

Research by Lee Ann Jarousse



ANTIMICROBIAL STEWARDSHIP

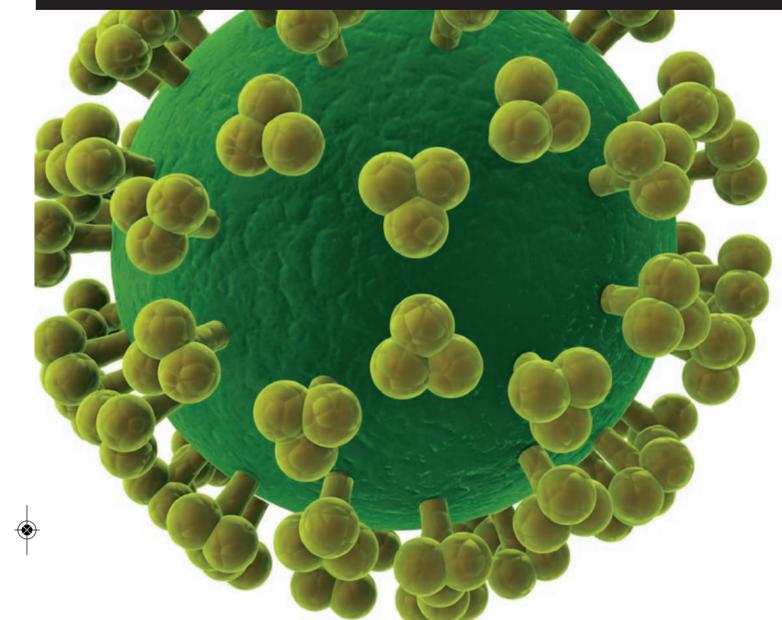
It's Time to Step It Up

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ANTIMICROBIAL STEWARDSHIP



Antimicrobial resistance remains a significant public health issue with serious implications for hospitals. One of the main causes: the misuse of antibiotics. Studies suggest that at least 50 percent of antibiotic use in hospitals is inappropriate. Effective stewardship programs combat that by ensuring the appropriate selection, dose, route and duration of antimicrobial therapy.

"The time for antimicrobial stewardship is now," says Ruth Lynfield, M.D., state epidemiologist and medical director of the Minnesota Department of Health in Saint Paul. "We have pathogens that are resistant to current antibiotics," she says, adding that there are few antibiotics in the research and development pipeline. "We have to treat antibiotics as a precious resource. We don't want to live in a post-antibiotic era," she says.

Antimicrobial stewardship is a critical patient safety imperative, says Julia Moody, clinical manager of infection prevention and control, clinical services group for HCA Inc., Nashville, Tenn. Among other things, the programs have resulted in reduced lengths of stay, morbidity and mortality. The combination of antimicrobial stewardship with a comprehensive infection prevention program has been shown to curb the emergence and transmission of antimicrobial-resistant bacteria.

There's more. In addition to the clinical benefits, antimicrobial stewardship has significant financial rewards, says Russell Olmsted, an epidemiologist in infection control services for Saint Joseph Mercy Health System, Ann Arbor, Mich. "The appropriate use of antibiotics can save the organization money," he says. Antimicrobial stewardship focuses on providing the right antibiotic for the right length of time. That alone will save money. Taking into account the clinical benefits, including a reduction in readmissions from adverse events, the cost savings can be significant.

The place to start is at the top. Antimicrobial stewardship is dependent on senior leadership support to allocate the necessary resources and to raise awareness of its importance throughout the organization. The next step is securing a physician champion who will be able to garner support among the medical staff.

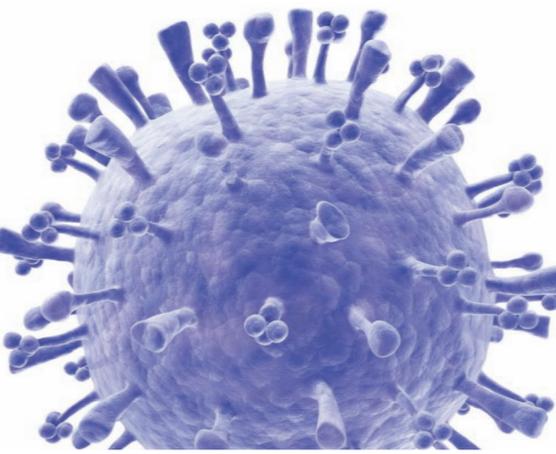
It's important not to overlook the link between antimicrobial stewardship and public health. "From a global perspective, we want to make sure we are making the best use of antibiotics," says Cynthia Reilly, director of practice development for the American Society of Health-System Pharmacists, Bethesda, Md. Antimicrobial stewardship reaps benefits not only for the organization, but also for the community at large, she says.

