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SPECIAL FEATURES

Outpatient antibiotic stewardship: Interventions and opportunities

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ABSTRACT

Improving the use of antibiotics across the continuum of care is a national priority. Data outlining the misuse of antibiotics in the outpatient setting justify the expansion of antibiotic stewardship programs (ASPs) into this health care setting; however, best practices for outpatient antibiotic stewardship (AS) are not yet defined. In a companion article, we focused on recommendations to overcome challenges related to the implementation of an outpatient ASP (e.g., building the AS team and defining program metrics). In this document, we outline AS interventions that have demonstrated success and highlight opportunities to enhance AS in the outpatient arena. This article summarizes examples of point-of-care testing, policies and interventions, and education strategies to improve antibiotic use that can be used in the outpatient setting.

One of the first hospital antibiotic stewardship programs (ASPs) in the United States was initiated in the late 1970s, when a team of infectious diseases physicians and pharmacists implemented a prospective audit and feedback strategy at Hartford Hospital in Connecticut.[1] Since that time, ASPs have been formally defined[2] and have produced mounting evidence that the use of interventions in acute care results in judicious prescribing and improvement in patient outcomes.[3] Antibiotic overuse and misuse is not unique to the hospital setting, and recent federal policy provides the impetus to implement ASPs across all health care settings. In recognition of the need to expand the fight against drug-resistant pathogens, the White House issued Executive Order 13676: Combating Antibiotic-Resistant Bacteria in September 2014.[4] One facet of the order was the call for defining and establishing antibiotic stewardship (AS) across the continuum of care, including, but not limited to, office-based practices and outpatient settings.[4] In response to the executive order, the National Strategy and National Action Plan for Combating Antibiotic-Resistant Bacteria were published in 2014 and 2015, respectively.[5,6] These documents were intended to serve as a roadmap for meeting the challenge presented by antibiotic-resistant bacteria. The action plan outlined numerous objectives and milestones aimed at increasing outpatient AS (Table 1).[5]

Presently, there is limited guidance available for AS teams that are forming or expanding into the outpatient practice setting. The factors that drive antibiotic misuse or overprescribing in the outpatient setting may be different from those in the hospital, including perceived patient and parent or caregiver expectations for antibiotics, diagnostic uncertainty, prescriber time pressures, and patient satisfaction.[7] To address these unique circumstances, stewardship interventions that have been suggested to improve outpatient antibiotic prescribing patterns differ somewhat from those in the inpatient setting. Optimal intervention components are difficult to identify given the paucity of comparable data in this setting; however, experts agree that a multifaceted approach is necessary to improve antibiotic use.[8-10] The Centers for Disease Control and Prevention (CDC) recently released the *Core Elements of Outpatient Antibiotic Stewardship* in an attempt to consolidate evidence-based practices and adapt best practices across other clinical settings.[11] When planning a new outpatient AS initiative, the AS team should select

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Table 1
Objectives and select milestones outlined in the National Action Plan for Combating Antibiotic-Resistant Bacteria specific to outpatient antibiotic stewardship[5]

