reported in the US, making the selection of empiric oral therapy increasingly unlikely to cover the offending uropathogen.

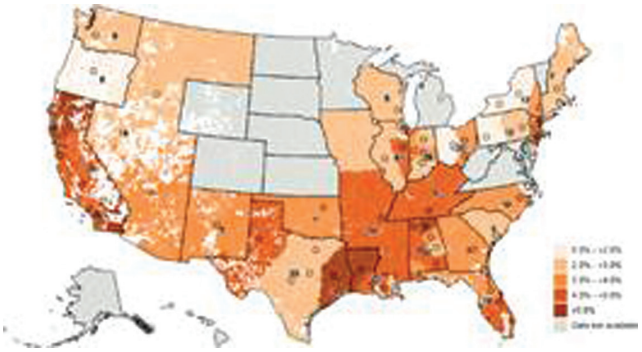
Methods. We queried the BD Insights Research Database (Franklin Lakes, NJ) to evaluate ambulatory antibiotic fill history for patients from 15 US institutions with an ambulatory urine culture positive for ≥10^3 CFU/mL of an ENT. Patients who filled a prescription for an oral antibiotic were further categorized into those with a urine culture positive for a susceptible or non-susceptible (NS) pathogen. ESBL positivity was presumed if the isolate was NS to extended spectrum cephalosporins. Outcome was assessed using two surrogate endpoints: hospital admission, or a follow-up oral antibiotic within 28 days of initial antibiotic fill. Urine 30 day nonduplicate ambulatory three drug resistance rates in Q2 2017 were determined by zip code for 379 facilities.

Results. 48/5,587 (0.9%) episodes of UTI with an outpatient urine culture had an Enterobacteriaceae that was resistant to quinolones, T/S, and NFH, and was ESBL-positive. Of those with at least three-drug class resistance, the hospital admission rate was 28%.

	28-Day Prescription Fill				28-Day Readmission			
	N (%)	Failures	Fail %	*P*-Value	*N* (%)	Failures	Fail %	*P*-Value
Overall	5,587	1250	22		5,395	379	7	
Pan-susceptible	1,771 (32)	287	16	0.0001	1,627 (30)	124	8	0.0001
3-4 Class Resistance[a]	197 (4)	55	28		184 (3)	51	28	

[a]All resistant to quinolones, T/S, and β-lactams; four class also includes resistance to NFH.

Figure: Geographic prevalence of three drug class resistance (quinolones, β-lactam, T/S) among Enterobacteriaceae causing UTI in the outpatient setting.



Conclusion. Multiclass resistance to existing oral antibiotics is prevalent throughout the United States in patients for whom an outpatient urine culture is available, with 1% of organisms resistant to all commonly available oral classes. Multidrug resistance in patients with an outpatient urine culture is associated with a significantly increased risk of treatment failure and subsequent hospitalization.

Disclosures. **M. Dunne**, Iterum Therapeutics: Employee and Shareholder, Salary. **V. Gupta**, Melinta Therapeutics, Inc.: Research Contractor, Research support. **S. Aronin**, Iterum Therapeutics: Employee and Shareholder, Salary. **S. Puttagunta**, Iterum Therapeutics: Employee and Shareholder, Salary.

1528. A Real-World Perspective on Treatment of CRE UTIs With Oral Agents

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Session: 150. Urinary Tract Infection
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Background. Treatment approaches for carbapenem-resistant Enterobacteriaceae (CRE) urinary tract infections (UTIs) are typically limited to salvage agents with considerable toxicity or novel β-lactam/β-lactamse inhibitor combinations that are best used judiciously. Doxycycline (DOX) and fosfomycin (FOS) are orally available alternatives that demonstrate *in vitro* susceptibility against CRE; however, clinical data demonstrating their efficacy is limited.

Methods. We performed a retrospective review of patients with CRE UTIs who received ≥1 dose of FOS or ≥5 days of oral DOX. UTI was defined as a positive urine culture growing ≥1,000 CFU/mL of CRE among patients with dysuria, increased urinary frequency, suprapubic or flank pain or tenderness, fevers, or altered mental status without an alternative etiology. Cure was defined as resolution of symptoms within 7 days without reoccurrence within 30 days. Microbiological failure was defined as a positive urine culture within 14 days.

