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**Purpose/Background:** The emergency department (ED) is a frequent site of broad-spectrum antibiotic use leading to antibiotic resistance and unwanted sided effects. The last Infectious Disease Society of America (IDSA) guidelines for Urinary Tract Infections (UTIs) were published in 2011. Since 2011, E. Coli resistance has globally and locally increased. Given the rising resistance patterns and risk of adverse events, pharmacists provide an avenue for education and streamlining antibiotic choices based on local culture data.

**Objective:** This study aimed to determine if prevalence of optimal antibiotic prescribing for UTIs increased after education provided by pharmacists.

**Methods:** This was an Institution Review Board approved, retrospective, chart review, pre-post study within a community teaching hospital. Patients were included if they were seen at an ED within our healthcare system, were at least 18 years of age, diagnosed with uncomplicated cystitis, complicated cystitis, or pyelonephritis, and received a prescription for an antibiotic. Patients were excluded if they were diagnosed with a UTI within the previous 30 days, were diagnosed with a catheter-associated UTI or complicated pyelonephritis, were being treated for a concomitant infection, taking immunosuppressive agents, or were pregnant. The pre-analysis evaluated the prevalence of optimal antibiotic prescribing prior to education and included patients seen from November 2018 to January 2019. The post-analysis evaluated the prevalence of optimal antibiotic prescribing after education and included patients seen from November 2019 to January 2020. Education was provided by pharmacists to ED providers regarding local antibiotic resistance patterns and recommended treatment regimens. The primary outcome was the prevalence of optimal antibiotic prescribing, defined as an appropriate agent, dose, and duration, before and after education took place. Suboptimal antibiotic prescribing was defined as antibiotic coverage too broad, dose too high, duration too long, documented non life-threatening allergy to antibiotic prescribed, and treatment of pyelonephritis with cefdinir without a one-time dose of ceftriaxone. Inadequate therapy was defined as prescribing an antibiotic with local resistance >20%, underdosed antibiotic, duration too short, documented life-threatening allergy to antibiotic prescribed, documented prior resistance to antibiotic prescribed, the use of nitrofurantoin or fosfomycin for pyelonephritis, or the use of nitrofurantoin in patients older than 65.

**Results:** Baseline characteristics were similar among both groups. Optimal antibiotic prescribing occurred in 19.7% of patients in the pre-analysis group and 39.7% in the post-analysis group (p < 0.001). There was also a significant increase in suboptimal antibiotic prescribing (27.9% vs. 45.7%; p < 0.001) and a significant decrease in inadequate prescribing (52.2% vs 14.7%; p < 0.001). For secondary outcomes, 6% of patients had a repeat encounter for urinary symptoms within 72 hours in the pre-analysis compared with 0.5% in the post analysis (p = 0.008). The significant decrease in treatment failure seen at 72 hours was continued at 30 days (17% vs 9%; p = 0.03). There was no difference seen in adverse events between groups.
Conclusion: This study demonstrated that education provided by pharmacists was associated with an increase in the prevalence of optimal antibiotic prescribing and a decrease in the incidence of return visits to the emergency department for urinary symptoms at 72 hours and 30 days. These results align with a previous study that showed pharmacist education increased antibiotic prescribing consistent with treatment recommendations.³

References: