

2024 Antimicrobial Stewardship

Antimicrobial Stewardship

2024

Objectives

Upon Completion of this Module, the participant will be able to:

- Define antibiotic stewardship and goals of an antimicrobial stewardship program
- Detail adverse effects of antimicrobial use
- Review the principles of optimal antimicrobial use in the inpatient setting
- Review the principles of optimal antimicrobial use in the ambulatory setting
- Outline Baptist Health Care Antimicrobial Stewardship program leaderships, interventions, and outcomes
- Successfully answer the Antimicrobial Stewardship Competency Questions

2024 Antimicrobial Stewardship

Definition

- Antimicrobial stewardship consists of systematic measurement and coordinated interventions designed to promote the optimal use of antimicrobial agents, including their choice, dosing, route, and duration of administration
- Applies not only to antibacterial agents, but antifungals, antivirals, and antiretroviral
- Antimicrobial Stewardship Programs work in conjunction with infection prevention and control to:
 - Improve patient outcomes
 - Prevent the development of antimicrobial-resistant pathogens
 - Reduce the spread of infections caused by antimicrobial-resistant pathogens
 - Prevents avoidable adverse effects from antibiotic use necessary.

Adverse Effects of Antimicrobial Use

- **Selection of pathogenic organisms such as *Clostridioides difficile* through changes in microbial flora**
- **Drug toxicity**
 - Direct effects
 - Examples: QT prolongation, nephrotoxicity, electrolyte abnormalities
 - Hypersensitivity
 - Drug interactions
- **The emergence of antimicrobial resistance**
 - Administration of an antimicrobial course to a patient exposes the approximately 10¹² bacteria in that patient to selective pressure, which may alter the intestinal microbiota for as long as a year
 - The United States Centers for Disease Control and Prevention estimates that more than 2.8 million infections caused by antimicrobial-resistant pathogens occur in the United States, resulting in more than 35,000 deaths

Principles of Optimal Antimicrobial Use In the Inpatient Setting

- **Antimicrobial allergy assessment**
 - Patients with suspected antimicrobial allergies:
 - May receive suboptimal therapy and/or broader-spectrum antimicrobial therapy than necessary.
 - Have been observed to have a longer hospital stay, increased risk for surgical site infection, greater likelihood of intensive care unit admissions, and higher rates of death than those without a reported antimicrobial allergy
 - Correcting an inaccurate antimicrobial allergy history in the medical record is very useful for guiding subsequent decisions regarding a patient's antimicrobial therapy
- **Initiation of empiric antibacterial therapy consists of the following:**
 - Choosing the optimal antimicrobial regimen (after obtaining culture[s] from relevant sites), taking into consideration:
 - The severity and trajectory of illness
 - The likely pathogens and their anatomic source
 - The likelihood of drug resistance
 - Host factors, including those that may preclude the use of a particular antimicrobial class, increase the risk of toxicity or influence the spectrum of coverage
- **Determining the appropriate dosing and route of administration**
- **Initiating antimicrobial therapy as promptly as possible.**

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- **Determining the appropriate dosing and route of administration**
- **Initiating antimicrobial therapy as promptly as possible**
- **Antimicrobial allergy assessment**
 - Patients with suspected antimicrobial allergies:
 - May receive suboptimal therapy and/or broader-spectrum antimicrobial therapy than necessary.
 - Correcting an inaccurate antimicrobial allergy history in the medical record is very useful for guiding subsequent decisions regarding a patient's antimicrobial therapy
- **Prescriber familiarity with local antibiograms for empiric therapies**
- **Identifying conditions for which antimicrobials are not indicated**
 - Examples include acute bronchitis, the common cold, other nonspecific upper respiratory infection or viral pharyngitis, and asymptomatic urinary tract infection
- **Identifying conditions for which watchful waiting or delayed prescribing is appropriate but underused**
 - Examples include acute otitis media and acute uncomplicated sinusitis
- **Using the shortest effective duration of therapy**
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Baptist Health Care Antimicrobial Stewardship Program

- **Established December 2008 at Baptist Health Care**
 - Founded by Sid Clements MD FACP and Rudy Seelmann PharmD BCPS
- **Current Antimicrobial Stewardship leadership:**
 - **Physician:** David Daley MD
 - **Pharmacist:** Shelby Gaudet PharmD BCPS, BCIDP, BCCCP
 - **Microbiology Manager:** Grace Agatep MLS, ASCP
 - **Infection Preventionist:** Michael Munson
- **Antimicrobial Stewardship Committee**
 - Bimonthly multi-disciplinary committee
 - Responsible for outcomes of the program

Baptist Health Care Antimicrobial Stewardship Program Interventions

- **Antimicrobial utilization oversight:**
 - Prospective audit and feedback model:
 - Trained pharmacy staff review antimicrobial orders and provide verbal or written recommendations to prescribers regarding optimization of antimicrobial use
 - The intervention does not delay the first dose of antimicrobial therapy, and acceptance of recommendations is voluntary
 - Select broad spectrum antimicrobials require a consult with an Infectious Disease specialists for continued therapy
 - The intervention does not delay the first dose of antimicrobial therapy
- **Pharmacokinetic Monitoring:**
 - Pharmacy automatic dosing of all pharmacokinetically adjusted antimicrobials
 - Pharmacy automatic dosing of renally adjusted antimicrobials not managed by an Infectious Disease Specialists
- **Facility-specific clinical protocols:**
 - Develop and maintain facility-specific clinical practice guidelines and pathways for common infections based on local epidemiology, susceptibility patterns, and drug availability or preference:
 - Examples include:
 - Antimicrobial Module
 - Sepsis Ordersets
 - Pneumonia Ordersets
 - ICU Ordersets
- **Electronic decision support:**
 - Information available at point of microbiology result review or orderset review to provide information that can assist with optimal antimicrobial use
 - Bi-annual Antibigram available on Baptist Health Care Pharmacy's Connect Page:
 - Facility:
 - Baptist Health Care Antibigram
 - Baptist Hospital Antibigram
 - Gulf Breeze Hospital Antibigram
 - Source:
 - Blood
 - Urine
 - Systemic

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Baptist Health Care Antimicrobial Stewardship Program Interventions

- **Diagnostic Tools Available:**

- Viral and bacterial PCR Panels for suspected respiratory infections
- Procalcitonin lab
 - Pro-hormone that is highly sensitive and specific for bacterial infection
 - Is used in conjunction with clinical signs and symptoms to determine if a bacterial infection is likely or not
 - Can assist clinicians on decision to initiate/continue antibiotics

- **Education on antimicrobial stewardship provided:**

- New hire orientation
- Annual competencies
- Service line meetings
- Pharmacy Newsletter sent out by Medical Affairs

Baptist Health Care Antimicrobial Stewardship Program Outcomes

- **Antimicrobial Stewardship Committee is responsible for the outcomes of the Antimicrobial Stewardship Program at BHC:**

- **Measuring antimicrobial use and cost savings:**

- Defined daily dose for antimicrobials reviewed across the facilities and practitioner specialties
- Cost per patient day

- **Process Measures:**

- Types and acceptance of prospective audit and feedback recommendations
- Utilization of restricted antibiotics
- Clostridioides difficile infection rates
- Multi-drug resistant organism (MDRO) infection rates
- Emergence of antimicrobial resistance over time
 - Antibiogram Trending Data
- Ambulatory utilization of antimicrobials for viral infections
- Ambulatory utilization of appropriate empiric antimicrobials for urinary tract infections

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References

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