# The Importance of Antimicrobial Stewardship in Clinical Practice

## Optimizing Patient Outcomes and Combating Resistance

Last updated 1/2025

# Overview

**Antimicrobial Stewardship (AMS) is the judicious use of antimicrobials to promote the best patient outcomes while minimizing the risk of adverse events.**

This presentation provides a guide for antimicrobial stewardship at BHSET. It includes information on topics such as:

- Antimicrobial selection and dosing
- Avoiding unnecessary antimicrobial use
- Reportable metrics
- Your role in antimicrobial stewardship!

# Overview

Antimicrobial stewardship is an important part of providing high-quality patient care.

By following the recommendations in this guide, you can help to ensure that your patients receive the appropriate antimicrobials, at the right doses, for the shortest possible duration.

This will help to prevent antimicrobial resistance and promote patient safety.

# Introduction to Antimicrobial Stewardship (AMS)

**What is an Antimicrobial?**

- Antib*iotic*: medication used to treat bacterial pathogens

- Anti*microbial*: umbrella term for medications used to treat all kinds of pathogens, including fungi (antifungal), viruses (antiviral), and parasites (antiparasitic), in addition to bacteria

- In this presentation, we will be using “antimicrobial” since it relates to the use of all medications used to treat various pathogens

# Introduction to Antimicrobial Stewardship (AMS)

**What is Antimicrobial Stewardship?**

- CDC Definition: A coordinated effort to optimize antimicrobial use and combat antimicrobial resistance

- Key Goals: Improve patient outcomes, reduce adverse events, reduce resistance, and saves costs

- Core Strategies: Ensure the right antimicrobial, at the right dose, through the right route, for the right duration

# The Growing Threat of Antimicrobial Resistance

- In the United States, more than 2.8 million antimicrobial-resistant infections occur each year. More than 35,000 people die as a result, according to CDC's *2019 Antibiotic Resistance Threats Report.*
- AR is a naturally occurring process. However, increases in antimicrobial resistance are driven by a combination of germs exposed to antibiotics and antifungals, and the spread of those germs and their resistance mechanisms.
- With increased travel, global and national antimicrobial resistance trends can have a local impact on patient morbidity, mortality, and healthcare costs.
- Antimicrobial stewardship (AMS), lead by a designated institutional program (ASP) plays an important role in in mitigating antimicrobial resistance.

## CIHQ Accreditation Standards for Antimicrobial Stewardship Programs (ASP)

- Hospitals MUST have a written ASP aligned with national guidelines
- **ASP Leader(s) Responsibilities**:
  - Develop and implement the hospital-wide ASP based on national guidelines.
  - Collaborate with medical, pharmacy, and nursing leadership.
  - Align AMS activities with Infection Prevention and Control (IPC) and Quality Assurance & Performance Improvement (QAPI) programs.
  - Document program activities, including improvements in antibiotic use.
  - Communicate and implement system-wide policies.
  - Provide competency-based training and education for hospital staff and contracted personnel.
  - Monitor and report the effectiveness of AMS interventions.

# BHSET Antimicrobial Stewardship Program Structure

- **Leadership:**
  - Medical Director: Rayhan Hashmey, MD
  - Pharmacist Leader: Liliana Pimentel, PharmD, BCIDP
  - Infection Prevention & Control: Jessica Jagneaux, BSN, RN, RNC-LRN, CIC
  - Microbiology: Leisa Freeman, MT (ASCP); Christopher Jannise, MLS (ASCP), CME
  - Information Technology: Joy Blacksher, RN
  - Nursing Leader: Tracie Lutz, RN, MSN, CEN
  - Quality Improvement: Diana Miles, RN, BSN

# Developing Evidence-Based Guidelines

- Developing local treatment protocols based on national guidelines
- Involvement of multidisciplinary team in guideline creation
- Importance of institutional guidelines is to align antimicrobial prescribing with national best practices

- Sources of Guidelines:
  - **Society for Healthcare Epidemiology of America (SHEA)**
  - **Infectious Diseases Society of America (IDSA)**
  - **American Society for Health-System Pharmacists (ASHP)**
  - **Society of Infectious Disease Pharmacists (SIDP)**

# BHSET Evidence-Based Treatment Guidelines

- We use facility-specific guidelines based on:
  - National recommendations (CDC, SHEA, IDSA, ASHP, SIDP)
  - Local pathogen susceptibilities (i.e. annual antibiogram)
- These guidelines are integrated into our electronic order sets for:
  - Community acquired pneumonia
  - UTI/Pyelonephritis
  - Cellulitis
  - Sepsis
  - And more...

# Inpatient Antimicrobial Stewardship Strategies

- **Key Strategies**:
  - **Prospective audit and feedback**: Reviewing antimicrobials *after* initiating therapy to offer recommendations for optimization.
  - **Formulary restrictions and Preauthorization**: Requiring approval *before* initiating therapy for certain broad-spectrum or high-risk antimicrobials.
  - **Rapid diagnostics**: Identifying infections faster to start targeted therapy sooner.

# Inpatient Antimicrobial Stewardship Strategies

- **Key Strategies**:
  - **De-escalation:** Recommending narrower-spectrum antimicrobials to reduce the development of resistance and side effects caused by collateral damage.
  - **Dose optimization:** Adjusting therapy based on patient-specific factors (e.g., renal function, pharmacokinetic/pharmacodynamic optimization).
  - **IV to PO conversion**: Transitioning from intravenous to oral therapy when appropriate.