This gatefold looks at key elements of antimicrobial stewardship programs within hospitals and health systems.

KEY FACTS

- Antimicrobial resistance is a global public health problem. Antimicrobial stewardship, in combination with comprehensive infection prevention, significantly can impact the emergence of antimicrobial-resistant bacteria.
- Misuse of antimicrobials threatens their long-term utility. Curbing inappropriate antimicrobial use is the best way to control resistance, according to the Centers for Disease Control and Prevention.
- Infection prevention and antimicrobial stewardship efforts are succeeding. In 2010, the CDC reported a 33 percent reduction in central line-associated blood stream infections among critical care patients; a 7 percent reduction in catheter-associated urinary tract infections in hospitals; a 10 percent reduction in surgical-site infections; and an 18 percent reduction in health care-associated invasive methicillin-resistant *Staphylococcus aureus*.
- Despite the progress in reducing health care-associated infections, *Clostridium difficile* infections remain high and are attributed to 14,000 American deaths each year, the CDC reports.
- Antimicrobial resistance is associated with longer lengths of stay, increased risk of transfer to the intensive care unit, increased risk of death and increased cost of care.

Sources: Association for Professionals in Infection Control and Epidemiology, CDC, Infectious Diseases Society of America, Society for Healthcare Epidemiology of America, 2012



THE ANTIMICROBIAL STEWARDSHIP TEAM

Antimicrobial stewardship should be a multidisciplinary effort led whenever possible by an infectious diseases physician and a pharmacist trained in infectious diseases. Composition of the antimicrobial stewardship team will vary, depending on workforce availability and the needs within the organization. Lack of personnel with specialized training in infectious diseases should not prevent antimicrobial stewardship activities. This is a look at the stewardship team, along with some of the roles and responsibilities of the various disciplines.



SENIOR LEADERSHIP
To be successful, antimicrobial stewardship programs require significant support from senior leadership. In addition to allocating resources to establish and continue stewardship programs, senior leaders should raise awareness and promote it as being central to patient safety.



INFECTION PREVENTIONISTS AND HOSPITAL EPIDEMIOLOGISTS
These disciplines support the antimicrobial stewardship program through surveillance activities and oversee implementation of evidence-based practices. They also provide actionable data to various stakeholders within the organization and educate staff on the importance of antimicrobial stewardship and on the organization's policy and guidelines.



INFORMATION SYSTEM SPECIALIST
Up-to-date, actionable data are critical. Information services support is necessary to enable data collection and analysis. Clinical guidelines and formularies should be incorporated into the electronic health record and computerized provider order entry system to facilitate compliance.



PHARMACIST
A pharmacist should promote the judicious use of antimicrobials throughout the organization and generate and analyze utilization data. The pharmacist also should assist in formulary development to ensure that the types of antimicrobials available are best suited for the patient population.



INFECTIOUS DISEASES PHYSICIAN
The infectious diseases physician plays a critical role in antimicrobial stewardship. Among other things, the ID physician helps to champion the program and garner support for antimicrobial stewardship activities.



CLINICAL MICROBIOLOGIST
The clinical microbiologist evaluates local resistance trends and provides susceptibility data to optimize antimicrobial management at the individual patient level.

Source: H&HN research, 2012

KEY COMPONENTS OF ANTIMICROBIAL STEWARDSHIP

At its core, antimicrobial stewardship is about the appropriate use of antimicrobials. No two stewardship programs are — or should be — the same. Rather, hospitals should develop programs based on their individual needs as well as local practice patterns. According to guidelines released by the Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America, there are two core strategies of antimicrobial stewardship: prospective audit with feedback and formulary restriction and pre-authorization. Additional supplemental activities are outlined below.

TWO CORE STRATEGIES OF ANTIMICROBIAL STEWARDSHIP

1 PROSPECTIVE AUDIT WITH FEEDBACK
This involves evaluating the appropriateness of an antimicrobial order and providing feedback to the prescriber if an order is inappropriate. The process also provides the opportunity to educate the prescriber on the appropriate therapy, with a goal of reducing the inappropriate use of antibiotics and changing future prescribing habits.

2 FORMULARY RESTRICTION AND PRE-AUTHORIZATION
The formulary restrictions may make some antimicrobials available to treat certain conditions or patient populations. Prescribers must receive pre-authorization before the orders are filled. These restrictions often are put in place following the initial dose to avoid delays in treatment that could impact clinical outcomes.

