model. ROC AUC in Figure 1 was 0.691 for Tumbarello and 0.670 for Duke. With a 2-point cutoff, sensitivity for Tumbarello was 71% and specificity 61%, for Duke 58% and 75%, increasing cutoff to 4 points increases specificity to 87 and 93%, decreasing sensitivity to 35 and 20%, respectively. Table 2 classifies by type of UTI, shows the percentage of adequate initial antibiotic for ESBL, and the number of cases predicted by each model. Tumbarello's model predicts all cases, while Duke's model predicts most cases of cystitis and pyelonephritis and all cases of complicated UTI and urosepsis.

**Conclusion.** Clinical scoring models have a high specificity identifying best non-ESBL infections, this aids in the choice of a more adequate empirical antibiotic for community-acquired UTI.

### Table 1

| Variable                   | β-Coefficient | P     | Confidence Interval 95% |
|----------------------------|---------------|-------|-------------------------|
| Recent antibiotic therapy  | 0.23          | <0.001| 0.16–0.35               |
| Diabetes mellitus          | 0.17          | <0.001| 0.11–0.32               |
| Previous hospitalization   | 0.16          | <0.001| 0.10–0.32               |
| Connective tissue disease  | 0.11          | 0.014 | 0.06–0.48               |
| Complicated UTI            | 0.11          | 0.017 | 0.02–0.19               |

![Figure 1](image-url)

**Table 2**

| Type of UTI/Initial Antibiotic | ESBL E. coli | Non-ESBL E. coli | Tumbarello | Duke |
|-------------------------------|--------------|-----------------|------------|------|
| Cystitis                      | 62           | 118             | 87         | 60   |
| Nitrofurantoin o fosfomycin   | 10%          | 5%              | 8%         | 5%   |
| Pyelonephritis                | 77           | 140             | 89         | 71   |
| Carbapenem                    | 58%          | 31%             |            |      |
| Complicated UTI               | 89           | 93              | 126        | 89   |
| Carbapenem                    | 56%          | 42%             |            |      |
| Urosepsis                     | 40           | 40              | 64         | 45   |
| Carbapenem                    | 65%          | 78%             |            |      |

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

1513. A New Method for Rapid Phenotypic Antimicrobial Susceptibility Testing Directly from Patient Samples

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**Session:** 150. Urinary Tract Infection

**Friday, October 5, 2018: 12:30 PM**

**Background.** Life-threatening syndromic hospital infections including sepsis, ventilator acquired pneumonia, catheter-associated urinary tract infection (CAUTI), and surgical site infections are often caused by multidrug-resistant pathogens. Implementing the targeted narrow-spectrum antimicrobial therapy as rapidly as possible at the onset of infection is critical for lowering morbidity and mortality for these infections. We present the new MultiPath technology for rapid syndromic infection detection, pathogen identification, and phenotypic antimicrobial susceptibility testing (AST). Our feasibility data demonstrate the technology’s potential application as a rapid CAUTI diagnostic.

**Methods.** The MultiPath technology detects and counts cells in a 30-minute assay using nonmagnified digital imaging. For identification, target pathogen cells are labeled using fluorescent in situ hybridization (FISH) with rRNA-specific probes, tagged with magnetic nanoparticles, deposited on a surface, imaged, and quantified. For AST, samples are mixed with growth medium, incubated for 4 hours in the presence of serial dilutions of antibiotics, FISH-labeled, magnetically selected, and quantified by digital imaging. The MultiPath assays use a dye-cation layer to optically sequester the sample preparation and wash steps. The MultiPath technology detects and counts cells in a 30-minute assay using nonmagnified digital imaging. For identification, target pathogen cells are labeled using fluorescent in situ hybridization (FISH) with rRNA-specific probes, tagged with magnetic nanoparticles, deposited on a surface, imaged, and quantified. For AST, samples are mixed with growth medium, incubated for 4 hours in the presence of serial dilutions of antibiotics, FISH-labeled, magnetically selected, and quantified by digital imaging. The MultiPath assays use a dye-cation layer to optically sequester the sample preparation and wash steps.

