

Results. 5,842 patients were eligible for PO conversion and analysis; 1,890 (32.5%) actually converted to PO during their hospital stay; 2,199 (37.6%) were either FQ-R, ESBL+, or both. Baseline demographics were similar between groups. Highly resistant patients (FQ-R and ESBL+) were less likely to transition to PO compared to those with neither FQ-R nor ESBL infections (16.7% vs. 37.0%). Among patients who did convert to PO, post-PO-eligible LOS was shorter across all severity strata compared to patients who did not convert (p< 0.0001). For those who did not convert, post PO-eligible LOS was 2.6, 2.9, 3.3, and 4.0 days by severity quartile, respectively. Among patients who did convert to PO, the total cost was \$1,043 less (p=0.024) for patients in the 3rd quartile of severity and \$1,512 less (p=0.004) for patients in the 4th quartile of severity, compared to the patients who did not convert.

Conclusion. Only ~1/3 of patents eligible for PO therapy are converted during hospitalization. Reduced LOS and substantial cost savings could be recognized by efficient PO conversion and hospital discharge. Lack of PO therapies with activity against resistant pathogens has made this challenging; new PO options may help reduce hospital costs and resources required to treat these UTI patients.

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1673. Epidemiology of Complicated Urinary Tract Infections (cUTIs) Presenting in Emergency Departments Across the United States (US)

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Session: P-73. UTIs

Background. Complicated urinary tract infection (cUTI) is a common emergency department (ED) diagnosis. Results of urine culture and antimicrobial susceptibility testing are usually not available for up to 48 hours after an ED visit; therefore, diagnosis and treatment decisions are empiric and based on symptoms, physical findings, and underlying risk of resistance. We sought to understand the epidemiology and incidence of resistance to commonly used oral antibiotics among patients presenting to US EDs with cUTI.

Methods. A retrospective multi-center study using data from the Premier Healthcare Database (2013-18) was performed. Inclusion criteria: (1) age ≥ 18 years, (2) primary cUTI ED/inpatient discharge diagnosis, (3) positive blood or urine culture between index ED service days -5 to +2. Transfers from acute care facilities were excluded. We examined rates of resistance to the following drugs/classes: 3rd generation cephalosporins, fluoroquinolones, trimethoprim-sulfamethoxazole, fosfomycin, and nitrofurantoin in patients presenting to the ED, stratified by those who were ultimately admitted as inpatients vs. not. Regional variation by US Census Division was examined.

Results. 187,789 patients met inclusion criteria; 119,668 (63.7%) were admitted to the hospital. 4.6% had positive cultures only with gram-positive bacteria; the remainder had at least one gram-negative pathogen. *E. coli* was the most common infecting pathogen, present in 72.1% of ED-only infections and 51.4% of those admitted. 44.7% and 58.4% of ED-only and admitted patients, respectively, were resistant to at least 1 of the 5 drugs/classes examined (see table). We saw substantial regional variation; resistance to at least 3 of 5 drugs/classes across all patients ranged from 5.0% in West North Central region to 11.1% in East South Central region (national average: 9.1%).

Resistance Rates by Drug/Drug Class and Hospital Admission Status

	Emergency Only (n = 68,121)	%	Inpatient (n = 119,668)	%	p-value
Presence of at least 1 organism that is resistant to the following:					
3rd Generation Cephalosporins	4,220	6.19%	15,979	13.35%	<0.001
Fluoroquinolones	12,570	18.45%	42,892	35.84%	<0.001
Trimethoprim-Sulfamethoxazole	16,070	23.59%	30,828	25.76%	<0.001
Nitrofurantoin	11,071	16.25%	30,211	25.25%	<0.001
Fosfomycin	10	0.01%	88	0.07%	<0.001
Most Resistant Organism; Resistant to the drugs above					
Resistant to 0 of the above antibiotics	37,675	55.31%	49,808	41.62%	
Resistant to 1 of the above antibiotics	20,790	30.52%	37,497	31.33%	<0.001
Resistant to 2 of the above antibiotics	6,457	9.48%	18,509	15.47%	
Resistant to 3+ of the above antibiotics	3,199	4.70%	13,854	11.58%	

Conclusion. Patients with cUTI infections presenting to EDs in the US are frequently resistant to many commonly used oral antibiotics, even in patients not admitted to the hospital. Local epidemiology and resistance should be considered when

making empiric treatment decisions in the ED. New oral options for cUTI patients are needed to address the growing challenge of resistance.

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1674. Epidemiology of Urinary Tract Infections in the Renal Transplant Population in a Large Urban Midwestern Hospital: A Retrospective Cohort Study
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Session: P-73. UTIs

Background. Renal Transplant Recipients (RTR) are at high risk for Urinary Tract Infections (UTIs). However, the best empiric option for treatment is not well defined, because the prevalence of extended spectrum beta-lactamase (ESBL) Enterobacteriaceae and carbapenem resistant Enterobacteriaceae (CRE). The primary purpose of this study was to describe the prevalence of multidrug resistant UTIs in a contemporary cohort of RTR at a large Midwestern tertiary care hospital. Secondary outcomes evaluated frequency of key symptoms and physical exam findings, as well as characteristics of patients who developed multidrug resistant organisms, morbidity, and mortality.

