

Title: Assessment of emergency department prescribing practices for outpatient treatment of urinary tract infection, community-acquired pneumonia, and skin and soft tissue infections

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Objective: Studies have found a need for improved antimicrobial stewardship in the outpatient setting. The literature is limited by disease states studied as many focus on viral infections, as well as lacking generalizability due to differences in local resistance patterns. This study focuses on the emergency departments (EDs) within Hartford Healthcare (HHC) and quantifies the proportion of antibiotic prescriptions that are deemed inappropriate for the most common infections that are treated as an outpatient.

Methods: A retrospective cohort study was conducted at six EDs within HHC between October 2018 and February 2020 in patients 18-89 years old treated for urinary tract infections (UTI), community-acquired pneumonia (CAP), and skin/soft tissue infections as an outpatient in the ED. Appropriateness was analyzed based on the following key factors: need for antimicrobial therapy; antibiotic choice, dose, length of treatment, and directions in concordance with national guidelines and local resistance patterns; and no clinically relevant drug-drug and drug-disease interactions, unnecessary dual coverage, or a better or safer alternative available. The entire prescription was marked as inappropriate if any factor was deemed inappropriate.

Results: Of the 318 patients reviewed, a total of 274 patients were included. Sixty-four percent (174/274) had an antibiotic prescription that was deemed inappropriate, which is significantly higher than the national average of 30% ($p < 0.001$). The agent selection, duration, and dose were most the frequent reasons for inappropriateness. The most inappropriately used agents were fluoroquinolones and azithromycin, with azithromycin being used as monotherapy for CAP frequently. A positive culture required modification of therapy 31% of the time and more so when the drug was guideline recommended. For example in UTI, when empiric antibiotic selection was per UTI guidelines, 31% (14/53) required modification compared to 19% (3/16) when the agent was not. This was most apparent when cephalexin and nitrofurantoin were used as empiric therapy.

Conclusion: The use of antibiotics at HHC EDs was not in concordance with national guidelines in the study period. However, the cultures were sensitive less often to agents deemed appropriate per guidelines for empiric therapy. It is possible that the ideal treatments of bacterial infections in this community are not representative of national resistance patterns. Developing ED-specific antibiograms would help identify the ideal agents for use. Creation of order panels for discharge of common infections and prospective pharmacist review at ED discharge could increase appropriate utilization of preferred agents.