**Disclosures.** All authors: No reported disclosures.
515. Patient-Based Stratification of Weighted-Incidence Syndrome Antibiotic (WISCA) for Empiric Antibiotic Prescribing
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Session: 150. Urinary Tract Infection
Friday, October 5, 2018: 12:30 PM
Background. Antibiotics are often stratified by location (e.g., ICU) to better assess resistance risk of patients in those locations (1). A weight-based incidence syndrome antibiotic (WISCA) may be more useful for empiric prescribing in that it stratifies on syndrome (urinary tract infection (UTI)) and calculates coverage over all organisms (i.e., weighted incidence). Here we explore the impact of stratification by admission location and patient-specific factors. We suggest that with the availability of patient data from EHRs historic microbiology data can be stratified by syndrome and patient-level factors, making them available for empiric decision support.

Methods. The cohort included patients admitted from November 1, 2011 to July 1, 2016, with a positive urine culture in the first 48 hours and a diagnosis of UTI. Data on admission from a nursing facility (SNF), intensive care unit (ICU) stay in the first 24 hours of admission and antibiotic use in the last 30 days were extracted from the local data warehouse. Expert consensus enriched the susceptibility information that was not reported for organism-antibiotic pairs. The most recent admission for each patient was included. Antibiotic coverage was compared between strata by a chi-square test.

Results. Of the 6,366 patients with UTI, 13% were admitted to an ICU; 8% were admitted from an SNF and 44% had exposure to antibiotics in the last 30 days. Antibiotic coverage did not significantly differ between ICU and non-ICU patient admissions. However, those admitted from an SNF and those admitted with antibiotic exposure in the past 30 days had lower levels of coverage to all antibiotics under study.

Conclusion. Our findings suggest that stratifying by patient factors, easily obtainable from the EHR, may provide more useful empiric prescribing information than stratifying by ICU location.

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Disclosures. All authors: No reported disclosures.

1516. Evaluating Appropriate Antimicrobial Selection and Duration of Therapy for Urinary Tract Infections in Outpatient Clinics
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Session: 150. Urinary Tract Infection
Friday, October 5, 2018: 12:30 PM
Background. Each year in the United States, ~97 million outpatient visits result in the prescription of an antibiotic. However, there is limited data describing prescribing practices for urinary tract infections (UTIs) in outpatient clinics. We aimed to describe the prescribing patterns for UTIs among varied provider groups and clinic subspecialties, in order to improve targeted interventions to improve antibiotic use.

Methods. This retrospective study included patients from January 1, 2016 through December 2016 within a large academic healthcare system presenting to 30 clinics, including family medicine, general medicine, urology, gynecology, and OB/GYN. Patients were included if they had a diagnosis of lower tract UTI (ICD-10 codes for acute cystitis (N30) and cystitis with or without hematuria (N30.90–91)). Exclusions included pregnancy, prophylaxis prior to urology procedure, antibiotics not prescribed, or antibiotic prophylaxis. Patients were categorized as complicated vs. uncomplicated based on additional ICD-10 codes for uncomplicated diabetes, urinary obstruction, flank pain, renal failure, gender, and receiving immunosuppression. Additionally, patient allergies were evaluated to assess adherence to guidelines (Figure 1). The primary objective was to describe prescriber compliance with institutional UTI guidelines for both drug selection and duration.

Results. From 30 clinics, 1,488 patient encounters for UTI were included. The overall compliance rate was 9.5% for appropriate drug selection and duration of therapy, with appropriate antibiotic prophylaxis in 22.8% being much lower than appropriate duration (84.9%). The most commonly prescribed antibiotics included trimethoprim/sulfamethoxazole (31.8%), FQs (23.2%) and nitrofurantoin (21.7%). Compliance rates varied widely between prescriber types (Figure 2).

Conclusion. Management of UTIs in outpatient clinics is suboptimal, and would benefit from antimicrobial stewardship interventions. Stewardship efforts in outpatient clinics should target both appropriate drug selection and duration, and de-emphasize FQ use.

Figure 1. Michigan medicine guidelines for empiric outpatient UTI treatment.