# AMS on Discharge

- **Key Considerations**:
  - Proper discharge planning helps prevent unnecessary readmissions
  - Double-check appropriate antibiotic agent, duration and formulation
  - Transition to oral antibiotics when possible
  - Document treatment plans and ensure follow-up

# BHSET Stewardship Interventions

- **Priority Interventions:**
  - Prospective audit and feedback for broad-spectrum antibiotics
  - Preauthorization for restricted antimicrobials
- **Pharmacy-Driven Interventions:**
  - Questionable Medication Orders
  - Automatic Therapeutic Drug Monitoring
  - Renal Dosing Adjustment
  - Automatic IV to PO Conversion
  - Automatic Stop Orders after 7 days
  - Transitions of Care review of antibiotics on discharge for qualifying patients

# Antimicrobial Stewardship Metrics

- **Process Measures**:
  - Antimicrobial use metrics via Days of Therapy (DOT).
  - Monitoring adherence to hospital treatment guidelines.
- **Outcome Measures**:
  - Reduction in healthcare-associated infections (HAIs) and *Clostridium difficile* infections (CDIs).
  - Tracking antibiotic resistance patterns and their reduction.
  - Improvement in patient outcomes (length of stay, readmissions).
- **Reporting**: Share metrics with the Infection Control Committee, Quality Assurance and Performance Improvement (QAPI), and governing body.

# Individual Roles

How YOU play a part in Antimicrobial Stewardship

# Role of **Physicians** in Antimicrobial Stewardship

- **Responsibilities**:
  - Follow guidelines when selecting initial empiric therapy
  - Reassess based on diagnostic results and adjust or de-escalate to targeted therapy
  - Discontinuing antibiotics when no longer needed
  - Communicate with the ASP team to ensure best practices

# Role of **Pharmacists** in Antimicrobial Stewardship

- **Responsibilities**:
  - Adjust dosing based on patient-specific factors (e.g., renal/hepatic function, pharmacokinetics)
  - Optimize agent selection based on drug-specific factors (pharmacodynamics)
  - Participate in prospective audits and feedback
  - Facilitating IV to PO transitions
  - Educate prescribers on appropriate antimicrobial selection and formulary availability

# Role of **Nurses** in Antimicrobial Stewardship

- **Responsibilities**:
  - Ensuring timely administration of antibiotics
  - Monitor for adverse drug reactions and report them promptly
  - Educate patients on proper antibiotic use and adherence
  - Collaborate with the care team to ensure appropriate antibiotic therapy
- **BHSET Nurse's Role:**
  - Optimizing culture testing
  - Ensuring proper culture collection
  - Discussing treatment plans with prescribers
  - Evaluating penicillin and sulfa allergies

# Role of **Microbiologists** in Antimicrobial Stewardship

- **Actions**:
  - Providing timely and accurate diagnostic results
  - Supporting rapid diagnostic testing (e.g., PCR)
  - Assisting in antimicrobial susceptibility testing

- **BHSET Microbiology/Lab's Role:**
  - Automatic testing for resistance in multidrug resistant organisms (MDROs)
  - Validation of new antimicrobial tests
  - BHSET antibiogram creation
  - Rapid diagnostics (Verigene, Cepheid PCR)
  - Multi-step *C. difficile* testing
  - TB, HIV 2-step

# Role of **Infection Prevention** in Antimicrobial Stewardship

- **Actions**:
  - Surveillance of healthcare-associated infections (HAIs)
  - Collaborating on antimicrobial resistance reports
  - Engaging in outbreak investigations
- **BHSET's Infection Prevention and Control:**
  - Updating, maintinging, and enforcing isolation precautions

# Continuous Education on Antimicrobial Stewardship

- **ASP Team Education**: Ongoing education on the latest stewardship strategies.
  - **Training Sources**:
    - **Society for Healthcare Epidemiology of America (SHEA)**.
    - **Infectious Diseases Society of America (IDSA)**.
    - **Society of Infectious Disease Pharmacists (SIDP)**.
- **Competency-based training**: Ensure hospital staff and contractors are trained on AMS guidelines and protocols.
- **Ongoing Education**: Incorporating new antibiotics, updated resistance patterns, and stewardship innovations.

# Conclusion and Call to Action

- **Key Takeaways**:
  - Antimicrobial stewardship is essential for improving patient care and combating resistance.
  - Multi-disciplinary collaboration is crucial. Active involvement from all healthcare professionals is required.
- **Call to Action**:
  - Engage all hospital personnel in continuous AMS education and adherence to established guidelines.
  - Emphasize commitment to stewardship principles and ongoing education.

# Question 1

True or False:

The CIHQ accreditation board requires hospitals to provide competency-based training and education for hospital staff and contracted personnel.

Answer: TRUE

# Question 2

**Which of the following is/are core strategies in antimicrobial stewardship?**

A. Ensuring the right antimicrobial agent is selected, with appropriately narrow spectrum of activity
B. Using the right dose for the patient's individual parameters (e.g. weight, renal function, age)
C. Administering antimicrobials through the right route to ensure activity at site of infection
D. Ordering for the right duration, including counting number of days of inpatient antimicrobial received when prescribing at discharge
E. All of the above

Answer: E

# Question 3

**Which intervention can be performed by nurses, pharmacists, and physicians?**

A. Adjust vancomycin dose based off of pharmacokinetic parameters
B. Evaluate penicillin and sulfa allergies, including how long ago it occurred and documenting the nature and severity of reaction
C. Collect blood cultures using proper sterile technique
D. Prescribe antibiotics for outpatient use on discharge for the right duration

Answer: B

All clinical staff are encouraged to review patient allergies for accuracy. Clarifying allergies and reactions can help patients receive the best antimicrobial for their infection while avoiding risk to those who have true allergies.