Improvement Program categories, but New York City counties were not grouped. FQ was analyzed at the state and regional level and was defined as the total # of antibiotic prescriptions / total # of antibiotic prescriptions with the diagnostic code for cystitis. χ² test and Risk Ratios (RR = 2017 FFQ/2016 FFQ) were used to compare 2016 and 2017 FQs for the state and for each region using SAS v 9.3 (α = 0.05).

Results. 56,658 antibiotic prescriptions were written for Medicare beneficiaries diagnosed with cystitis in NYS. The statewide FFQ decreased by 14% from 35.9% in 2016 to 31.0% in 2017 (RR: 0.86 [95% CI: 0.84 – 0.88], P < 0.001). FFQ decreased significantly in 11 of 15 regions (P < 0.05, Figures 1 and 2). The median (IQR) FFQ RR for the regions was 0.83 (0.81, 0.87) (Figure 3). The regions (RR [95% CI]) with the largest decrease were Bronx (0.78 [0.67,0.91]), Finger Lakes (0.80 [0.71,0.89]) and Central New York (0.81 [0.72,0.91]). Limited or no changes were observed in Brooklyn (1.01 [0.94, 1.09]), Queens (0.97 [0.88, 1.06]) and Staten Island (0.95 [0.79, 1.13]).

Conclusion. On a statewide level, there were significant decreases in FFQ for cystitis in older adults in 2016 compared with 2016. Nevertheless, up to a third of cystitis prescription was inappropriate in 2017. Limited or no changes were observed in 3 regions. FFQ decreased significantly in 11 of 15 regions (P < 0.05, Figures 1 and 2). The median (IQR) FFQ RR for the regions was 0.83 (0.81, 0.87) (Figure 3). The regions (RR [95% CI]) with the largest decrease were Bronx (0.78 [0.67,0.91]), Finger Lakes (0.80 [0.71,0.89]) and Central New York (0.81 [0.72,0.91]). Limited or no changes were observed in Brooklyn (1.01 [0.94, 1.09]), Queens (0.97 [0.88, 1.06]) and Staten Island (0.95 [0.79, 1.13]).

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1106. Assessment of Fluoroquinolone Appropriateness for Hospitalized Patients with Asymptomatic Bacteriuria and Cystitis: A Multi-Hospital Cohort Study
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Background. Fluoroquinolones increase the risk of Clostridioides difficile infection and antibiotic resistance, but are frequently used for hospitalized patients with bacteriuria. We assessed patterns and predictors of inappropriate fluoroquinolone (FQ) use among hospitalized patients with asymptomatic bacteriuria (ASB) and cystitis.

Methods. This is a retrospective cohort study of non-ICU medicine patients with ASB or cystitis (complicated or uncomplicated) from January 2018 to March 2019 at 43 Michigan hospitals. Patients with concomitant infections, bacteremia, or pyelonephritis were excluded. Each day of FQ (ciprofloxacin, levofloxacin) use (inpatient and post discharge) was assessed for appropriateness. FQ use was inappropriate if: (A) ASB, (B) urine culture with an FQ-resistant bacteria, (C) a safer alternative empiric or definitive antibiotic (treatment ≥ 2 days after urine culture collection) based on disease severity, cultures, allergies, and renal function, or (D) excess duration (>7 days complicated cystitis; >3 days uncomplicated cystitis). Hospitals were also surveyed on existing stewardship (ASP) practices targeting FQ use. ASP practices associated with inappropriate FQ use were evaluated using logistic generalized estimated equation models adjusting for patient factors and hospital clustering.

Results. Of 4849 included patients with ASB (39.7%) or cystitis (60.3%), 21.9% (n = 1063) received an FQ and 9.2% (n = 94) received an inappropriate FQ use (Figure 1). Of 5,465 FQ days of therapy (DOT), 90.7% (n = 4,959) were inappropriate. Definitive treatment of complicated cystitis led to the greatest proportion of inappropriate FQ DOTs (50.6%), followed by ASB (36.4%) (Table 1). Hospitals varied (Figure 2), but those with cascade reporting of antibiotic susceptibilities had lower inappropriate FQ treatment rates (Table 2).

Conclusion. Hospitalized patients with ASB and cystitis often receive an FQ. Most FQ use is inappropriate due to ASB treatment or FQ use for complicated cystitis despite the ASC guidance. Antibiotic susceptibility reporting can be used by ASP to reduce inappropriate FQ use.

