

Evaluation of fosfomycin for extended spectrum beta-lactamase producing *Escherichia coli* and vancomycin resistant *Enterococcus* urinary tract infections

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**OBJECTIVE:** Urinary tract infections (UTIs) due to multi-drug resistant (MDR) pathogens are associated with prolonged hospital lengths of stay, higher rates of secondary bacteremia, and worse clinical outcomes. Treatment options in this setting are often limited to intravenous broad-spectrum antibiotics (BSA). Clinical data has demonstrated that fosfomycin offers a convenient, well tolerated, less expensive oral alternative for MDR UTIs such as extended spectrum beta-lactamase producing *Escherichia coli* (ESBL *E. coli*) and vancomycin resistant *Enterococcus* (VRE). The purpose of this study was to identify antimicrobial stewardship opportunities to use fosfomycin in lieu of BSA for these MDR pathogens across Yale New Haven Health System.

**METHODS:** In this retrospective chart review, medical records of adult patients with urine cultures growing ESBL *E. coli* or VRE from January 2018 to December 2019 were reviewed. The following were exclusion criteria: patients younger than 18 years of age, renal transplant, polymicrobial urine cultures, urine cultures growing the same organism within 30 days of a previous isolate, concomitant bacteremia, presence of ileal conduit or nephrostomy tube(s), transition to hospice within 72 hours of urine culture collection, and patients who expired before completion of therapy. The primary endpoint of this study was number of possible stewardship opportunities to use fosfomycin in lieu of alternative BSA for the treatment of ESBL *E. coli* and VRE UTIs. The secondary endpoint was potential cost savings.

**RESULTS:** 161 ESBL *E. coli* and 31 VRE urine isolates met inclusion criteria. Fosfomycin susceptibilities were tested for 84% of ESBL *E. coli* isolates at one hospital within the health system, whereas over 90% of isolates at all other delivery networks (DNs) were not tested. Fewer VRE isolates were available for review, however similar trends were noted. With regard to the primary endpoint, 70 potential opportunities to utilize fosfomycin in lieu of a carbapenem or piperacillin/tazobactam were identified for the ESBL *E. coli* isolates. 20 opportunities to avoid a PICC or midline placement were also identified. The majority of these opportunities included patients at DNs where fosfomycin sensitivities were not routinely tested. 15 cases were identified where fosfomycin could have been considered in place of linezolid. Potential cost savings was estimated to be around \$5,800.

**CONCLUSION:** There is an opportunity to utilize fosfomycin as a cost-effective oral alternative for the treatment of ESBL *E. coli* and VRE UTIs across the health system. Utilization will avoid additional costs of central line placement and need for outpatient parenteral antibiotic therapy (OPAT).