

Executive Summary: Antimicrobial Stewardship Program Development

Situation

Antimicrobial resistance and escalating health care costs have brought worldwide attention to antimicrobial use. The Joint Commission has approved a new Antimicrobial Stewardship Standard, effective January 1, 2017. This standard requires hospitals to have an antimicrobial stewardship program. Among the eight elements of performance, leaders must establish antimicrobial stewardship as an organizational priority.

Background

Despite efforts to control the spread of multidrug resistant organisms (MDROs), the incidence of infections attributed to MDROs continues to rise. The Infectious Diseases Society of America (IDSA) and the Society for Healthcare Epidemiology of America (SHEA) have advocated for hospitals to establish formal programs in an effort to combat hospital-acquired infections and antimicrobial resistance. In 2015, (hospital) spent \$400,000 on antimicrobials.

Although they are often life-saving, antimicrobials can also cause serious harm to patients. Their use contributes to the selection of drug-resistant organisms, a phenomenon sometimes referred to as “collateral damage”. Inappropriate antimicrobial usage is a significant problem. The Centers for Disease Control and Prevention (CDC) estimates 30-50% of antimicrobial usage in hospitals is unnecessary or inappropriate. The emergence of bacteria for which no effective antimicrobials are available is a current reality, and the antimicrobial development pipeline has few options on the horizon, heightening concerns. In the United States, more than two million people are infected with antimicrobial-resistant organisms, resulting in approximately 23,000 deaths annually.

Antimicrobial stewardship is defined as coordinated efforts that ensure optimal antimicrobial selection, dose and duration that leads to the best clinical outcome for the treatment or prevention of infection, while producing the fewest possible side effects and the lowest risk for subsequent resistance. Antimicrobial stewardship programs may conduct a variety of interventions that are complementary to effective infection prevention programs. These interventions vary based on local needs, resources, and expertise, and have demonstrated to result in significant improvements in microbiological outcome (e.g. reduction of antimicrobial-resistant bacteria) and clinical outcomes (e.g. reduction of antimicrobial associated morbidity and length of hospital stay).

The Joint Commission will start surveying on their antimicrobial stewardship standard, MM.09.01.01 in January 2017. EP 5 of the standard clearly outlines the core elements of a compliant stewardship program.

- Leadership commitment: Dedicating necessary human, financial, and information technology resources.
- Accountability: Appointing a single leader responsible for program outcomes.
- Drug expertise: Appointing a single pharmacist leader responsible for working to improve antimicrobial use.
- Action: Implementing recommended actions, such as systemic evaluation of ongoing treatment need, after a set period of initial treatment (for example, “antimicrobial time out” after 48 hours).
- Tracking: Monitoring the antimicrobial stewardship program, this may include information on antimicrobial prescribing and resistance patterns.

- Reporting: Regularly reporting information on the antimicrobial stewardship program, which may include information on antimicrobial use and resistance, to doctors, nurses, and relevant staff.
- Education: Educating practitioners, staff, and patients on the antimicrobial program, which may include information about resistance and optimal prescribing.

Assessment

Leadership Commitment

(Hospital) currently has no formal antimicrobial stewardship program. The Pharmacy Department provides some antimicrobial stewardship activities, and has information technology resources to help them do so.

Accountability

(Hospital) currently has no single leader who is responsible for antimicrobial stewardship outcomes. The Director of Pharmacy and Clinical Pharmacy Manager pursue antimicrobial stewardship as opportunities as they arise, and as time and priorities allow.

Drug Expertise

(Hospital) currently has no single pharmacist leader responsible for working to improve antimicrobial use. The Clinical Pharmacy Manager directs antimicrobial stewardship activities, but this is not her primary focus, and as such, we are missing out on several high value opportunities for improvement.

Action

Pharmacists at (hospital) currently pursue several antimicrobial stewardship interventions, including optimizing antimicrobial dosing and route, evaluating antimicrobial appropriateness based on microbiology results, and contacting prescribers with recommendations to adjust antimicrobial selection. These recommendations are received with variable acceptance from prescribers. We are currently not pursuing any hard-wired interventions, such as antimicrobial restrictions or enforcement of infection treatment protocols. Joint Commission expects established treatment protocols to drive practice, not just be suggestions.

