

Background. Febrile UTI/pyelonephritis is a common diagnosis for children presenting to the Emergency Department (ED). A Cochrane review of the management of pyelonephritis in children showed no difference between intravenous (IV) and oral antibiotics. Despite this, many children are treated with at least initial IV antibiotics. The reasons are often unclear and it is uncertain whether this is appropriate as the Cochrane review excluded children at the worse end of the clinical spectrum. Our aim was to determine why physicians made these decisions as a first step in determining whether this is necessary.

Methods. A prospective observational study of children presenting to the ED at the Royal Children's Hospital with UTI/pyelonephritis from Oct 2016 – Apr 2017. Data collection included demographic, clinical features, microbiology, treatment and outcomes. ED physicians were asked to record reasons for prescribing IV antibiotics and for treating the patient in hospital vs. in hospital-in-the-home (HITH).

Results. 170 children were included, 123 (72%) were treated with oral antibiotics, 43 (25%) IV and 4 (3%) intramuscular – these are now included in the IV group. In the IV group, 32 (19%) were admitted, 3 (2%) were transferred directly to HITH from ED and 13 had a single dose of IV antibiotics in ED and were discharged. A comparison of the clinically significant features between the two groups is outlined (Table 1). The commonest reasons cited for using IV antibiotics and for hospital admission vs. HITH is shown (fig 1 and 2).

Conclusion. This is the first study of decision-making for IV antibiotics and hospital admission for UTI/pyelonephritis in children. The fact that the reasons cited for IV antibiotics were often not evident on objective clinical data suggests that there may be overuse of IV antibiotics. We will present an assessment of appropriateness and suggest alternatives to the traditional IV and hospital admission route.

Table 1

	Oral Patient no. (%) n = 123	Intravenous Patient no. (%) n = 47	p value
Age(y), mean (range)	4.8(0.3–17.9)	5.4(0.3–16.5)	0.68
At presentation			
Prior antibiotics	14(11%)	12(26%)	0.03
History of resistant organism	7(6%)	9(19%)	0.02
Symptoms			
Fever	63(51%)	36(77%)	<0.01
Rigors	7(6%)	9(19%)	0.02

Figure 1 - Reason for i.v. antibiotics

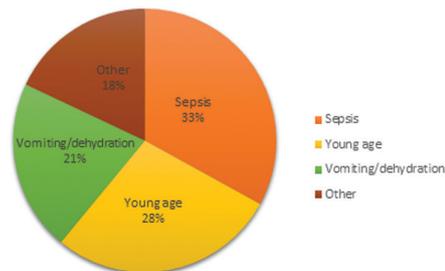
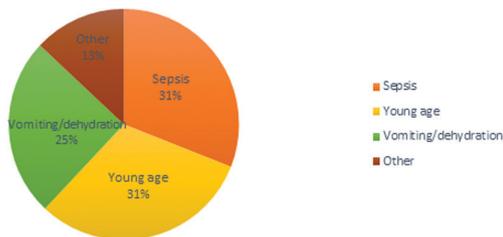


Figure 2 - Reason for hospital admission versus HITH



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1132. Assessment of Reflex Urine Culture Criteria Changes and its Impact on Treatment of Asymptomatic Bacteriuria

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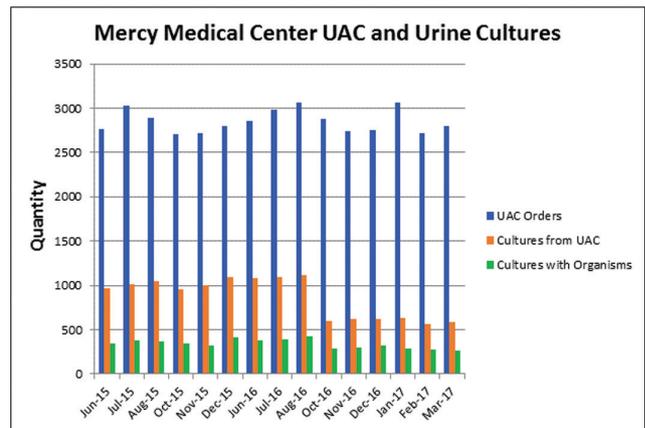
Background. Asymptomatic bacteriuria (ASB) is a common clinical condition identified by the presence of bacteria in the urine of a patient without signs and symptoms of a urinary tract infection (UTI). Treatment of ASB leads to unnecessary antimicrobial use and can cause more harm than benefit in many patients. This study is to determine the impact of more stringent criteria for urinalysis with culture if indicated (UAC), implemented in September 2016, on the treatment of asymptomatic bacteriuria.

Methods. A pre-post descriptive study of patients was conducted with an order placed for UAC in the Emergency Department (ED) or hospital. Data was collected retrospectively via chart reviews. The data on ASB patients from November 2015 to April 2016 was compared with the post-implementation period October 2016 to January 2017. The number of UAC orders and cultures were averaged for 6 months pre and post implementation of the criteria change.

Results. A total of 580 patient charts were assessed post-implementation of the UAC criteria change. A majority of the orders originated from the ED, (N = 430, 72.8%). ASB was treated inappropriately at a rate of 60.4% (N = 64/106) pre-implementation and a rate of 65% (N = 41/63) post implementation, P = 0.542. The total number of UAC ordered before and after implementation did not change, (N = 2852 pre-intervention vs N = 2825 post-intervention, P = 0.744), as seen in Figure 1. However, the number of reflexed urine cultures did significantly decrease post criteria change, (N = 1056 pre-intervention vs. N = 603 post-intervention, P < 0.0001). In addition, the number of positive urine cultures also significantly decreased, (N = 378 pre-intervention vs. N = 289 post-intervention, P = 0.0447). The impact the criteria change had on patient care is the number of potential antibiotic courses saved by reflexing fewer urine cultures off the UAC. Based on the decrease in positive urine cultures, it is estimated 702 courses of inappropriate antibiotics for ASB could be saved per year (59/month).

Conclusion. More stringent criteria for reflex urine cultures significantly decreases the number of urine cultures performed, therefore decreasing the number of patients treated with ASB. Additional stewardship measures are necessary to reduce the treatment of ASB for patients who have cultures performed.

Figure 1



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1133. Susceptibility Trends of Urinary Tract Infections Over a 15 Year Period on a University Campus

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Background. Acute uncomplicated cystitis (AUC) is one of the most common infections for which antimicrobials are prescribed. Despite IDSA AUC guideline recommendations, prescribing practices are varied throughout the US. Per IDSA recommendations, nitrofurantoin (NTF), fosfomycin, and trimethoprim/sulfamethoxazole (TMP/SMX) are all considered first line therapy for AUC, however there is concern of resistance to some of these agents. Quality improvement activity at the University of

California, Davis Student Health Center (UCDSHC) has made prescribing NTF preferred for acute cystitis since 2001 as TMP/SMX has community resistance rates of ~20%. Ciprofloxacin is the second line agent at UCDSHC.

Methods. UCDSHC reviewed all urine cultures and susceptibilities for clinical and epidemiologic purposes. Susceptibility results were gathered from the UCDSHC microbiology laboratory from 2001–2016. Prescribing data was obtained from UCDSHC under diagnosis codes consistent with cystitis or UTI to demonstrate antibiotic prescribing trends. Susceptibilities were evaluated over the 15-year time period (2001–2016). TMP/SMX, FQs, and NTF were the primary agents evaluated in this study.

