



INDIAN HEALTH SERVICE
National Pharmacy and Therapeutics Committee
Formulary Brief: Antimicrobial Stewardship
-August 2023-



Background:

As the most recent installment of its Best Practices in Formulary Management series, the Indian Health Service (IHS) National Pharmacy and Therapeutics Committee (NPTC) hosted a clinical review of Antimicrobial Stewardship. This marks the third review of this topic for the NPTC, with prior reviews in [2021](#) and [2015](#). Guidance from the U.S. Centers for Disease Control and Prevention (CDC), The Joint Commission, and several IHS facility antimicrobial stewardship protocols was highlighted. Following clinical review, the NPTC **made no modifications** to the National Core Formulary.

Discussion:

Antimicrobial Stewardship Programs (ASPs) play a critical role in enhancing patient care and combating antimicrobial resistance. By decreasing inappropriate antimicrobial use, ASP efforts lead to improved quality of care and reduced secondary infections such as *Clostridium difficile*. Regulatory bodies, accreditation agencies, and quality improvement groups support ASP initiatives.¹⁻² Between 2014 and 2019, the proportion of hospitals meeting all seven [CDC Core Elements](#) rose significantly from 41% to 89%. In 2021, the CDC identified priorities for six of the seven Core Elements. Formulary management can help fulfill the requirements of the fourth Core Element, “[Action](#)”, by providing disease and facility specific treatment guidelines and enacting restrictions to facilitate prospective audits and/or preauthorization related to antibiotic prescribing.¹

Formulary management is essential to meeting The Joint Commission (TJC) antimicrobial stewardship requirements. TJC requires that ASPs implement preauthorization for antibiotics, also known as restrictions, and/or prospective review and feedback of antibiotic prescribing practices. Additionally, TJC requires that ASPs implement at least two evidenced-based guidelines to improve antibiotic prescribing. Examples include, but are not limited to, community acquired pneumonia, urinary tract infections, skin and soft tissue infections, *clostridium difficile* infection, asymptomatic bacteriuria, parental to oral antibiotic conversion, and surgical prophylactic antibiotics.²

Institution-specific guidelines³ provide a standardized approach to prescribing practices, allowing for better adherence, education, and improved patient outcomes. These guidelines adapt to local formulary availability, ensuring optimal use of antibiotics. Prior authorization, often combined with other interventions, controls restricted drug use, although potential delays and reduced prescriber autonomy should be managed. The [AWaRe Classification](#) categorizes 258 antibiotics based on their impact on antimicrobial resistance and appropriateness, aiding monitoring, setting targets, and evaluating stewardship policies. Categories are Access, Watch, and Reserve. Antibiotics in the Access category are often considered first- or second-line options and include medications such as amoxicillin, doxycycline, and nitrofurantoin. Watch group antibiotics are specifically identified as potential targets of antibiotic stewardship efforts and monitoring. Examples of medication classes in this group include fluoroquinolones, carbapenems, and second generation cephalosporins. Lastly, Reserve medications should be considered medications of last resort and include antibiotics such as daptomycin, linezolid, and tigecycline. These categories are used in stewardship efforts to develop institution specific guidelines and to focus monitoring and antibiotic utilization-reporting.⁴

Providing guidance on the antibiotic treatment duration can be a helpful tool in limiting antibiotic exposure. Antibiotics should be prescribed for the shortest duration possible while still adequately treating the infection. Examples of potential opportunities to limit antibiotic treatment duration include 5-day treatment for community acquired pneumonia and 5-day treatment for skin and soft tissue infections.⁵

Addressing common formulary management challenges requires improved data collection, analysis, feedback mechanisms, and regular reviews. ASP provider efforts include dose optimization, formulary restriction, guideline development, and feedback mechanisms.⁶⁻⁷

The relationship between antimicrobial use and *Clostridium difficile* infection (CDI) is complex. While restrictions may reduce CDI cases, antimicrobial resistance could rise, highlighting the challenge of balancing benefits.⁸ Similarly, community-acquired Methicillin-resistant Staphylococcus aureus (MRSA) strains challenge hospital-based formulary restrictions. Restricting antimicrobial classes may limit treatment options for serious infections in the context of hospital-based formulary restrictions. A more reasonable approach to combat community-acquired MRSA is restricting certain antibiotic classes in the ambulatory care setting.⁹

Constant vigilance is crucial to the success of ASPs. The COVID-19 pandemic caused a setback in antimicrobial stewardship progress. From March 2020 to October 2020, approximately 80% of patients hospitalized with COVID-19 also received an antibiotic. In 2020, deaths due to antimicrobial-resistant infections increased 15% in hospitals compared to 2019. The CDC asserts “setbacks to fighting antimicrobial resistance can and must be temporary.”¹⁰

Examples of ASP projects include implementing protocols, such as restricting inappropriate fluoroquinolone usage, which can significantly reduce antimicrobial utilization without compromising patient outcomes.⁹ Audit and feedback interventions, as demonstrated in a study on acute bronchitis, successfully reduce inappropriate antibiotic prescribing by 15% (95% CI: -5 to -24%; $p \leq 0.01$).¹¹ Another study demonstrated decreased resistance of specific gram-negative bacteria to fluoroquinolones and piperacillin-tazobactam after 6 years of implemented restrictions (23% decreased resistance to fluoroquinolones [OR=0.77, 95% CI: 0.62-0.97]; 19% decreased resistance to piperacillin-tazobactam [OR=0.81, 95% CI: 0.72-0.92]).¹²

Findings:

Optimizing formulary management is crucial for successful antimicrobial stewardship. By combining evidence-based guidelines, prior authorization, and targeted interventions, healthcare institutions can achieve better patient outcomes, decrease resistance, and improve overall antibiotic use. Continuous evaluation and adaptation of strategies remains essential in the ever-evolving landscape of antimicrobial stewardship. Visit the [IHS Antimicrobial Stewardship Program](#) website for additional antimicrobial resources, recorded webinars, and to join the ASP listserv.

If you have any questions regarding this document, please contact the NPTC at IHSNPTC1@ihs.gov. For more information about the NPTC, please visit the [NPTC website](#).

References:

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