Methods. This was a single-center retrospective cohort study. Patients were included if they were 18 years or older and underwent their transplant between July 11, 2019 and November 26, 2018. Statistical analysis was performed using Fischer's Exact T-test for comparison of the patients with and without ESBL UTIs. Significance was defined by a p < 0.05

Results. Two hundred fifty-two patients were evaluated (median age 54.4, 38.3% female gender), 36 patients developed UTIs, and no patients had CRE organisms. ESBL UTI prevalence was 7/252 (2.8%) among the total RTR population and 7/36 (19.4%) among the population of RTR who developed UTIs. Mortality rates did not differ significantly between patients with and without ESBL UTI (0% and 6.9%, respectively, p=489) (Table 1). Additional clinical characteristics of the patients that developed ESBL UTIs were also obtained (Table 2).

Table 1: Comparison of non-ESBL UTI and ESBL UTI

Characteristics	All patients with UTIs	Non-ESBL/CRE UTIs	ESBL UTIs	Significance
Fevers	16/36 symptomatic 12/36 documented	11/29 symptomatic 8/29 documented	5/7 symptomatic 4/7 documented	p=.137 p=.205
Frequency	3/36	3/29	0/7	p=.006
Burning with urination	10/36	8/29	2/7	p=.962
Pain over graft	8/36 symptomatic 8/36 on exam	4/29 symptomatic 5/29 on exam	4/7 symptomatic 3/7 on exam	p=.081 p=.264
Imaging (CT or US) performed	22/36	15/29	7/7	p=.005
Organisms identified	17 <i>E. coli</i> 6 <i>E. cloacae</i> 2 <i>E. faecalis</i> 3 <i>K. pneumoniae</i> 2 <i>Pseudomonas sp</i> 6 Other	12 <i>E. coli</i> 6 <i>E. cloacae</i> 2 <i>E. faecalis</i> 3 <i>K. pneumoniae</i> 1 <i>Pseudomonas sp</i> 5 Other	5 <i>E. coli</i> 1 <i>Pseudomonas sp</i> 1 Other	n/a
Hospitalized	23/36	17/29	6/7	p=.138
Bacteremia	8/36	5/29	3/7	p=.264
Mortality up to 1-year post transplant	2/36	2/29	0/7	p=.489

Fischer's Exact T-test; p < 0.05 considered significant.

Abbreviations: Computer tomography scan (CT); Extended spectrum beta-lactamase (ESBL); Ultrasound (US); Urinary Tract Infection (UTI)

Table 2: Characteristics of Patients with ESBL UTI

Characteristics	1	2	3	4	5	6	7
Sex	Male	Male	Female	Male	Female	Male	Male
Alive at time of study?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Living Donor	No	Yes	Yes	Yes	No	No	No
Cold ischemia time	17:12	2:78	2:55	1:8	16:3	22:2	31:98
Acute rejection requiring treatment at time of study	No	No	No	no	No	No	No
Benign prostatic hyperplasia	No	No	Yes	No	No	No	No
Nephrolithiasis	No	No	Yes	No	No	No	No
Diabetes	No	No	Yes	Yes	No	Yes	Yes
Duration of symptoms before presentation	Not documented	0:5	2	1	1	1	3
Location diagnosis was made	Outpatient clinic	ED	ED	Inpatient	Inpatient	Outpatient	ED
Fever	No	Yes	No	Yes	Yes	No	Yes
Imaging finding	Not documented	No abnormalities	Urethral thickening	Nonobstructing stone	Fluid collection	Postop perinephric fluid collection, stent in place	Perinephric fluid collection, stone in native kidney
Bacteremia	No	Yes	No	No	No	Yes	Yes
Ciprofloxacin MIC interpretation	R	S	S	R	R	R	R
Fosfomycin MIC interpretation	Not performed	Not performed	R	S	Not performed	S	Not performed
Meropenem MIC interpretation	S	S	S	S	S	S	S
Number of antibiotics received	1	3	3	2	2	2	5
Days before adequate coverage started	0	2	2	1	2	0	3

Abbreviations: Emergency Department (ED); Extended spectrum beta-lactamase (ESBL); Intermediate (I); minimum inhibitory concentration (MIC); post-operative (post-op); Resistant (R); Susceptible (S)

Conclusion. Prevalence of ESBL UTIs among RTR are low at a tertiary Midwestern hospital.

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1675. Epidemiology of Urinary Tract Infections in the United States, 2009 - 2018

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Session: P-73. UTIs

Background. Urinary tract infections (UTIs) are one of the most common bacterial infections. There is a lack of large epidemiologic studies evaluating the etiologies of UTIs in the United States. This study aimed to determine the prevalence of different UTI-causing organisms and their antimicrobial susceptibility profiles among patients being treated in a hospital setting.

