Role of the Pharmacist in Antimicrobial Stewardship

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It is well documented in the primary Antimicrobial Stewardship literature that a multidisciplinary team is an essential element to having a successful program. The Centers for Disease Control (CDC) and the Infectious Diseases Society of America (IDSA) offer excellent guidelines for implementation and recommendations for key members of an Antimicrobial Stewardship Team (AST). The guidelines highlight the interdisciplinary nature of Antimicrobial Stewardship teams, noting that each member has a unique area of expertise and background knowledge base that strengthens the team beyond individual members.[1,2] These guidelines have existed for more than a decade. Time has passed and technology has advanced since the guidelines were first developed, and the roles of the members of the AST have changed from their initially described roles of years ago.

The role of pharmacists in particular has been expanded in the past several years. Early versions of the stewardship guidance documents had pharmacists playing a narrow role as the medication expert, with the recommendation that clinical questions or therapy guidance be handled by physicians.[3]

Numerous specialized pharmacy post-graduate residency programs, stewardship training certificate programs and additional certification exams are now available for pharmacists seeking to gain a greater knowledgebase in infectious diseases and antimicrobial stewardship.[4] Additional post-graduate certifications and training are recommended by the IDSA guidelines as a best practice for a lead stewardship pharmacist.[2]

Each of the individual elements of stewardship can be enhanced with a pharmacist's assistance. The American Society of Health-Systems Pharmacists (ASHP) highlights areas where pharmacists are uniquely positioned to provide contributions to ASP programs.[4] Each of the elements of stewardship are explored in greater detail below.

PROSPECTIVE AUDIT AND FEEDBACK

Prospective audit with direct intervention and feedback is one of the two main core strategies employed by AST programs.[1,2] It allows for providers to make their own treatment decisions, but supplemented with input from the AST. It is thought that the education provided in these encounters may not only reduce inappropriate use for an individual patient, but the increase in knowledge can be applied to similar future encounters, thus decreasing the burden of inappropriate antimicrobial use.[3] The pharmacists are uniquely situated to intervene using prospective audits, as their workflow includes chart review for appropriateness and indication when approving inpatient orders, filling outpatient prescriptions, or doing medication reconciliation as part of their daily activities in their practice site. Pharmacists can promote optimal use of antimicrobials through individualized patient dosing when intervening on medication issues.[4]

FORMULARY RESTRICTION AND PREAUTHORIZATION REQUIREMENTS

The second core strategy of many AST programs includes formulary restriction and preauthorization of selected antimicrobials.[1,2] These interventions may lead to immediate reductions in use and the costs associated with these selected antimicrobials. Restrictions, additions, deletions to Formulary in the inpatient setting, development of drug therapy and disease state guidelines or pathways for appropriate use of antimicrobials are generally handled as part of the duties of the Pharmacy and Therapeutics (P&T) Committee.[3] All of these interventions are important components to promote optimal antimicrobial use. Pharmacist involvement for shepherding stewardship initiatives is vital to achieve the needed buy-in from members of the P&T Committee who may not have a level of comfort or understanding of the elements of stewardship.

The literature cites as supporting evidence of Formulary restriction, a study published by Gross, et al, focused on the clinical and economical outcomes of their stewardship program.[5] They highlighted that their stewardship team consisting of a clinical pharmacist and an infectious diseases attending physician who reviewed requests for restricted antimicrobials was "more effective than an off-hours approval by infectious diseases fellows in recommendation appropriateness (87% vs 47%; $P < .001$), cure rate (64% vs 42%; $P = .007$), and treatment failures (15% vs 28%; $P = .03$)."[5]

EDUCATION

Education targeting patients and the general public about antimicrobial stewardship is an important piece in the stewardship armamentarium to combat inappropriate use.[4] In

a recent Gallup poll, pharmacists were noted to be ranked among the most honest and ethical professionals.[6] They were ranked second, with a 67% rating of "high" or "very high" ethical standards, second only to nurses in a survey of which 1028 US residents responded.[6] In an era where misinformation is rampant, and dissemination of factual information is imperative, pharmacists fulfill an important role in the community to provide unbiased and scientifically accurate information to their patients. Noting the importance of community education, the CDC has created educational literature as part of the Get Smart about Antibiotics campaign that is specifically designed for use in community pharmacy practice.[7] The CDC's recently released Core Elements of Outpatient Antimicrobial Stewardship again highlights the importance and impact of pharmacist involvement for a successful stewardship program.[4]

PHARMACY-DRIVEN INTERVENTIONS

Automatic IV to oral substitution for selected antimicrobials with excellent oral bioavailability is an intervention that is commonly cited in the stewardship literature as having a positive impact on not only use of antimicrobials, but also a reduction in harm and costs associated with intravenous administration of antimicrobials.[1,2] For many disease states, an oral option is not only safe and effective, but it is highly appropriate. Antimicrobials such as fluoroquinolones, linezolid, and fluconazole are excellent targets for and automatic substitution protocol completed by a pharmacist.[1] Protocols containing these drugs and others are well described in the literature and are associated with decreased length of stay, reduced treatment complications and increase cost savings. Additional pharmacist-driven initiatives include; individualized dose adjustments for patients with organ dysfunction (e.g. renal or hepatic adjustment), dose optimization based on therapeutic drug monitoring, and detection and prevention of antibiotic-related drug-drug interactions.[4] Pharmacists may also help with drug selection to avoid unnecessarily duplicative therapy in patients simultaneously receiving multiple agents, or suggesting alternatives when a desired medication may be unavailable due to drug shortage.[3] Use of automated alerts to highlight situations such as duplicate therapies with overlapping spectra can be reviewed and actioned on by a trained pharmacist, thus allowing higher acuity interventions to be assessed by the infectious diseases physician.[4] Time-sensitive indications, especially antibiotics administered for surgical prophylaxis can be monitored for discontinuation by pharmacists.[4]

REGULATORY COMPLIANCE

The elements of performance for the Joint Commission (TJC) Medication Management Standard for Antimicrobial Stewardship prescribe that a pharmacist be included on an AST.[8] Pharmacy involvement helps to ensure compliance with the standards set by various regulatory agencies, not limited to TJC and Centers for Medicare and Medicaid Services (CMS).[4] In addition to compliance, collection and evaluation of antimicrobial utilization data is vitally important for assessing the impact of your stewardship interventions.[1-4] The data associated with length of therapy and tonnage of antimicrobials used resides with the Pharmacy department. Working closely with pharmacists to review use patterns and report metrics on use will be at the forefront as mandatory reporting of antimicrobial use to the National Health-Safety Network (NHSN) by inpatient stewardship programs is anticipated by the end of 2018.

The role of the pharmacist in an individual AST will vary based upon the structure and needs of the individual organization.[2,3] However, the guidance on stewardship from IDSA, CDC, SHEA, ASHP and other key stakeholders makes it abundantly clear that a pharmacist is a resource that is vital to the success of any antimicrobial stewardship team.[1-4] As antimicrobials become an increasingly scarce resource, it will be imperative to have the input from our pharmacy professionals to guide us in these increasingly challenging times.

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