Results. Twenty-two patients were included, 14 and eight were treated with FOS and DOX, respectively. Median age was 59 (range: 24–86), 32% were male, 27% were transplant recipients, and the median Charlson score was 4 (0–9). Eighty-six percent of cases were healthcare associated and 73% met CDC criteria for UTI. UTIs were complicated by pyelonephritis in three patients, but none had concomitant bacteremia. There were no differences in baseline characteristics, underlying diseases, or severity of illness among patients treated with FOS or DOX. 14% of FOS-treated patients received >1 dose. The median duration of DOX treatment was 10 days (6–21). Cure occurred in 100 and 75% of patients treated with FOS and DOX, respectively (P = 0.36; Figure 1). Patients treated with DOX had numerically higher rates of microbiological failure (38% vs. 21%; P = 0.62) and statistically higher rates of clinical relapse (38% vs. 0%; P = 0.04). Only one adverse event was recorded in a pt receiving FOS.

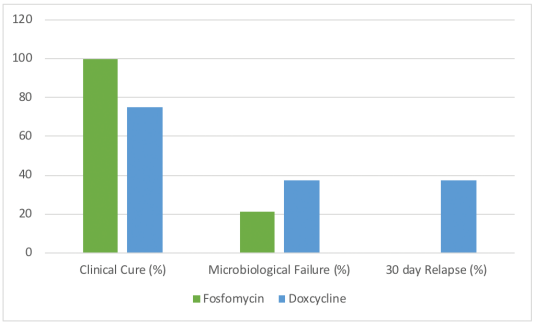
Conclusion. In our experience, FOS and DOX were effective in treating CRE UTIs; however, higher rates of microbiologic failures and clinical relapse occurred among patients receiving DOX. FOS should be considered the preferred option for CRE UTI among patients who are candidates for treatment with oral antibiotics. Comparisons between FOS and intravenous antibiotics for CRE UTI are warranted.

Table 1: Outcomes of patients with CRE UTI treated with Fosfomycin and Doxycycline

Outcomes n (%)	Fosfomycin n= 14 (percentage)	Doxycycline n= 8 (percentage)	p value
Clinical Cure	14 (100)	6 (75)	0.1212
Microbiological Failure	3 (21.4)	3 (37.5)	>0.6244
Persistent infection	3 (30)	2 (40)	>0.999
30 Day relapse	0 (0)	3 (37.5)	0.0364
Readmission due to CRE	0 (0)	1 (12.5)	0.3636
In hospital mortality/discharge to hospice	1 (7.1)	1 (12.5)	>0.999
Adverse reactions[1]	1 (7.1)	0 (0)	>0.999

1- One patient had emesis with one dose of fosfomycin, tolerated repeat dose
CRE= Carbapenem Resistant Enterobacteriaceae

Figure 1: Outcomes of patients with Carbapenem Resistant Enterobacteriaceae UTI treated with Fosfomycin and Doxycycline



Disclosures. **All authors:** No reported disclosures.

1529. Suprapubic Catheter Placement Improves Antimicrobial Stewardship in a Veterans Affairs Long-term Care Facility

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Background. It is unknown if suprapubic catheters (SCs) offer benefit over indwelling urethral catheters (IUCs) in incidence of asymptomatic bacteriuria and catheter-associated infection (CAUTI), or subsequent antibiotic exposure.

Methods. We conducted a retrospective cohort study of unique patients with SCs placed at VA Pittsburgh Healthcare System from February 2015 to March 2018, who had a prior IUC (≥30 days for each). Demographic, laboratory, microbiologic, and antibiotic use data were compared over the same number of days between IUC and SC periods. IDSA Guidelines were used to define CAUTI and asymptomatic bacteriuria.

Results. Eighteen patients with SC were included. SCs were in place for a median of 213 days (range: 49–1,085). The indications for catheterization were urinary retention (n = 12), neurogenic bladder (n = 5), and decubitus healing (n = 1). The most common underlying conditions were benign prostatic hyperplasia (n = 9), multiple sclerosis (n = 2), and Parkinson's disease (n = 2). The median number of urine cultures collected per 100 IUC and 100 SC days were 2.28 (range: 0–4.08) and 0.35 (range: 0–5.85), respectively (P = 0.02). Forty-four percent (8/18) and 39% (7/18) received at least one antibiotic course for asymptomatic bacteriuria during IUC and SC periods. A total of 170 days of antibiotic therapy were given for asymptomatic bacteriuria per 4,881 IUC days vs. 107 days for asymptomatic bacteriuria per 4,881 SC days (P = 0.0001). The median rate of CAUTI was 0.25 per 100 IUC days vs. 0.08 per 100 SC days (P = 0.15). The most common pathogens causing CAUTIs were *Pseudomonas aeruginosa* (n = 5), *Candida albicans* (n = 2), *Klebsiella pneumoniae* (n = 1) and *Enterococcus faecalis* (n = 1). A total of 163 days of antibiotic therapy were given for CAUTI per 4,881 IUC days vs. 38 days of antibiotic therapy for CAUTI per 4,881 SC days (P < 0.0001).

Conclusion. SCs were associated with significantly less overall antibiotic exposure than IUCs, both as treatment of CAUTIs and as inappropriate agents against asymptomatic bacteriuria. CAUTI rates were similar among patients with SCs and IUCs, although cultures were performed more often in those with IUCs. Reducing the treatment of asymptomatic bacteriuria remains a leading stewardship challenge.

Disclosures. **All authors:** No reported disclosures.

1530. De-implementation Strategy to Reduce the Inappropriate Use of Urinary and Intravenous CATheters: the RICAT Study

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Session: 150. Urinary Tract Infection

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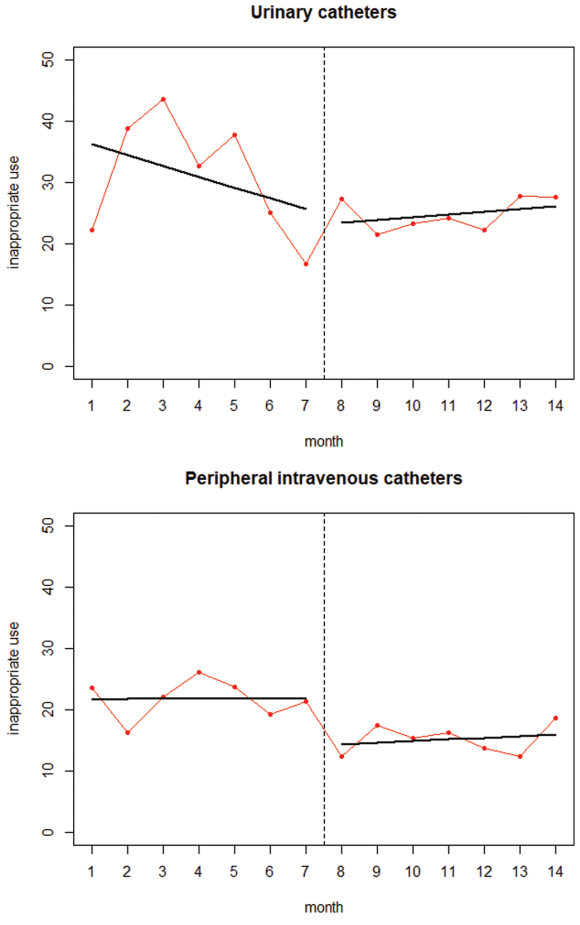
Background. Catheter-associated urinary tract infection (UTI) and catheter-associated bloodstream infection (BSI) are common healthcare-associated infections (HAI). Therefore, catheters should only be used if indicated. However, based on the literature up to 65% of the urinary catheters and 56% of the peripheral intravenous catheters have an inappropriate indication. So, an efficient way to reduce HAIs is to avoid unnecessary use of catheters. Our quality improvement project aims to reduce unnecessary use of catheters.

Methods. In a multicenter, interrupted time series study, several interventions to avoid inappropriate use of catheters were carried out in internal medicine and nonsurgical subspecialty wards in seven hospitals in the Netherlands. The indications for catheter use were based on (inter)national guidelines. The primary endpoint is the percentage of inappropriate indications on the day of data collection. Secondary endpoints are catheter-associated infections, length of hospital stay and mortality. Data were collected once per 2 weeks during baseline (7 months) and post-intervention (7 months). Preliminary analyses compared incidence rates before and after the intervention.

Results. Data were obtained from 5,691 observed patients. The rate of inappropriate use of urinary catheters decreased from 32.1 to 23.7% (incidence rate ratio 0.74, 95% CI 0.58–0.94, $P = 0.013$), and inappropriate use of peripheral intravenous catheters decreased from 22.0 to 15.2% (incidence rate ratio 0.69, 95% CI 0.60–0.80, $P < 0.001$). The overall urinary and intravenous catheter use was stable, resp. 12.2% ($n = 324$) to 12.5% ($n = 380$) and 62.8% ($n = 1,665$) to 62.1% ($n = 1,887$). Most inappropriate indications were due to prolonged catheter use. The indications which expire frequently are"Accurate measurements of urinary output in critically ill patients' for urinary and"IV fluids and antibiotic therapy' for intravenous catheters. Subsequent analyses will take into account the interrupted time series design, and evaluate catheter-associated UTI and BSI rates.



Conclusion. Our de-implementation strategy reduces unnecessary use of urinary and intravenous catheters in non-ICUs. It is important to increase awareness for inappropriate use of catheters.

Disclosures. **S. E. Geerlings**, Nordic Pharma: Consultant and Fosfomycin iv, consulting fee.