Tracking

(Hospital) currently has mixed performance in the area of tracking. Pharmacy and Laboratory work together each year to create an antibiogram, which shows bacterial resistance patterns and helps clinicians best determine empiric therapy. The antibiogram is strategically linked in our electronic health record. The Infection Prevention Committee tracks and reports on the incidence of multidrug resistant organisms. (Hospital) is currently not tracking antimicrobial prescribing in any meaningful way.

Education

Two (hospital) pharmacists have completed the Society for Infectious Disease Pharmacists Certificate Program on Antimicrobial Stewardship. Other pharmacists are currently receiving education based on this content. There are currently no initiatives at (hospital) to educate prescribers, other staff, or patients about antimicrobial resistance and optimal prescribing.

(Hospital) has several strengths that could be leveraged:

- Current experience and knowledge of 2 specially trained pharmacists and a skilled infection preventionist.

- Excellence in incorporating new services and initiatives.
- Pharmacists and infection preventionist possess strong interdisciplinary working relationships, excellent communication skills

(Hospital) has some internal weaknesses that must be considered:

- We do not have dedicated pharmacist resources to move our antimicrobial stewardship activities to the next level, and achieve compliance with the Joint Commission standard.
- Our physician culture is not always responsive to feedback about their practice.
- We do not have an infectious disease physician.

The following opportunities are available:

- Decrease inappropriate antimicrobial use.
- Decrease the rate of hospital-acquired infections caused by multi-drug resistant organisms.
- Decrease antimicrobial drug spend.
- Compliance with regulatory standards (TJC).

The following external threats are known:

- Financial pressures continuing to make resources scarce.
- Influence on physician prescribing by the pharmaceutical industry.

Recommendation

Add 0.5 pharmacist FTE to the Inpatient Pharmacy staff to create and lead a formal Antimicrobial Stewardship Program. The Antimicrobial Stewardship Program would be a sub-committee to the Pharmacy and Therapeutics Committee. Other program team members will include medical staff, a clinical microbiologist, the infection preventionist, and the informatics pharmacist.

Program Objectives

1. Identify and lower inappropriate antimicrobial use
 - a. Develop guidelines, policies, and PowerPlans for optimizing antimicrobial therapy
 - b. Provide post-prescribing review, including tailoring antimicrobials to ensuing microbiology results
2. Decrease the rate of hospital-acquired infections associated with multi-drug resistance.
3. Ensure appropriate monitoring of antimicrobials with known safety concerns (e.g. aminoglycosides and renal dysfunction, interactions with warfarin, etc.)
4. Track antimicrobial utilization and resistance patterns
5. Evaluate diagnostic methods and microbiological culturing
6. Maximize prescriber acceptance of antimicrobial stewardship practices
 - a. Broad consultation with prescribers, microbiologists and infection control leaders to develop policies, maximizing physician input and autonomy where possible
 - b. Individualized feedback to prescribers whose antimicrobial utilization is outside their peers' practice
 - c. Escalation of restrictions: early in the program, restrictions must be "milder" to minimize physician "push-back"
7. Educate and provide feedback to prescribers regarding antimicrobial use and resistance patterns
8. Facilitate the discharge and follow-up of patients receiving intravenous antimicrobials
9. Develop an outpatient infusion antimicrobial treatment program

Expected Program Outcomes

- Decrease antimicrobial expenditure by 10% (approximately \$40,000)
- Prevent overuse of several new, expensive antimicrobials that have been launched for multi-drug resistant organism
- Decrease the number of opportunistic infections arising from antimicrobial use (e.g. *C. difficile*, invasive candidiasis, Pseudomonas and other environmental Gram-negative infections)
- Reduced indirect costs associated with antimicrobial use at (hospital) from:
 - infection-control costs (e.g. isolation bed-days)
 - Peripherally-inserted central catheter (PICC) lines
 - Length of stay
- Achieve compliance with the Joint Commission standard MM.09.01.01.

Expected Program Costs

- Cost of pharmacist (wage and benefits) - \$70,000/year
- Re-allocation of additional antimicrobial stewardship program team members time from other projects

References

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