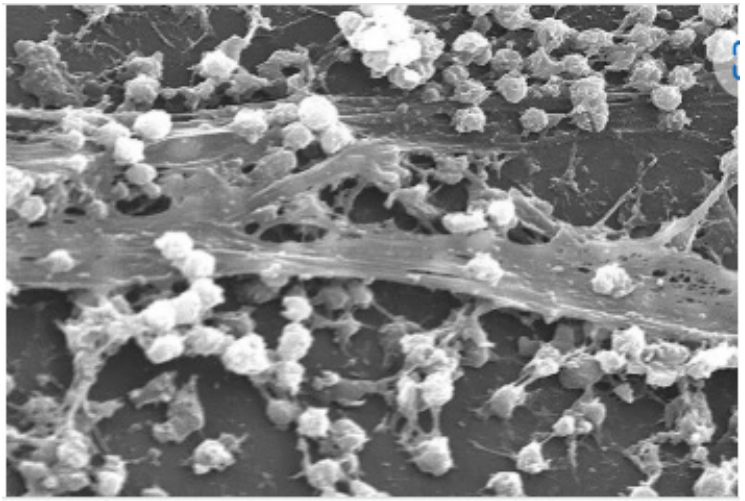
Urine Testing Should Be Thoughtful[8,9]

- Asymptomatic bacteriuria: bacteria in the urine of an asymptomatic patient due to colonization
  - Not the same as a urinary tract infection
  - Treatment is usually not indicated
- Asymptomatic bacteriuria and pyuria (white blood cells in the urine) are especially common in catheterized patients
  - Daily risk of developing bacteriuria in catheterized patients is 3-7%
  - Nearly all patients with urinary catheters will be colonized after one month
- Testing the urine when it's not needed can lead to incorrect diagnoses, unnecessary antibiotics, and patient harm



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Asymptomatic Bacteriuria/Pyuria Are Common[10]

Population	Prevalence of ASB	Prevalence of Pyuria in Persons with ASB
Female long-term care residents	25-50%	90%
Male long-term residents	15-35%	90%
Women > 90 years old	22-43%	
Women 65-90 years old	6-16%	
Healthy premenopausal women	< 5%	32%
Women with diabetes	9-27%	70%
Men with diabetes	1-11%	
People receiving hemodialysis	28%	90%
Presence of indwelling urinary catheter	>90%	50-100%

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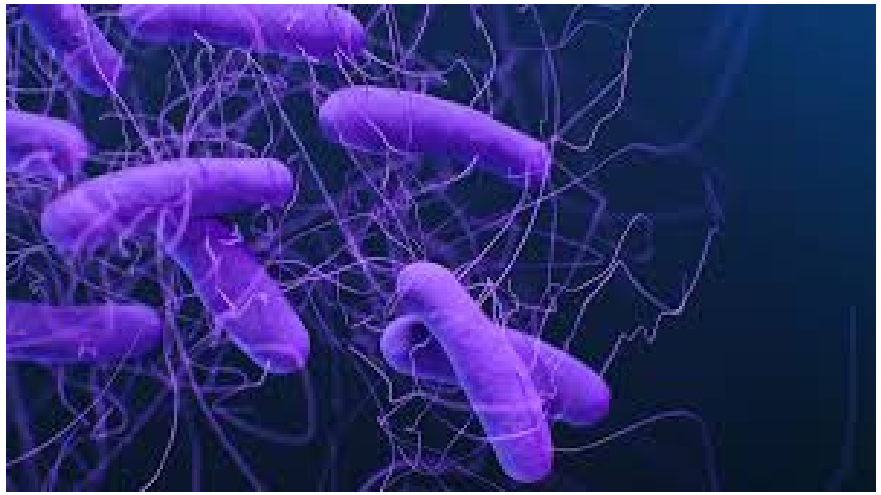
Diagnostic Stewardship: Urine Testing

- Generally, limit urine testing to patients with urinary symptoms* without alternative diagnoses
  - Use the electronic medical record (EMR) to create protocols, track urine testing, and discourage inappropriate testing
  - Monitor testing for appropriateness, especially after a CAUTI is diagnosed
  - *Patients with catheters may not always have classic urinary symptoms
- Samples from catheters should be fresh urine
  - Collected sterilely through a needleless sampling port
  - Quickly sent to lab for analysis
  - For long-term catheters, consider changing the catheter when testing is obtained