1531. A CMV Vaccine Based on Non-Replicating Lymphocytic Choriomeningitis Virus Vectors Expressing gB and pp65 Is Safe and Immunogenic in Healthy Volunteers, Allowing for Development of a Phase II Clinical Trial in Living Donor Kidney Transplant Recipients

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Session: 151. Viruses and Bacteria in Immunocompromised Patients

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Background. Cytomegalovirus (CMV) is a major pathogen in pregnancy and immunocompromised patients. Antiviral prophylaxis is limited by toxicities, recurrent infection, and antiviral resistance. A safe and protective CMV vaccine is highly desirable.

Methods. HB-101 is a CMV vaccine consisting of two nonreplicating lymphocytic choriomeningitis virus vectors, one expressing the human CMV antigen pp65 and the other a truncated, more antigenic isoform of the CMV fusion protein gB. The safety and immunogenicity of HB-101 were evaluated in a randomized, placebo-controlled, double-blind phase I dose-escalating trial (NCT02798692). Three dosing cohorts (1: 2.6×10^6; 2: 2.6×10^7 and 3: 2.6×10^8 FFU) of 18 subjects each were enrolled. On Day 0, Month 1, and Month 3, HB-101 or placebo was administered to 14 and 4 subjects, respectively. Immunogenicity studies included cellular responses against pp65, and humoral and cellular responses against gB and the LCMV vector.

Results. Injection site pain was the most frequently reported solicited adverse event (SAE). It affected 57.1% of HB-101 recipients in both cohorts 1 and 2 and 92.9% in cohort 3. Among the general SAE malaise, fatigue and generalized myalgia were most frequently reported. All SAE were generally mild to moderate and lasted <8 days. No serious adverse events and no abnormal lab tests were noted during the active phase of the study. HB-101-induced gB-specific IgG antibody responses at all doses, in a dose-dependent manner. All three dose levels also induced antibodies that neutralized HCMV infection in cultured human fibroblasts (MRC-5 cells), and resulted in a robust, boosterable and durable T-cell response by IFNγ ELISPOT for CMV gB and pp65. Polychromatic flow cytometry indicated induction of a high proportion of polyfunctional CMV-specific CD8 and CD4 T-cells. CD8 T-cells expressing IFNγ, IL2 and TNFα without CD107a were among the most prominent populations induced against CMV pp65.

Conclusion. HB-101 is a novel CMV vaccine with a good safety profile in healthy volunteers, eliciting strong humoral and cellular immune responses. We are starting a Phase 2 trial in kidney transplant candidates at higher risk for CMV infection. We plan to give multiple vaccinations prior to living donor kidney transplant, and will follow post-transplant for safety, immunogenicity, and efficacy.

Disclosures. **C. N. Kotton**, Hookipa: Consultant, Consulting fee and Speaker honorarium. **M. Schwendinge**, Hookipa: Employee, Salary. **G. Thiry**, Hookipa: Consultant, Consulting fee. **B. DeVos**, Hookipa: Consultant, Consulting fee. **F. De Boever**, Hookipa: Consultant, Consulting fee. **G. Leroux-Roels**, Hookipa: Consultant, Consulting fee. **A. Lilja**, Hookipa: Employee, Salary.

1532. Increased Risk of Bacterial, Fungal and Other Viral Infections During CMV Infection: Decreased Cytokine Production in Response to Toll-Like Receptor Ligands

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Session: 151. Viruses and Bacteria in Immunocompromised Patients

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Background. In the solid-organ transplant (SOT) setting, CMV is an immunomodulatory virus that indirectly increases the risk for bacterial, fungal and viral infections. However, the pathogenesis of this phenomenon is poorly understood. The aim of our study was to determine whether inflammatory responses to different Toll-like receptor ligands are blunted during CMV infection in SOT patients.

Methods. CMV D+/R− SOT patients had blood drawn at the end of CMV prophylaxis and then weekly after onset of CMV viremia. PBMCs were extracted and incubated for 24 hours in the presence of bacterial (LPS), fungal (Zymosan [ZYM]), and viral (Resiquimod [R848]) ligands. Proinflammatory (IL1β), Th1 (IFNγ), Th2 (IL4), immunoregulatory (IL10), and chemotactic (MCP1) cytokines were measured in the supernatant by multiplex ELISA.

Results. Thirty-eight SOT patients were followed for at least 9 months. Patients who developed subsequent CMV infection had lower cytokines in response to bacterial, fungal and viral ligands (LPS, ZYM, and R848) at the end of prophylaxis compared with those with no CMV infection. These results were independent of immunosuppression and peripheral blood cell counts. Specifically, these trends were significantly different with respect to IFNγ, IL1β, and IL10 production in response to