



HHS Public Access

Author manuscript

Jt Comm J Qual Patient Saf. Author manuscript; available in PMC 2019 May 01.

Published in final edited form as:

Jt Comm J Qual Patient Saf. 2018 February ; 44(2): 65–67. doi:10.1016/j.jcjq.2017.11.002.

Antibiotic Stewardship Grows Up

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The Joint Commission’s antibiotic stewardship accreditation standard, Medication Management (MM) Standard MM.09.01.01, effective January 1, 2017,^{1,2} is transforming efforts to improve antibiotic use in hospitals in the United States. In 2016 the Centers for Medicare & Medicaid Services proposed a similar requirement in the hospital Conditions of Participation.³ Data supporting the effectiveness of hospital antibiotic stewardship programs (ASPs) have been long-standing and voluminous. Many studies during the past three decades have shown that these programs can improve patient outcomes and reduce antibiotic resistance while saving money at the same time.^{4,5}

The proven benefits of ASPs in addressing the current challenges of *Clostridium difficile* infection and antibiotic resistance prompted the Centers for Disease Control and Prevention (CDC) in 2014 to recommend that all hospitals in the United States implement such a program. That same year, the CDC published *Core Elements of Hospital Antibiotic Stewardship Programs* to support that implementation by outlining structural and functional components associated with effective stewardship programs.⁶

It is encouraging to see that hospitals are responding to this call. The percentage of hospitals reporting implementation of all seven of the CDC’s core elements in the National Healthcare Safety Network annual facility survey increased from 1,715 (41%) of 4,184 hospitals in 2014⁷ to 3,060 (64%) of 4,781 hospitals in 2016 (CDC, unpublished data).

The question is no longer whether or not hospitals should have ASPs but how they can implement those programs most efficiently and effectively. To that end, the article by Kapadia et al., “The Expanding Role of Antimicrobial Stewardship Programs in Hospitals in the United States: Lessons Learned from a Multisite Qualitative Study,” in this issue of *The Joint Commission Journal on Quality and Patient Safety*,⁸ provides some helpful insights. The investigators, who included experts in antibiotic stewardship and qualitative research, conducted semistructured interviews with stewardship program staff in programs recognized as being leaders in the field. Their goal was to identify and “describe the characteristics and innovative strategies of leading [antibiotic stewardship programs].”^{8(p. 68)} The fact that thematic saturation was reached after interviews with just 12 leaders at four hospitals suggests a high degree of consistency in some of the opportunities and challenges being encountered by stewardship programs.

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The ASPs in this study were taking steps to expand the reach of stewardship efforts by engaging more types of frontline providers, particularly pharmacists and noninfectious disease clinicians. This effort to expand the stewardship work-force echoes a highly effective approach that has become foundational in the field of infection prevention. Historically, efforts to prevent health care-associated infections, such as central line-associated bloodstream infections (CLABSIs), were often viewed as the “job” of the infection prevention team. However, in the early 2000s, a pair of landmark studies transformed that approach. These studies implemented CLABSI prevention efforts led by frontline providers with close support from the infection prevention team. The results were unprecedented and dramatic—a more than 50% reduction in CLABSIs.^{9,10} Part of the power of this approach is the transformation of the view of infection prevention as something that someone else does “for you” or “to you” to something that infection prevention staff do “with you.” Ultimately, the goal is to move providers along a spectrum from being “aware of” antibiotic stewardship to being “receptive to” stewardship interventions to being “responsible for” improving antibiotic use.

Leaders at all four of the hospitals in this study are using a similar approach for stewardship. Pharmacists and clinicians have been the initial focus, which makes sense, as these groups are most directly engaged in the prescribing and dispensing of antibiotics. A recent study demonstrated the effectiveness of a multispecialty-developed stewardship intervention for community-acquired pneumonia.¹¹ There is room to expand the stewardship team even more. Initial CLABSI prevention efforts did not engage bedside nurses, largely because they did not insert the central lines. However, nursing engagement was central, for example, to both the Pittsburgh Regional Health Initiative¹² and the Michigan Keystone study.¹³ This seems obvious in retrospect because nurses are present every time a central line is inserted and are thus ideally suited to ensure optimal technique. Likewise, nurses have not been engaged in antibiotic stewardship efforts, as most hospital nurses do not prescribe antibiotics. Yet nurses are present every time an antibiotic is administered and thus seem equally well positioned to support efforts to improve antibiotic use. The CDC is partnering with the American Nurses Association (ANA) to engage nurses in antibiotic stewardship efforts to develop approaches to better engage nurses in antibiotic stewardship efforts.¹⁴ In 2017 the CDC and the ANA issued a white paper that outlines some of the key roles that nurses can play in improving antibiotic use.¹⁵