- **Sub-Objective 1.1.1A:** Strengthen antibiotic stewardship in inpatient, outpatient, and long-term care settings by expanding existing programs, developing new ones, and monitoring progress and efficacy.
  - Within 3 years:
    - The Centers for Disease Control and Prevention (CDC), Centers for Medicare and Medicaid Services (CMS), the Agency for Healthcare Research and Quality, and other partners will issue guidance on antibiotic stewardship and best practices for ambulatory surgery centers, dialysis centers, nursing homes, other long-term care facilities, doctors' offices and other outpatient settings, pharmacies, emergency departments, and medical departments at correctional facilities.
- **Sub-Objective 1.1.1B:** Strengthen educational programs that inform physicians, veterinarians, members of the agricultural industry, and the public about good antibiotic stewardship.
  - Within 3 years:
    - CMS will expand the Physician Quality Reporting System (PQRS) to include quality measures that discourage inappropriate antibiotic use to treat non-bacterial infections, such as respiratory tract infections.
- **Sub-Objective 1.1.3:** Implement annual reporting of antibiotic use in inpatient and outpatient settings and identify geographic variations or variations at the provider or patient level that can help to guide interventions.
  - Within 1 year:
    - CDC will report outpatient prescribing rates for 2011 and 2012 and use the data to target and prioritize intervention efforts.
    - CDC will establish a benchmark (in terms of prescriptions per population) for reduction in antibiotic use.
  - Within 3 years:
    - Starting in 2016, CDC will issue yearly reports on progress in meeting the national target of 50% reduction in inappropriate use of antibiotics in outpatient settings, as well as on overall trends in antibiotic prescribing.
    - The U.S. Department of Defense (DOD) will establish goals for reducing antibiotic use in DOD facilities that provide outpatient care for military personnel and their families.
    - DOD will centralize reporting of outpatient antibiotic use and issue annual summary reports.
- **Sub-Objective 2.1.1:** Create a regional public health laboratory network that uses standardized testing platforms to expand the availability of reference testing services, characterize emerging resistance patterns and bacterial strains obtained from outbreaks and other sources, and facilitate rapid data analysis and dissemination of information.
- **Sub-Objective 2.1.2:** Link data generated by the regional public health laboratory network to existing public health surveillance networks so that antibiotic susceptibility testing data are immediately available to local, state, and federal public health authorities as they detect and investigate outbreaks, and to veterinary diagnostic and food safety laboratory databases and surveillance systems, as needed.
- **Sub-Objective 2.2.1:** Enhance reporting infrastructure and provide incentives for reporting (e.g., require reporting of antibiotic-resistance data to National Healthcare Safety Network as part of the CMS Hospital Inpatient Quality Reporting Program).
- **Sub-Objective 2.2.2:** Add electronic reporting of antibiotic use and resistance data in a standard file format to the Stage 3 Meaningful Use certification program for electronic health record systems.
- **Sub-Objective 2.2.3:** Expand the activities and scope of the Emerging Infections Program to include monitoring of additional urgent and serious bacterial threats and evaluating at-risk populations across community and health care settings.
- **Objective 3.1:** Develop and validate new diagnostics—including tests that rapidly distinguish between viral and bacterial pathogens and tests that detect antibiotic-resistance—that can be implemented in a wide range of settings.
- **Objective 3.2:** Expand the availability and use of diagnostics to improve treatment of antibiotic-resistant bacteria, enhance infection control, and facilitate outbreak detection and response in health care and community settings.

interventions and education strategies that will be practical and effective for achieving established ASP objectives.

This article describes evidence-based opportunities and interventions for developing and expanding AS initiatives into the outpatient practice setting. For the purposes of this article, the outpatient practice setting will encompass ambulatory care clinics, physician offices, convenient care clinics, urgent care clinics, and community pharmacies. Although emergency departments, nursing homes, and long-term care facilities may be considered outpatient practice sites and some of the concepts discussed herein may be applicable to these settings, these venues also offer unique opportunities and present challenges that may not be addressed.

Identifying stewardship targets

Traditionally, AS initiatives have tended to focus on activities under a limited organizational umbrella. However, collaboration among clinics, health systems, laboratories, public health, community pharmacies, and other stakeholders may optimize an outpatient AS program and provide new models for achieving outpatient AS objectives. Although outpatient ASPs could certainly have a focus within a particular health system, they have the potential to reach much further. To realize their full potential, outpatient ASPs should strive to engage a broader cohort of partners, including clinics, community pharmacies, and hospitals. Furthermore, outpatient AS initiatives can take on numerous forms; however, at the most basic level, all interventions are designed to affect a process on the patient-infection continuum (Table 2).[12]

When implementing a new AS initiative or expanding an existing ASP, the AS team should perform an evidence-based assessment of antibiotic prescribing for infectious diseases syndromes and identify barriers to optimal management across the patient-infection continuum. This exercise will aid in identifying areas of opportunity for AS initiatives and prioritizing interventions. Once priorities and opportunities have been recognized, AS strategies that have documented success in improving antibiotic overprescribing should be implemented (Table 3).[10,13] ASP leaders will need to discern the elements of ASPs that are both critical to the success of the AS initiative, but also feasible in the diverse outpatient setting. Most data in the outpatient arena evaluate interventions to curb unnecessary prescribing for acute respiratory tract infections (RTIs), and this infectious syndrome has been an obvious and critical target for intervention given the documented gross overuse of antibiotics to treat acute bronchitis and other RTIs that are primarily viral in nature.[14]