Audience Questions

1. What is the most important modifiable risk factor for *Clostridioides difficile* infection?

2. Under what circumstances, if any, might laboratories reject specimens sent for *Clostridioides difficile* testing?



C. diff | CDC
(www.cdc.gov/c-diff/index.html)

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Risk Factors for CDI[11]

- **Antibiotic exposure**
  - **Especially fluoroquinolones, third or fourth generation cephalosporins, clindamycin, and carbapenems**
  - **Admission to a room where the prior patient received antibiotics**
- Healthcare exposure
  - Long length of stay
  - Admission to a room where the prior patient had *C. difficile*
- Advanced age, chronic medical conditions
- Immunosuppression (e.g., chemotherapy, HIV, inflammatory bowel disease)
- Gastrointestinal surgery, tube feeding, possibly gastric acid suppression

CDI-Targeted Antimicrobial Stewardship[12,13]

- Antimicrobial stewardship plays an important role in reducing CDI
  - 63% of patients with CDI used antibiotics in the past 12 weeks
- Stewardship programs should:
  - Review patients with CDI and encourage stopping antibiotics where possible (stopping unnecessary antimicrobials is part of CDI treatment)
  - Prioritize antibiotics that are higher risk for causing CDI for review
  - Minimize duration of therapy of all antibiotics

CDI Diagnostics Are Challenging

- False positives: patients can be colonized with *C. difficile* but not have disease
  - Colonization with non-toxigenic strains
  - Colonization with toxigenic strains not producing toxin
    - Infants are often colonized but rarely have disease
  - False positive tests can lead to inaccurately high numbers of NHSN-reportable hospital-onset *C. diff* infections, misdiagnoses, and inappropriate treatments that may lead to patient harm
- False negatives: tests are not 100% sensitive and may be negative in patients with disease
  - False negative tests lead to patients with true disease being undiagnosed or misdiagnosed, potentially leading to patient harm

General *C. diff* Testing Considerations[14,15]

- Generally, limit testing to patients with new onset of 3 or more unformed stools in 24 hours, without another cause
- Do not routinely test patients who received laxatives within 48 hours
- Do not routinely test patients less than 12 months of age
  - Testing patients 12-24 months of age should be done with caution

Bristol Stool Form Scale

Type	Description	Image
Type 1	Separate hard lumps, like nuts	
Type 2	Sausage-shaped, but lumpy	
Type 3	Like a sausage or snake, but with cracks on its surface	
Type 4	Like a sausage or snake, smooth and soft	
Type 5	Soft blobs with clear-cut edges	
Type 6	Fluffy pieces with ragged edges, a mushy stool	
Type 7	Watery, no solid pieces	

Recognizing *C. diff* at Home (PDF) | CDC
(www.cdc.gov/healthcare-associated-infections/media/pdfs/recognizing-cdiff-at-home-508.pdf)

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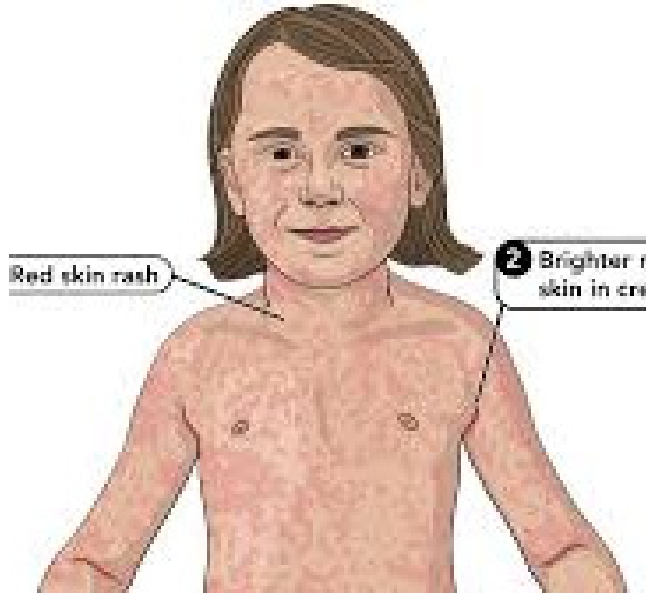
General Testing Considerations, Continued