As Kapadia et al. report, in two of the four hospitals in their study, the ASPs’ communication with frontline providers (that is, antibiotic stewardship recommendations) were also starting to “come out of the shadows.” Because ASPs make recommendations without seeing patients, concerns about liability have historically precluded these recommendations from being part of the permanent medical record. This can limit both the visibility and the perceived importance of the recommendation. It was encouraging to see that these two hospitals were able to work with their legal departments to create a stewardship recommendation note that could be placed in the medical record. This could be the start of a trend. A recent article documented the frequency and seriousness of adverse drug events from unnecessary antibiotics given in hospitals: 20% of patients given an unnecessary antibiotic experienced one or more adverse events, with nearly all events leading to further testing or longer lengths of stay.¹⁶ It is certainly no coincidence that a

2016 analysis of malpractice claims found that antibiotics were one of the most common drugs implicated in malpractice lawsuits.¹⁷ As risk managers become more aware of the proven role that ASPs can play in reducing adverse drug events, perhaps more hospitals will not just permit, but demand, that stewardship recommendations be part of the permanent medical record.

The respondents in the Kapadia et al. study also highlighted the promises and pitfalls of information technology (IT) in enhancing antibiotic stewardship efforts. Although all four hospitals were using various IT solutions and tools to support their ASPs, there was consensus on the need for improvement in this area. Some of the challenges mentioned included the inabilities both to access antibiotic use data in a timely and granular (for example, unit-level) manner and to do benchmarking of use. As Kapadia et al. point out, the Antibiotic Use Option of CDC's National Healthcare Safety Network (NHSN) is a solution to these challenges.¹⁸ The Antibiotic Use Option allows hospitals to electronically report data on antibiotic use, which is combined with admission, discharge, and transfer data to produce rates of antibiotic use at both the hospital and individual unit location. The data are available directly to users in real time, and analytic features in NHSN allow users to perform their own analyses, rather than having to submit requests to other groups. Moreover, the Antibiotic Use Option features a risk-adjusted, benchmark measure of antibiotic use for a variety of antibiotic groupings that stewardship experts have identified as key targets for improvement. This measure, the Standardized Antimicrobial Administration Ratio (SAAR), which entails an observed-to-predicted ratio, was endorsed by the National Quality Forum in 2016.¹⁹

The CDC is engaged in a number of efforts to both support enrollment in the Antibiotic Use Option and refine the SAAR measure. As of September 2017, almost 400 hospitals had successfully submitted data to the Antibiotic Use Option, and the CDC is collaborating with several large health systems to expand enrollment further. In 2016 Missouri passed a law requiring that all nonpsychiatric hospitals create antibiotic stewardship programs and enroll in the Antibiotic Use Option by August 2017,²⁰ and the CDC is working with a number of partners in the state, including the health department, hospital association, and health information exchange, to explore ways to facilitate enrollment. The CDC has also supported work by Kaiser Permanente to assess the risk adjustment of the SAAR, and is now supporting a project by the Duke Antimicrobial Stewardship Outreach Network that is designed to determine how well the SAAR both helps identify targets for stewardship interventions and captures the impact of those interventions.²¹

The new Joint Commission accreditation standard is helping to drive transformational change in antibiotic stewardship. As hospitals work to quickly implement and expand stewardship programs, it will be increasingly important to identify promising approaches and key barriers. The CDC is committed to working with partners to both help identify and disseminate effective strategies and to find ways to overcome barriers. ASPs are growing up, and the key now is to ensure that their growth is sustained and productive.

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