Preface

An Overview of Antimicrobial Stewardship Programs: Imperatives, Interventions, and Innovations

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Editor

Antibiotic Stewardship or Antimicrobial Stewardship Programs (ASPs) are The Joint Commission (TJC) mandated to optimize antibiotic use in the hospital. Before ASPs were formally created, infectious disease (ID) clinicians were the stewards of antibiotic therapy. ID clinicians continue to be the leaders and advocates of optimal antibiotic use. Effective ASPs require a multidisciplinary coordinated approach led by a dynamic ID clinician team leader supported by a staff of ID-trained clinical PharmDs and IT personnel. Also vital is close cooperation of the microbiology laboratory and infection control and hospital epidemiology.

The ID clinician team leader should possess the requisite interpersonal, diplomatic, and leadership skills key to directing a successful ASP tailored to the institution’s particular ASP problems. ASPs have their own imperatives in defining objectives and developing effective interventions. ASP interventions should be customized and prioritized to the hospital’s needs. Successful early ASP efforts demonstrate effectiveness and gives confidence to administration and medical staff, which paves the way for further future ASP measures. The effectiveness of ASP interventions is best assessed by prospective audits, which guide the ASP leadership team to refine or redirect specific interventions as well as support new innovative approaches to specific ASP problem areas.

While ASP are mandated, to be maximally effective, ASPs require substantial and ongoing financial commitment from the hospital’s administration. ASP is a wise hospital investment since various ASP measures will save the hospital money.
(eg, decreased drug costs, fewer adverse drug effects, decreased Clostridium difficile, decreased MDROs [Multi-drug Resistant Organisms]). Further savings come from optimal antibiotic dosing and shorter duration of therapy. The greatest cost-savings come from robust IV-to-PO switch programs, which decrease phlebitis, reduce central line–associated infections, decrease length of stay, and provide earlier discharge. The savings from IV-to-PO switch programs offset the costs of ASPs. The next step after successful IV-to-PO efforts is entirely PO antibiotic therapy, which has even more clinical and economic advantages than IV-to-PO switch programs.

Ultimately, ASP acceptance and success depend on medical staff support. The ID clinician ASP Director and Clinical ID-trained PharmD support team are critical in providing medical education on optimal antibiotic use to practitioners. Key ASP concepts can be reinforced by case consultations. Common ASP problem areas are determining appropriate spectrum by infection site, differentiating colonization (no treatment) from infection, avoiding polypharmacy when well-selected monotherapy is adequate, avoiding treating “fever and leukocytosis” as well as noninfectious febrile disorders or viral infections. The manifest advantages of IV-to-PO switch programs are impressive from an ASP perspective.

While IV-to-PO switch programs are often regarded as the “low hanging fruit” of ASPs, there are two areas that are most difficult to control (ie, antibiotic resistance problems [MDROs], C difficile). Controlling MDROs and C difficile is difficult because the factors responsible for their presence are not completely understood, making interventions particularly problematic. In some hospitals, Klebsiella pneumoniae carbapenemase (KPC) resistance seems to be related to the volume of carbapenem use, while in other hospitals, high rates of carbapenem use has had no effect on KPC rates. To further complicate the analysis, the MDRO potential varies among the carbapenems (ie, all carbapenems are not alike with respect to resistance potential). Not to mention, many MDROs isolated in hospital originate from the community (eg, chronic care facilities). Similarly, all the determinants of C difficile toxin production are unknown, and not simply related to antibiotic tonnage. Furthermore, antibiotics differ in their C difficile potential and which antibiotic is chosen matters quite a bit. Some antibiotics are protective against C difficile (eg, doxycycline, tigecycline). Importantly, there are a variety of non–antibiotic medications that may cause C difficile diarrhea (eg, proton pump inhibitors). Also needed to be considered is patient- or fomite-to-person spread.

In summary, prudent antibiotic use is the main ASP imperative. Implied in the ASP imperative are the following: monotherapy is preferred, use the shortest duration of therapy to effect cure, use optimal dose/dosing intervals to optimize PK/PD properties, do not treat fevers due to nonbacterial infections, use PO entirely whenever possible or at least IV-to-PO switch most of the time. ASP success requires enthusiastic medical staff support and antibiotic education. ASP consultations on a case-by-case basis reinforce ASP principles daily. Confidence is gained by the staff over time in experiencing firsthand the effectiveness of ASP interventions. The most challenging ASP problems (eg, MDROs and C difficile) will require novel innovations.

This issue of Medical Clinics of North America is intended for medical practitioners. The success of any ASP depends on the understanding, and enthusiastic support of the medical staff is essential. The articles in this issue were written by
experts in their fields. Readers will benefit from their experience in the various aspects of ASPs. It is hoped that practitioners will find these articles of interest and practical use.

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