- Avoid routine testing for resolution of CDI or testing asymptomatic patients
- Monitor adherence to your testing protocols and provide education where appropriate
- Use the electronic medical record (EMR) to implement order restrictions/stops/indications and make it harder to order inappropriately
- Implement a laboratory-based alert system to provide immediate notification of new cases to infection preventionists and clinical personnel

Clinical Guidance for *C. diff* Infection Prevention in Acute Care Facilities | CDC
(www.cdc.gov/c-diff/hcp/clinical-guidance/index.html)

One More Story

- A 4-year-old is seen in the emergency room for fever and rash
  - As part of the evaluation, a single blood culture is obtained
  - After antipyretics, the child looks well and is discharged
- 36 hours later (2AM), the parents receive a call that the child's blood culture is positive, and they need to return to the hospital
- On arrival, the child's symptoms have resolved
  - The child is admitted on intravenous antibiotics; repeat blood cultures are obtained
  - The original blood culture grows *Staphylococcus epidermidis*, follow up cultures are negative.
- The child is discharged after 48 hours of antibiotics



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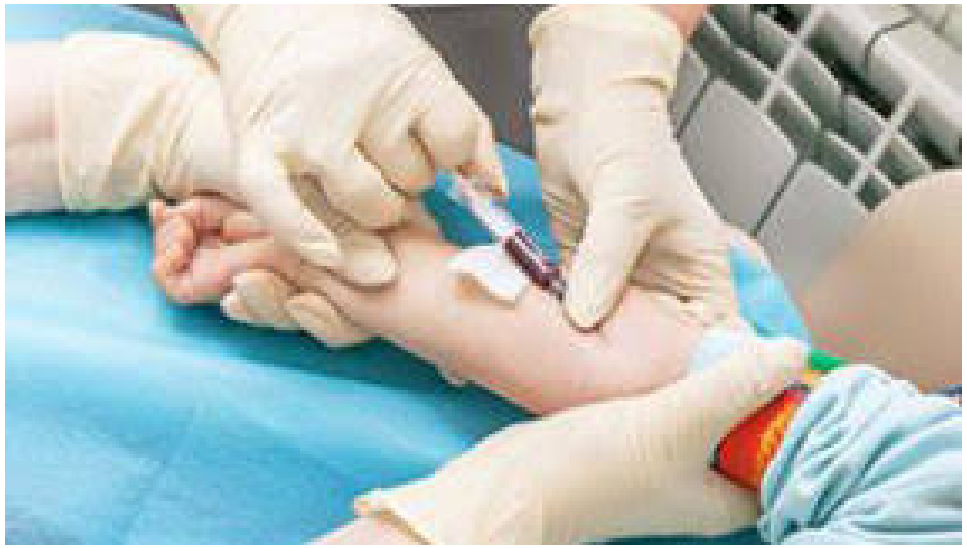
Blood Culture Contamination[16]

- Blood culture contamination may occur during culture collection, typically with skin organisms (from the skin or the catheter hub) due to:
  - Insufficient disinfection
  - Poor technique
- Blood culture contamination may lead to:
  - Increased costs (e.g., diagnostics)
  - Increased length of stay/admission
  - Unnecessary antibiotic exposure
  - Avoidable intravenous access
  - Unnecessary catheter removal
  - Delays in care
  - Avoidable NHSN-reportable central line associated bloodstream infections



Recommended Actions Based on Blood Lead Level | Childhood Lead Poisoning Prevention | CDC (www.cdc.gov/lead-prevention/hcp/clinical-guidance/index.html)

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Reducing Contaminated Cultures[16,17]