Results. From 2001–2016, 3,831 *E. coli* and 296 *S. saprophyticus* isolates were evaluated, accounting for 88% of the total number of organisms. *E. coli* susceptibilities to NTF remained >98% from 2001–2016. *E. coli* susceptibilities to FQs trended down from 99% in 2001 to 88% in 2016. *E. coli* susceptibilities to TMP/SMX remained stable around 80% from 2001–2016. *S. saprophyticus* remained highly susceptible to NTF, FQs, and TMP/SMX (95%, 97%, and 100% respectively at the end of the study period). In total, 12,298 prescriptions were written from 2008–2016. Eighty percent (9,875) were NTF and 17% (2,016) were FQs. The remaining 1% and 2% were TMP/SMX and 'Other', respectively.

Conclusion. After changes in prescribing practice in 2001, NTF was used in 80% of cystitis cases over 15 years and retained excellent activity against common urinary pathogens. FQs retained acceptable activity for empiric use for urinary tract infections, but susceptibilities trended down notably despite limited FQ use. TMP/SMX did not regain increased activity over the time period.

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1134. Assessment of Antimicrobial Susceptibility Testing Profiles of Urine Isolates from Veterans to Guide Empiric Therapy for Suspected Urinary Tract Infection

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Background. Urinary tract infection (UTI) is common among patients at Veterans Affairs Medical Centers (VAMCs), many of whom are elderly men with underlying medical or urological problems. Most UTI treatment guidelines address uncomplicated UTI in women and presume knowledge of local antimicrobial susceptibility testing (AST) patterns for uropathogens, which often are unknown or are inferred from *E. coli*. To inform selection of empiric therapy for UTI at our VAMC, we compiled AST data for one year's urine isolates.

Methods. We compiled AST results (bioMérieux VITEK[®]) for the 2,494 significant urine isolates from the Minneapolis VAMC clinical microbiology laboratory from June 2013 through May 2014. For "drug-bug" combinations that were not tested we imputed results based on local or published data, and/or expert opinion. We then calculated cumulative % susceptible for 25 relevant antimicrobial agents, overall and stratified by Gram stain group and clinical site (intensive care unit, inpatient, outpatient, community residential centers, or extended care). In ambiguous situations susceptibility was analyzed as both 0% and 100%.

Results. The 2,494 urine isolates included 946 Gram-positive and 1,548 Gram-negative organisms. Species distribution varied significantly by clinical site. *E. coli* represented only 27% of isolates overall (9–37%, depending on site). *Enterococcus* (14%) and other Gram-positives (23%) were also prevalent. Cumulative AST profiles varied significantly (i) by Gram stain group, (ii) between *E. coli* and other Gram-negatives, and (iii) by clinical site. No tested oral agent provided $\geq 80\%$ overall susceptibility. Although AST data were unavailable for fosfomycin, imputation suggested 82%–95% susceptibility overall.

Conclusion. Among urine isolates from veterans, *E. coli* was a minor contributor and a poor surrogate for total population AST profiles. The only oral agent that provided $\geq 80\%$ susceptibility overall was fosfomycin, suggesting that it could be an important option for empiric lower UTI therapy for veterans. Urine isolate-specific antibiograms that reflect local AST data, stratified by Gram stain group and clinical site, could improve empirical UTI therapy for veterans, as could performance of urine Gram stains.

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1135. Poor Clinical Outcomes Associated with Community-Onset Extended-Spectrum Cephalosporin-Resistant Enterobacteriaceae Urinary Tract Infections

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Background. Urinary tract infections (UTIs) are the most common bacterial infection among adults in the community. Recent data suggest an increase in bacterial resistance to first line antibiotics used for UTI, though the impact on clinical outcomes is unclear. The objective of our study was to determine clinical outcomes associated with community-onset extended-spectrum cephalosporin-resistant (ESC-R) Enterobacteriaceae (EB) UTI.