SUPPLEMENTAL ACTIVITIES

UTILIZATION AND RESISTANCE | Antimicrobial stewardship depends on access to up-to-date data of the organisms and resistance patterns within the organization. Quarterly reports indicating use and prevalence at the unit level can enable important feedback on antibiotic utilization.

EDUCATION | Education is a key component, helping to build a foundation of knowledge about the importance of antimicrobial stewardship and influence prescribing behavior.

GUIDELINES AND CLINICAL PATHWAYS | The use of evidence-based guidelines that reflect local practice and resistance patterns can improve the use of antimicrobials. These guidelines can be incorporated into the electronic medical record and computerized provider order entry system to facilitate compliance.

STREAMLINING AND DE-ESCALATION | This process involves replacing a broad-spectrum antimicrobial to a narrower-spectrum agent when the culture and susceptibility results are available. It also establishes criteria for discontinuing antimicrobials.

ANTIMICROBIAL ORDER FORMS | These forms assist with the antimicrobial use audit and require prescribers to justify their order. Order forms also can be used to implement automatic stop orders to prevent long, excessive therapy.

ANTIMICROBIAL CYCLING | Antimicrobial cycling involves the scheduled substitution of a specific antimicrobial agent or class for another one to prevent antimicrobial resistance. It is unclear whether cycling is effective long-term as a means of preventing or reducing antimicrobial resistance.

DOSE OPTIMIZATION | This intervention improves drug dosing by taking into account individual patient characteristics, such as weight and age, the causative pathogen, site of infection and pharmacokinetic characteristics of the drug.

PARENTERAL-TO-ORAL CONVERSION | The conversion from intravenous to oral antibiotics reduces the risk of complications from IV use and can decrease the length of stay and associated cost.

SURVEILLANCE | Surveillance enables the real-time tracking of antimicrobial resistance, enabling early detection and intervention of resistant strains. Surveillance also enables informed clinical therapy decisions and helps to establish appropriate policies and guidelines related to antimicrobial use.

Source: H&HN research, 2012

FOUR KEY MEASURES

1 OVERALL ANTIBIOTIC USE

One of the main outcomes of an antimicrobial stewardship program should be a reduction in antibiotic use because of a shorter duration of antibiotic treatment, and a decreased need to re-treat patients caused by therapeutic failures. The overall spend on antimicrobials is another key indicator.

2 PREVALENCE OF ANTIMICROBIAL-RESISTANT STRAINS

Appropriate antibiotic use should result in a reduction of antibiotic-resistant organisms such as MRSA and VRE. It's important to note, however, that prevalence of antimicrobial-resistant strains also are affected by environmental factors, as well as prevalence in the community and in other health care settings.

3 LENGTH OF STAY

Length of stay often is shortened due to the decreased need to re-treat patients who failed to respond to treatment in the first place. There also should be a drop in health care-acquired infections.

4 MORBIDITY AND MORTALITY

Morbidity and mortality improve as patients experience enhanced clinical outcomes due to fewer adverse effects from the misuse of antimicrobial agents.

Source: H&HN research, 2012



CASE STUDY: UNIVERSITY OF MARYLAND MEDICAL CENTER, BALTIMORE

The University of Maryland Medical Center launched an antimicrobial stewardship program in 2001, led by an infectious diseases physician and a clinical pharmacist with infectious disease training. "Our costs for antibiotics were going through the roof," says Harold Standiford, M.D., medical director of antimicrobial stewardship.



An antimicrobial monitoring team made daily rounds, overseeing antibiotic use in real time, and providing active intervention and education. Within three years, the organization's antibiotic spending was reduced by \$3 million. After seven years, antibiotic spending was cut in half. Despite the program's success, it was eliminated in 2008, due in part to dissatisfaction among physicians over the pre-authorization requirements. In its place, the organization added additional personnel to provide infectious disease consultations.

Within two years of the program's suspension, antibiotic cost increased by 32 percent (about \$2 million). "Antimicrobial stewardship made sense from a clinical perspective and a financial perspective," says Standiford, noting, however, that the organization did not see an increase in adverse events because of inappropriate antibiotic use following the program's suspension. The organization since has reinstated its antimicrobial stewardship program, with modifications. Physicians do not need pre-authorization for restricted antibiotics. However, if a physician places an order for a restricted antibiotic, the order will be reviewed the following day by the antimicrobial monitoring team. "The first quarter results are good," says Standiford of the new approach, although exact numbers are not available. "We've learned that antimicrobial stewardship seems to benefit from a team approach."

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