- Hospitals typically track blood culture contamination rates, IP is often involved: goal <3%; some hospitals are even lower (e.g., <1%)
- Interventions (use the EMR, educate providers, track and report rates, work with the stewardship teams)
  - Avoid cultures on patients unlikely to have bacteremia
  - Generally, only obtain blood cultures from central lines if a central line infection is suspected; central line cultures are more likely to be contaminated
  - Do proper skin, catheter hub, and/or blood culture bottle top antisepsis (and hand hygiene of course!)
  - Use phlebotomy teams to obtain cultures where possible
  - Provide feedback and education to units with high contamination rates
  - Consider ‘diversion’ of the initial blood specimen

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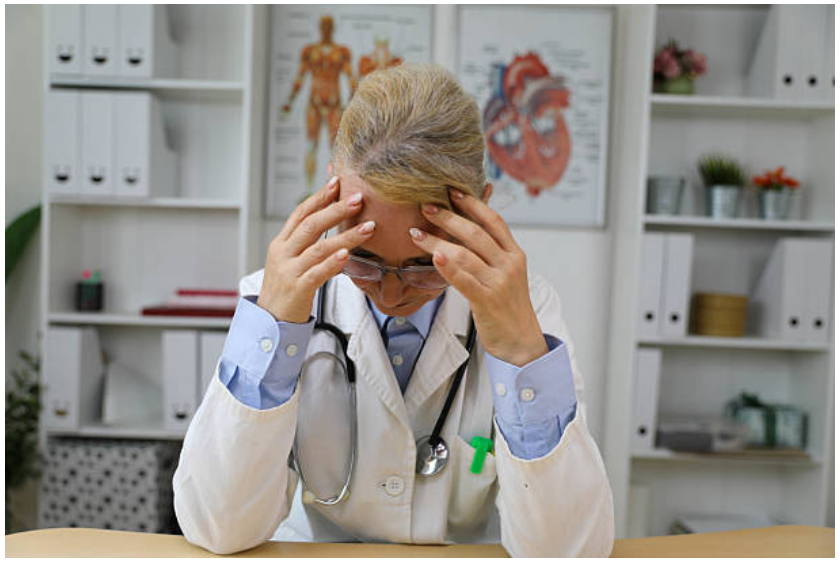
Stewardship and Transfer of Care

- Antimicrobials may be inappropriately continued, prolonged, or suboptimal at receiving facilities due to:
  - Incomplete laboratory results provided to the receiving facility (especially those that result after transfer)
  - Antibiotic indication not provided to the receiving facility
  - Start date, planned stop date, and planned duration not provided to the receiving facility



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Improving Transfer of Care[18]

- Transferring hospitals should have protocols to ensure receiving facilities obtain complete information at transfer and updated results after transfer
  - Transfer of care forms are ideally incorporated into the EMR and existing mechanisms for communication patient information
  - Transfer information should include antimicrobial information (e.g., indication, start date, planned stop date, culture results, pending results)


HEALTHCARE FACILITY TRANSFER FORM

Healthcare Facility Transfer Form Comprehensive (PDF) | CDPH (www.cdph.ca.gov/Programs/CHCQ/HAI/CDPH%20Document%20Library/InterfacilityTransferCommunication_Comprehensive.pdf)

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Stewardship Techniques	Possible Infection Prevention Examples and/or Collaborations with the Stewardship Team
Prospective audit and feedback	• "Device rounding" (when can the urinary catheter come out?) • Management of resistant organisms, including isolation precautions
Prior authorization	• Urine testing in patients with a urinary catheter • *Clostridioides difficile* testing
Guidelines, order sets, and EMR documentation	• Urinary tract infection and *Clostridioides difficile* testing • Central-line blood cultures; minimizing culture contamination • Surgical antimicrobial prophylaxis • Antimicrobial information at care transfer
Tracking outcomes, reviewing data, and providing feedback and education	• NHSN reporting of stewardship activities via annual survey • Rates of HAIs and contaminated cultures • Root-cause analyses for HAIs and providing recommendations • Guideline adherence (e.g., surgical prophylaxis)

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Key Points

- Inappropriate diagnostic and antimicrobial prescribing practices can lead to incorrect diagnoses, preventable NHSN-reportable infections, and suboptimal patient outcomes
  - *Clostridioides difficile* and urinary tract infections are prominent examples
- Antimicrobial stewardship and diagnostic stewardship programs improve patient outcomes and limit resistance
- Stewardship is a multidisciplinary effort that includes infection preventionists
- Infection preventionists may be asked to participate on or advocate for stewardship teams and projects
- CDPH offers stewardship consultations