Methods. A retrospective cohort study was conducted in a large health system from 2010 to 2013. All patients presenting to an emergency department or outpatient clinic with UTI due to EB were included. Exposed subjects were those with an EB demonstrating resistance to an ESC (ceftriaxone or ceftazidime). Unexposed subjects were those with ESC-susceptible EB UTIs and were matched to cases 1:1 based on study year. Multivariable logistic regression analyses were performed to evaluate the association between ESC-R EB UTI and 1) clinical failure (defined as ongoing symptoms, repeat positive culture, or need for additional antibiotics within 7 days); 2) inappropriate initial antibiotic therapy (IIAT) (defined as failure to receive an antibiotic to which the organism was susceptible within 48 hours of presentation).

Results. A total of 302 patients with community-onset EB UTI were included. On multivariable analyses, a UTI with an ESC-R EB was significantly associated with clinical failure (odds ratio [OR] 5.12, 95% confidence interval [CI] 2.79–9.39, $P < 0.01$). Other variables independently associated with clinical failure included presence of pyelonephritis at the time of UTI diagnosis (OR 2.15, 95% CI 1.14–4.03, $p < 0.02$) and infection with *Citrobacter* species (OR 29.56, 95% CI 4.46–195.91, $P < 0.01$). ESC-R EB UTI was also associated with IIAT on multivariable analysis (OR 3.73, 95% CI 2.25–6.21, $P < 0.01$).

Conclusion. Community-onset UTI due to an ESC-R EB organism is associated with a significantly increased risk of clinical failure, which may be due in part to the use of inappropriate initial antibiotic therapy. Further studies are needed to determine which patients in the community are at high risk for drug-resistant infection to help inform prompt urine culture ordering and appropriate antibiotic prescribing for ESC-R EB.

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1136. Antibiotic Bladder Irrigation in Preventing and Reducing Chronic Urinary Catheter-Related Urinary Tract Infections (UTI)

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Background. Recurrent UTI is a common complication of chronic urinary catheter use. We report our experience with the use of antibiotic bladder irrigation to reduce catheter associated UTI and systemic antibiotics use.

Methods. Retrospective chart review of patients treated with antibiotic bladder irrigation for recurrent UTI related to chronic urinary catheter (2013–2016). Data collected include demographic, co-morbidities, urological anomalies, symptoms, documented pathogens during episodes of infection, and irrigation medication used. Antibiotic regimen included: gentamicin, gentamicin alternated with piperacillin-tazobactam, or tobramycin once weekly. Parameters for successful therapy and alleviation of symptoms included complete relief of symptoms for six months and no systemic antibiotics use for six months post initiation of therapy, or reduced frequency of infections for one year post initiation of therapy.

Results. 39 patients were enrolled, all were patients who had been referred to infectious disease physicians after persistence of symptoms despite multiple rounds of systemic antibiotics and had at least 6 episode of documented UTI despite following guideline for aseptic urinary catheter insertion and care. Mean age 66.5 y (range 27–92), 69% male. Most common urologic problem was neurogenic bladder in 48% and prostate or bladder surgery. 5 self-catheterize, 12 had suprapubic catheter and 22 had chronic indwelling catheter. Most common co-morbidities include: DM, BPH, paraplegia, spina bifida and multiple sclerosis. Most common presenting symptoms were abdominal pain 49% and fever 34%. Most common organisms were *Escherichia coli* 38%, *Pseudomonas aeruginosa* 23% and *Enterococcus faecalis* 18%. 67% used gentamicin bladder irrigation. 26 (66.67%) met the criteria for alleviation of symptoms and success with antibiotic irrigation therapy, and a further four featured improvement of frequency of symptoms despite not successfully meeting the study's pre-set criteria for full improvement. Patient did not report any associated side effect.

Conclusion. Use of antibiotic bladder irrigation was successful in reducing symptom frequency and requirement of systemic antibiotics. Further Studies needed to assess the benefit of this mode of therapy.

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1137. Antibiotic Susceptibilities and Appropriateness of Initial Drug Selection for Community-Acquired Urinary Tract Infections (UTI) Caused by Extended-Spectrum B-Lactamase (ESBL)-Producing Pathogens

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