Table 1. Reasons for Inappropriate Fluoroquinolone Treatment

| Reason for Inappropriate Fluoroquinolone (FQ) treatment | Patients Treated with an FQ Inappropriately: N (%) | Inappropriate FQ Days of Therapy (DOT): N=4959 |
|--------------------------------------------------------|--------------------------------------------------|-----------------------------------------------|
| Asymptomatic Bacteriuriaa | 345 (27.1%) | 1806 (36.4%) |
| Cystitis (Complicated and Uncomplicated)b | 619 (62.5%) | 3153 (63.6%) |
| Complicated Cystitisc | 560 (56.9%) | 2809 (57.6%) |
| Empiric Treatmentd | 320 (22.4%) | 308 (6.2%) |
| Definitive Treatmente | 498 (50.6%) | 2509 (50.6%) |
| Excess Treatment Durationf | 118 (11.8%) | 1011 (20.4%) |
| Uncomplicated Cystics | 59 (6.0%) | 283 (4.7%) |
| Empiric Treatmentg | 28 (2.0%) | 25 (0.5%) |
| Definitive Treatmenth | 55 (5.6%) | 257 (5.2%) |
| Excess Treatment Durationi | 38 (3.7%) | 231 (4.6%) |

Patients with a positive urine culture and no signs or symptoms attributable to a urinary tract infection were considered to have asymptomatic bacteriuria. Uncomplicated cystitis consisted of women without a urinary catheter and no reported or categorized risk factors, that was not complicated or another condition associated with UTI. Cystitis was included in all men and any women with immunosuppression, urologic conditions, urinary catheter, or other co-morbid conditions precluding categorization as uncomplicated cystitis.

a Empiric FQ treatment includes days of therapy from the start of therapy to 1 day after urine culture collection
b Definitive FQ treatment includes days of therapy occurring ≥ 2 days after urine culture collection
c Excess Treatment Duration of DOT includes days of therapy occurring after expected treatment duration. Expected treatment duration is 7 days for complicated cystitis and 3 days for uncomplicated cystitis.
d Empiric FQ treatment includes days of therapy from the start of therapy to 1 day after urine culture collection
e Excess Treatment Duration of DOT includes days of therapy occurring after expected treatment duration. Expected treatment duration is 7 days for complicated cystitis and 3 days for uncomplicated cystitis.

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Table 2. Multivariable Model of Antimicrobial Stewardship Practices Associated with Inappropriate Fluoroquinolone Use in Patients with Asymptomatic Bacteriuria and Cystitis, N=1061 Patients

| Variable                        | OR (95% CI) | P-value ** |
|---------------------------------|-------------|------------|
| Cultures with Cascade           | 0.67 (0.53-0.86) | 0.002 |
| Reporting of Antibiotic Susceptibilities|          |           |
| Prospective Audit and Feedback of Fluoroquinolones¹ | 0.55 (0.41-0.74) | <0.0001 |
| Institutional UTI Contact       | 0.76 (0.60-0.98) | 0.03 |
| Infection Treatment Guideline   |              |           |

¹ Includes Levofloxacin and Ciprofloxacin
** P < 0.05 is considered significant
CI: confidence interval, OR: odds ratio; Multivariable model adjusted for hospital-level clustering and patient factors significant in the multivariable model (including urinary catheter and urine culture with >100,000 colony forming units of bacteria)

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1108. Impact of Implementing a Urine Culture Order Set on Antibiotic Utilization and Rates of Catheter-Associated Urinary Tract Infections in an Urban Academic Medical Center

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Background. Overutilization of urine cultures may lead to inappropriate use of antibiotics. We implemented a computerized urine culture order set where urine specimens are not processed for culture unless there is evidence of pyuria (210 WBC per high power field) on urinalysis (UA), or if a patient is pregnant, neutropenic, neonate, renal transplant recipient, planned for or had a recent urologic procedure. Here we evaluated the impact of this order set on antibiotic utilization, urine culture volumes and rates of catheter-associated urinary tract infections (CAUTI).

Methods. We performed a retrospective chart review before and after the order set implementation (August–December 2017 and 2018, respectively). The analysis had two distinct components: first was at institution-level, where data for all adult and pediatric inpatients were compared for urine culture volumes and antibiotic use regardless of indication. The second component was done at patient-level, where we compared clinical data and days of therapy (DOT) for all adult inpatients who had urine cultures without pyuria post-intervention.

Results. At the institution-level analysis, a statistically significant reduction was observed in rates of urine cultures performed (P = 0.02), as well as use of penicillins, carbapenems and Trimethoprim-Sulfamethoxazole (TMP-SMX) (P < 0.05). However, the use of cefalosporins has increased post-intervention (P < 0.001). No significant change was noted for aminoglycosides or fluoroquinolones.

At the patient-level analysis, DOT means in patients with negative pyuria did not change significantly (5.16 pre-intervention, 6.54 post-intervention, P = 0.202). Prevalence of treatment for bacteriuria despite absence of pyuria was 5.3% (20/380) pre-intervention, vs. 1.9% (1/53) post-intervention (P = 0.494). In the pre-intervention period, three cases met the criteria for CAUTI despite negative pyuria. This misdiagnosis could have been avoided by implementation of the urine culture order set.

Conclusion. Implementation of a urine culture order set in our institution led to a statistically significant reduction in rates of urine cultures performed, as well as use of penicillins, carbapenems and TMP-SMX.