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Additional References (1)

1. Assi et al. Infection Prevention and Antimicrobial Stewardship Program Collaboration During the COVID-19 Pandemic: a Window of Opportunity. 2021 | Curr Infect Dis Rep. (pubmed.ncbi.nlm.nih.gov/34426728/)
2. New and Revised Requirements for Antibiotic Stewardship. 2022 | TJC (https://digitalassets.jointcommission.org/api/public/content/b070043c50194fd2a2623d1e83aef60f)
3. QSO-22-20-Hospitals. 2022 | CMS (PDF) (www.cms.gov/files/document/qso-22-20-hospitals.pdf)
4. California Code, HSC 1288.85. (leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=HSC&sectionNum=1288.85.)
5. Core Elements of Hospital Antibiotic Stewardship Programs | Antibiotic Prescribing and Use | CDC (www.cdc.gov/antibiotic-use/hcp/core-elements/hospital.html)

CDPH

Additional References (2)

6. Priorities for Hospital Core Element Implementation | Antibiotic Prescribing and Use | CDC (www.cdc.gov/antibiotic-use/hcp/core-elements/hospital-implementation.html)
7. Stewardship Help and Support | CDPH (www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/AS_Support.aspx)
8. Patel et al. Strategies to prevent catheter-associated urinary tract infections in acute-care hospitals: 2022 Update | Infection Control & Hospital Epidemiology. 2023 | ICHE (pubmed.ncbi.nlm.nih.gov/37620117/)
9. Indwelling Urinary Catheter Culture Stewardship: Overview | Urinary Tract Infection | CDC (www.cdc.gov/uti/hcp/clinical-guidance/index.html)
10. Asymptomatic Bacteriuria One Pager | AHRQ (PDF) (www.ahrq.gov/sites/default/files/wysiwyg/antibiotic-use/long-term-care/one-pager-asymptomatic-bacteriuria.pdf)

CDPH

Additional References (3)

11. SHEA/IDSA 2017 Clinical Practice Guideline Update for Clostridium difficile Infection in Adults and Children (www.idsociety.org/practice-guideline/clostridium-difficile/)

12. *Clostridioides difficile* Infection (CDI) Surveillance | CDC (www.cdc.gov/healthcare-associated-infections/php/haic-eip/cdiff.html)

13. *Be Antibiotics Aware* Partner Toolkit | CDC (www.cdc.gov/antibiotic-use/php/usaaw-partner-toolkit/index.html)

14. Kociolek et al. Strategies to prevent Clostridioides difficile infections in acute-care hospitals: 2022 Update. 2023 | ICHE (PDF) (pubmed.ncbi.nlm.nih.gov/37042243/)

15. McDonald et al. Clinical Practice Guidelines for Clostridium difficile Infection in Adults and Children: 2017 Update by the Infectious Diseases Society of America (IDSA) and Society for Healthcare Epidemiology of America. 2018 | CID (pubmed.ncbi.nlm.nih.gov/29462280/)