Methods. We used the Premier Healthcare Database. Patients with a primary diagnosis code of cystitis, pyelonephritis, or urinary tract infection and had a urine culture from 2009- 2018 were included in the study. Both inpatients and patients who were only treated in the emergency department (ED) were included. We calculated descriptive statistics for uropathogens and their susceptibilities. Multi-drug-resistant pathogens are defined as pathogens resistant to 3 or more antibiotics. Resistance patterns are also described for specific drug classes, like resistance to fluoroquinolones. We also evaluated antibiotic use in this patient population and how antibiotic use varied during the hospitalization.

Results. There were 640,285 individuals who met the inclusion criteria. Females make up 82% of the study population and 45% were age 65 or older. The most common uropathogen was *Escherichia Coli* (64.9%) followed by *Klebsiella pneumoniae* (8.3%), and *Proteus mirabilis* (5.7%). 22.2% of patients were infected with a multi-drug-resistant pathogen. We found that *E. Coli* was multi-drug resistant 23.8% of the time; *Klebsiella pneumoniae* was multi-drug resistant 7.4%; and *Proteus mirabilis* was multi-drug resistant 2.8%. The most common antibiotics prescribed were ceftriaxone, levofloxacin, and ciprofloxacin. Among patients that were prescribed ceftriaxone, 31.7% of them switched to a different antibiotic during their hospitalization. Patients that were prescribed levofloxacin and ciprofloxacin switched to a different antibiotic 42.8% and 41.5% of the time, respectively.

Conclusion. *E. Coli* showed significant multidrug resistance in this population of UTI patients that were hospitalized or treated within the ED, and antibiotic switching is common.

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1676. Evaluation of Antibiotic Overuse for Asymptomatic Bacteriuria in a Hospital with Low Baseline Antibiotic Use

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Session: P-73. UTIs

Background. In 2019, the Infectious Diseases Society of America published guidelines for the management of asymptomatic bacteriuria (ASB) with recommendations to avoid antimicrobial therapy in most patients. Denver Health has existing guidance for the management of patients with a urinary tract infection (UTI) and in August of 2019, implemented specific guidance for the management of ASB. As an institution, Denver Health has a Standardized Antimicrobial Administration Ratio (SAAR) of 0.8-0.9, suggesting a strong antimicrobial stewardship program with a ratio of < 1. The purpose of this study is to assess if signs and symptoms were present in patients prescribed an antibiotic for UTI.

Methods. We retrospectively identified hospitalized patients at least 18 years old who were prescribed an antibiotic with "UTI" as the indication from March 1st to

August 31st, 2019. Patients with catheter-associated UTIs were excluded. A random sample of 50 cases was manually reviewed for signs and symptoms of infection. Signs were considered fever, defined as at least 38°C or leukocytosis, defined as at least 10 k/uL WBC. Symptoms collected were based on documentation of patient reported dysuria, frequency, or urgency, or findings of hematuria. The primary outcome was proportion of patients prescribed an antibiotic for UTI in the absence of signs or symptoms. Prescribing patterns for choice and duration of antimicrobials were also surveyed.

Results. A total of 382 antibiotics were prescribed for UTI during the study period. Of the 50 cases reviewed, median age was 65.8 years, with 11% being male. Overall, 29 patients (58%) had no documented symptoms while being treated for UTI. Additionally, 22 patients (44%) had no documented fever, leukocytosis, or urinary symptoms. The most commonly prescribed antibiotics were cefdinir, fosfomycin, and nitrofurantoin. Tables 1 and 2 include additional findings.

Table 1 Symptomology and Type of UTI

Measurement	Result (n=50)
Male gender; n (%)	11 (22)
Age (years); median (range)	65.82 (29-94)
Hospital day culture obtained; median (range)	1 (0-24)
Type of UTI per chart diagnosis; n (%)	
Simple cystitis	9 (18)
Complicated cystitis	34 (68)
Pyelonephritis	7 (14)
Fever; n (%)	2 (4)
Leukocytosis; n (%)	13 (26)
Altered mental status (AMS); n (%)	14 (28)
No documented signs [†] or symptoms [‡] ; n (%)	22 (44)
No documented symptoms [‡] suggestive of UTI; n (%)	29 (58)
No documented symptoms* in the presence of: n (%)	
Leukocytosis	7 (14)
Fever	1 (2)
Both	1 (2)
AMS in the absence of fever and leukocytosis with no documented symptoms*; n (%)	7 (14)
AMS in the presence of fever and leukocytosis, but no documented symptoms*; n (%)	2 (4)
For symptomatic UTI, types of symptoms* documented; n = 21 (% of those symptomatic)	
Dysuria	12 (57)
Frequency	5 (24)
Urgency	1 (5)
Hematuria	4 (19)
Other (CVA tenderness, flank pain)	3 (14.3)
Number of UA reflexed to culture; n = 48 (%)	44 (91.7)
Negative UA with subsequent culture; n = 48 (%)	5 (10.4)
Culture Results; n = 44 (%)	
1 isolate	30 (68.2)
Contamination OR ≥ 2 isolates	12 (27.3)
No growth	2 (4.5)
Signs = fever or leukocytosis; symptoms = dysuria, frequency, urgency, hematuria	