

The Role of the Hospital Epidemiologist in Antibiotic Stewardship



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KEYWORDS

- Antibiotic stewardship • Hospital epidemiology • Infection prevention
- Collaboration • Antibiotics

KEY POINTS

- Antibiotic stewardship programs (ASPs) are crucial to promote the judicious use of antibiotics.
- ASPs can prevent adverse events related to antibiotic use and lead to cost savings.
- There is great overlap between ASPs and infection control programs in terms of outcome measures, methodology, and technologies used. Integration of these programs can lead to synergy.
- Hospital epidemiologists can support ASPs by sharing data, collaborating on educational programs, helping to advocate for resources, and providing leadership.

INTRODUCTION

Multidrug-resistant organisms (MDROs), including methicillin-resistant *Staphylococcus aureus* (MRSA), vancomycin-resistant enterococci (VRE), and carbapenem-resistant Enterobacteriaceae pose a serious threat to health care today.^{1,2} Although antibiotics have improved survival from life-threatening infections, injudicious use contributes to the emergence of MDROs.^{1,3,4} Successful control and prevention of MDROs can be achieved through leadership commitment and investment in human

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and scientific resources.² Apart from MDROs, injudicious use of antimicrobials also contributes to *Clostridium difficile* infections (CDI).⁵ According to a Centers for Disease Control and Prevention (CDC) estimate, approximately 30% to 50% of all antimicrobial use is either inappropriate or unnecessary.³ The establishment of ASPs has been mandated for hospitals and nursing care centers in the United States by the Joint Commission.⁶ Hospitals and health care systems should focus on developing infection control programs (ICPs) and ASPs led by physicians with specialized training in infectious diseases.² ICPs, led by hospital epidemiologists, are usually older and more established within hospitals. Given the overlap between ICP and ASP goals, metrics, and technologies, these programs present natural opportunities for synergy.

Evidence suggests that ASPs positively impact the quality of patient care and safety, decrease the likelihood of adverse events associated with antimicrobial use, improve infection cure rates, and decrease the rates of treatment failures through optimized use of antibiotics for treatment and prophylaxis.³ Establishment of these programs has been shown to lower CDI rates, health care–associated infections (HAIs) caused by MDROs, and to reduce overall length of stay and associated costs.^{3,7,8}

CORE ELEMENTS OF ANTIBIOTIC STEWARDSHIP PROGRAMS

Implementing ASPs is challenging, as prescribing practices and patient complexity vary across institutions.³ There is no single format on which to base ASPs, and a one-size-fits-all strategy is not recommended, as institutional requirements differ.³ Defined leadership and a multidisciplinary approach are recommended. Although ASPs likely will differ in terms of resources and activities, the CDC has outlined the following core elements for ASPs (Table 1)³:

- Leadership Commitment: Human, financial, and information technology resources should be allocated to ASPs.
- Accountability: A single leader should be appointed to lead ASPs. Evidence suggests that the presence of an infectious diseases physician is ideal.^{1,9}

Leadership commitment	Allocate human, financial, and information technology resources to antibiotic stewardship programs (ASPs).
Accountability	A single leader should be appointed to lead ASPs. Ideally this would be an infectious diseases–trained physician.
Drug expertise	Appoint a single pharmacist leader to provide drug-related expertise.
Action	Active strategies, such as prior authorization, prospective audit, and feedback, and the use of antibiotic time-outs should be adapted.
Tracking	Antibiotic consumption and resistance patterns should be monitored. Antibiograms should be generated to reflect resistance profiles.
Reporting	Results of antimicrobial use and resistance profiles should be shared with relevant hospital staff members.
Education	Programs should be designed to educate prescribers regarding optimal antibiotic use.

Adapted from Centers for Disease Control and Prevention (CDC). Core elements of hospital antibiotic stewardship programs. Available at: <https://www.cdc.gov/antibiotic-use/healthcare/implementation/core-elements.html>. Accessed April 27, 2018.

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