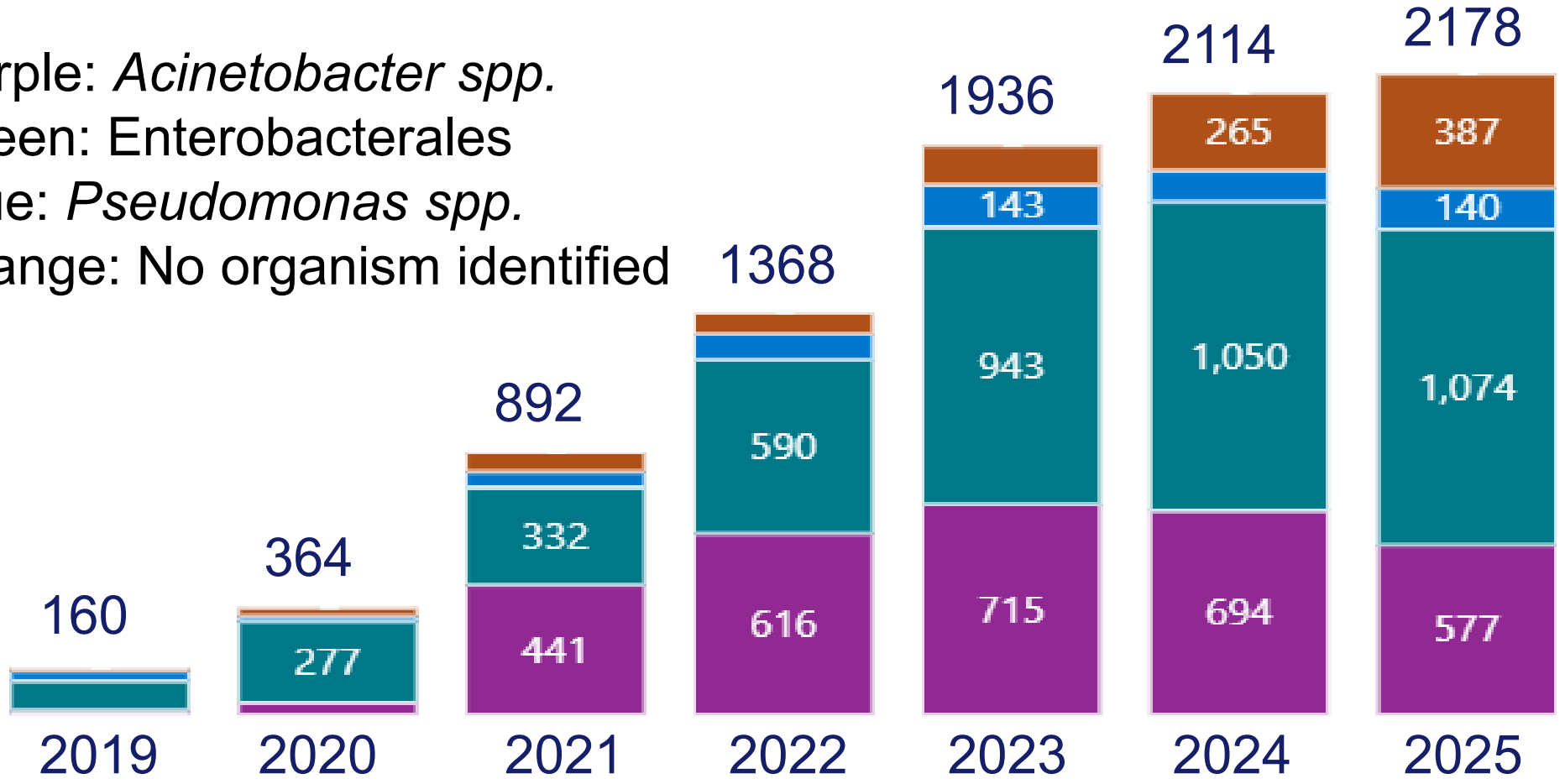
CDPH

Additional References (4)

16. Mermel et al. Should Blood Cultures Be Drawn Through an Indwelling Catheter?. 2024 | OFID (pubmed.ncbi.nlm.nih.gov/38770214/)
17. Blood Culture Contamination: An Overview for Infection Control and Antibiotic Stewardship Programs Working with the Clinical Laboratory | CDC (PDF) (www.cdc.gov/antibiotic-use/core-elements/pdfs/fs-bloodculture-508.pdf)
18. Healthcare Facility Transfer Form Comprehensive | CDPH (PDF) (www.cdph.ca.gov/Programs/CHCQ/HAI/CDPH%20Document%20Library/InterfacilityTransferCommunication_Comprehensive.pdf)

CDPH Has a Resistance Dashboard

Purple: *Acinetobacter spp.*
Green: Enterobacterales
Blue: *Pseudomonas spp.*
Orange: No organism identified



[Antimicrobial Resistance Dashboard | CDPH](www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/ARDataReporting.aspx) (www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/ARDataReporting.aspx)

All carbapenem-producing organisms became Title 17 Reportable 9/2022

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