

Antimicrobial Stewardship Policy

Example 1

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Policy Division:		Policy #:
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Purpose: To develop a formalized pharmacy-driven antimicrobial stewardship program. This program is intended to maximize positive patient outcomes while curbing inappropriate use of antimicrobials. The goals of the program will include slowing down the emergence of antimicrobial resistance through the optimization of selection, dosing, and duration of the therapy. Additional goals also include reducing the incidence of drug-related adverse events, lowering rates of morbidity and mortality, as well as decreasing the length of hospitalization and overall cost.

Background: Antimicrobial stewardship is used in practice settings of health systems to improve patient outcome, minimizing the unintended consequences of antimicrobial use realizing reduction in drugs. In the Hospital, resistance to antimicrobial and antifungals poses the greatest concern. Significant number of deaths every year attributed to infection caused by antimicrobial resistance pathogens. Development of antimicrobial has decreased over the last 2 decades and options are limited to treatment of infections caused by increasingly resistance microorganism. treatment has slowed down and we have limited options to treat the increasingly resistant infections.

Background: Antimicrobial agents have been widely available for approximately 70 years. While resistance to these drugs is not a new trend, it has become of increasing concern in recent years due to the escalating number of multi-drug resistant organisms. In 1999, a congressional hearing was held on “Antimicrobial Resistance: Solutions to a Growing Public Health Problem.” Following the hearing, the Interagency Task Force on Antimicrobial Resistance was formed and includes members from ten federal agencies including the Centers for Disease Control and Prevention (CDC), Food and Drug Administration (FDA), and National Institutes of Health (NIH). The Task Force published the first action plan to combat antimicrobial resistance in 2001. The most recent revision to the action plan was released in 2011 and focused on four main areas that are considered to be critical for implementation in the next three to five years: surveillance, prevention and control, research, and product development.¹ While research and drug development are slow processes, much focus has been placed on reducing emerging resistance through proper utilization of the antimicrobials currently available. In 2007, the Infectious Diseases Society of America (IDSA) and the Society for Healthcare Epidemiology of America

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(SHEA), published updated guidelines regarding implementation of an institutional antimicrobial stewardship program.² Since then, multiple organizations including the American Medical Association (AMA) and the American Society for Health-System Pharmacists (ASHP) have released statements in support of the initiative.^{3,4} The IDSA-SHEA guidelines provide a basic framework for development of an antimicrobial stewardship, but recommend that the components be tailored to meet institution-specific needs.

Methods:

Based on initial analysis by pharmacy services, these are the primary goals of Antimicrobial Stewardship Program, each to be evaluated and expanded upon when needed.

- A. First, a designated multidisciplinary team will be formed, which will include the infectious disease specialist, clinical pharmacist, microbiology staff, quality control representative, and nursing staff members.
 - a. The AST meets quarterly where they review reports of the recommendations for quality assurance purposes. .

1. Prospective audit and feedback

- a. Pharmacy team receives report generated via Senti7 daily.
- b. Pharmacy team reviews all patients receiving antimicrobial therapy, follow up on cultures and sensitivities, assess appropriate dosing, and then coordinate these data with the infectious disease physician according to the level of complexity and acuity of cases.
- c. Pharmacy team communicates recommendations to the prescribers.
- d. Pharmacy team and the ID physician will round for 1 hour per day, 3 days per week discussing complicated cases.
- e. Pharmacy team will perform the necessary data collections prior to the scheduled rounds
- f. During rounds, the clinical pharmacist will present each clinical case to the ID physician with possible recommendations.
- g. Recommendations will be written in the patient's chart or can be discussed verbally with prescribing physician in urgent cases.

2. Antibiotic "Time outs"

- a. Clinical Pharmacist will re-evaluate all the antibiotic 48-72 hours after initiation. Clinical pharmacist will determine the necessity of continuation, and assess the appropriate dose, and route of administration based on available cultures.

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3. Protocols and treatment algorithms will be written for antimicrobial use according to infectious disease guidelines, tailored towards common Cookeville Regional Medical Center pathogens and resistance trends.
 - a. Create and/or update order sets according to the current evidence, practice guidelines and hospital antibiogram.
 - b. Ensure that antimicrobials from the formulary are aligned with hospital antibiogram.
 - c. Algorithms will be put in place to aid pharmacists and clinicians in transition of bioequivalent antimicrobials from intravenous to oral formulations.
4. A data of all encounters of antimicrobial resistance will be maintained through the pharmacy department, in accordance with the proposed government regulations.
5. Education:
 - a. Focus will also be put on education through conferences, email alerts, and grand rounds to address issues relevant to patient antimicrobial care.
 - b. Subsequently, algorithms will be put in place to aid pharmacists and clinicians in transition of bioequivalent antimicrobials from intravenous to oral formulations.
6. A data of all encounters of antimicrobial resistance will be maintained through the pharmacy department, in accordance with the proposed government regulations.
7. The Antimicrobial stewardship program will help facilitate multidisciplinary coordination and management of antimicrobial treatment and potentially reduce cost and rates of resistance in the hospital setting.
8. De-escalation/Streamlining of Therapy
 - a. Long term goal is to stabilize and eventually improve resistance patterns within the System. While empiric broad-spectrum antimicrobial coverage is needed for many patients when they present to the hospital with a suspected infection, an important aspect of stewardship is streamlining therapy once cultures become available (de-escalation). De-escalation recommendations will be placed in the chart under the progress note section.

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Empiric Therapy

Due to the large volume of admissions with pneumonia and urinary tract infections, these areas will be of initial focus to the antimicrobial stewardship program (ASP). Clinical evidence-based practice guidelines can be useful as a baseline for appropriate empiric therapy based on suspected infection site and/or organism. Therefore, initial antimicrobial selection recommendations shall be based upon current practice guidelines for the suspected infection. Applicable guidelines are referenced below and clinical pathways are available as needed.^{5,6,7,8,9} Pharmacist surveillance will occur utilizing the currently available clinical decision support system (CDSS). Recommendations will be placed in the chart under the progress note section and are not part of the permanent record. Urgent recommendations shall be made in person or by telephone.

Dose Optimization

Due to the pharmacokinetic and pharmacodynamic properties of certain antimicrobials, different dosing strategies can be employed to help reduce resistance and optimize therapy. As determined by the Pharmacy & Therapeutics Committee decision, orders for the subsequent antibiotics will be substituted as follows^{10,11}:

Piperacillin/Tazobactam

CrCl > 20 mL/min: 3.375 g IV every 8 hours infused over 4 hours
 CrCl < 20 mL/min: 3.375 g IV every 12 hours infused over 4 hours

Meropenem

CrCl > 25 mL/min: 500 mg IV every 6 hours infused over 3 hours
 CrCl 10-25 mL/min: 500 mg IV every 12 hours infused over 30 minutes
 CrCl < 10 mL/min: 500 mg IV every 24 hours infused over 30 minutes

Levofloxacin

CrCl > 50 mL/min: 750 mg IV or PO every 24 hours
 CrCl 20-50 mL/min: 750 mg IV or PO every 48 hours
 CrCl < 20 mL/min: 500 mg IV or PO every 48 hours

Formulary Restriction

The following antimicrobials are currently on formulary restriction for non-infectious disease providers as determined by the Pharmacy & Therapeutics Committee and shall require pre-authorization prior to prescribing:

Daptomycin
 Ertapenem
 Linezolid
 Tigecycline
 Quinupristin/dalfopristin

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