PIONEERING DIAGNOSTICS


# LEARNING LOUNGE EXCLUSIVE : A PHARMACIST'S PERSPECTIVE ON UTIs AND ANTIMICROBIAL STEWARDSHIP

## Viewpoints Series: Tiffany Bias, PharmD, BCPS, BCIDP, AAHIVP

*With American Pharmacist's Month taking place in October and World Antimicrobial Awareness Week on the horizon for November, we saw the perfect opportunity to hear from Tiffany Bias, PharmD, about the challenges of treating UTIs while maintaining holistic patient health and reducing the spread of resistant bacteria. Bias is the director of antimicrobial stewardship for the eastern US at bioMérieux and previously held an adjunct faculty member position at Drexel University and practiced at several US hospitals in the northeast.*

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**bioMérieux: What are some of the challenges with appropriate diagnosis of UTIs (urinary tract infections)?**

**Bias:** Proper UTI diagnosis remains a clinical conundrum for practitioners and thus has the downstream effect of promoting unnecessary antimicrobial exposure. For patients with localized genitourinary symptomatology in combination with fever and leukocytosis, the diagnosis is generally straightforward and relies on the recovery of uropathogens in culture.

However, for patients who present with abnormal genitourinary tracts or limited cognitive ability, diagnosing UTIs becomes more difficult and may require the use of scoring tools. Asymptomatic bacteriuria is frequently mistaken for a true diagnosis of a UTI. There is a high incidence of asymptomatic bacteriuria in the geriatric population, especially those residing in long-term care facilities as well as those with indwelling urinary catheters.

Moreover, urine cultures remain the gold standard for laboratories despite the high rates of contamination occurring at the time of collection. Some institutions report urine contamination rates above 40%. All of these challenges, coupled with the lack of definitive diagnostic criteria, highlights the need for diagnostic stewardship interventions to reduce UTI over-diagnosis and halt inappropriate antimicrobial prescribing.

**bioMérieux: What are the risks of prescribing a broad-spectrum antimicrobial to treat a UTI versus something more narrowly tailored?**

**Bias:** Exposing patients to anti-infectives, especially those with a broad spectrum of activity, is not a benign intervention and can pose significant risks to the recipient and society as a whole. Selecting therapy that is not narrowly tailored to the infection type has the potential to lead to increased C. difficile infections, adverse drug events such as nephrotoxicity and hepatotoxicity, and the spread of bacterial resistance.

Overutilization of broad-spectrum agents can also raise medical costs due to re-hospitalizations and prolonged lengths of stay. Antimicrobial stewardship interventions are critical in both inpatient and outpatient settings to ensure timely and appropriate empirical antimicrobial therapy based on diagnostic information.

**bioMérieux: What key factors should pharmacists consider when treating complicated versus uncomplicated UTIs?**

**Bias:** Critical factors to consider include instrumentation, immunocompromised states due to transplantation or malignancy, anatomical genitourinary abnormalities, a history of MDR (multi-drug resistance), treatment failures, and impaired renal function. Complicated UTIs (cUTIs) tend to have a higher propensity for treatment failure, leading to extended antibiotic courses and additional patient workup. Obtaining a diagnosis within 48 hours is critical to the success of managing cUTIs. It's also prudent to identify and address predisposing factors for infection and correct them when possible. This may include managing glycemic control, avoiding nephrotoxic agents, and optimizing immunosuppression.

**bioMérieux: How have you seen the increase in Gram-negative antimicrobial resistance affect both UTI cases and healthcare facilities in general?**

**Bias:** After practicing in the northeast over the last decade, I have personally seen the increased prevalence of multidrug-resistant Enterobacterales (MDR-E) and the substantial economic burden it poses on the healthcare system due to higher rates of morbidity and mortality. There have been scenarios where all anti-infective options on the market are ineffective, and clinicians must use unconventional antimicrobial combinations or apply for investigational use of agents in development.

This alarming level of antimicrobial resistance developing in UTI pathogens can be traced to the indiscriminate and widespread overuse of antibiotics. Given the complexities of resistant infections coupled with diminishing treatment modalities, leveraging rapid diagnostic tools is critical to ensure timely and effective patient therapy.

Given that the primary pathogens responsible for both complicated and uncomplicated UTIs include E. coli and Klebsiella pneumoniae, practitioners have been inundated with clinical cases where these uropathogens are expressing beta-lactamases from all four molecular classes. Extended spectrum beta-lactamases, enzymes that hydrolyze third and fourth generation cephalosporins but not carbapenems, are by far one of the common mechanisms of resistance seen when treating UTIs and are classified as a serious threat by the CDC.[1] Furthermore, the presence of carbapenemases, enzymes that hydrolyze carbapenems, continues to rise and remains of particular concern in patients with indwelling urinary catheters.

**bioMérieux: In your opinion, has there been enough clinical evidence to support shifting toward shorter antibiotic courses for some UTIs, or are pharmacists continuing to prescribe long antibiotic courses in most cases?**

**Bias:** UTIs are typically the first target for antimicrobial stewardship programs across the United States, given the abundance of evidence supporting shortened durations of therapy and avoidance of treatment in asymptomatic bacteriuria cases. To date, randomized control trials support the use of 5 to 7 days of antimicrobial therapy for a complicated UTI instead of 10 to 14 days.[2] Some cases of urosepsis with a resistant pathogen may require a longer therapy, but newer data continues to point toward a "less is better" approach.

**bioMérieux: What advantages do clinical diagnostics provide pharmacists who are treating patients with UTIs or other bacterial infections?**

**Bias:** Pharmacists rely on diagnostics for screening, early detection, disease prognosis, therapeutic decisions, and treatment monitoring. As resistance grows, rapid diagnostics allow pharmacists to escalate therapy quickly and improve patient care and outcomes. For UTIs specifically, results from an urinalysis, urine culture, multiplex PCR and/or antimicrobial susceptibility panel offer pharmacists the information necessary to help decrease overutilization of anti-infectives, shorten the severity of infections, and reduce prolonged hospital stays.

In my opinion, diagnostics are at the heart of infectious diseases. Without them, clinicians are powerless. Identifying the causative pathogen is a critical step in the clinical course, allowing pharmacists to select appropriate anti-infective therapy. Diagnostics have high medical and economic impact as the information they provide is critical for making evidence-based decisions.

**bioMérieux: What one thing would you encourage a pharmacist to do today to maximize their antimicrobial stewardship program (ASP) while ensuring safety for patients with UTIs?**

**Bias:** Antimicrobial stewardship strategies are oftentimes focused on optimizing antimicrobial use after initiation. I would encourage pharmacists to implement diagnostic stewardship strategies that work upstream in the clinical decision-making process. Diagnostic stewardship initiatives for UTI can include the following: reflexive urine culture policies, EHR clinical indication requirements and hard stops, campaigns for specimen collection devices, restrictive reporting of results, and suppression of antimicrobials. Diagnostic stewardship efforts and antimicrobial stewardship strategies should work synergistically to maximize the clinical benefits for patients and overall healthcare.

**References**


1. Centers for Disease Control and Prevention. Core Elements of Hospital Antibiotic Stewardship Programs, 2019.
2. Centers for Disease Control and Prevention. Antibiotic Use in the United States, 2018 Update: Progress and Opportunities. U.S. Department of Health and Human Services, 2019.

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