Chicago Medicine, Chicago, Illinois

Session: 135. Antibiotic stewardship: Surgical Prophylaxis
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Background. Surgical site infection (SSI) is a common complication among patients undergoing solid-organ transplantation. Administration of perioperative antimicrobials is one modifiable factor that may reduce the risk of SSIs. We sought to evaluate antimicrobial stewardship efforts to improve concordance of perioperative antimicrobial selection (AS) and dose timing (DT) with the institution's perioperative antimicrobial guidelines among liver (LVR) and lung transplant recipients (LNG).

Methods. This was a single-center, observational study of LVR and LNG between January 1, 2017 and December 31, 2018. Patients receiving antimicrobials for the treatment of infection immediately prior to transplant were excluded. Throughout the study period, several interventions were performed, including: updating AS and DT protocols (2017 Q2) and preoperative order sets (2017 Q4), improving availability of antibiotics in the operating room (2018 Q1), and most recently developing a guideline and providing education for intraoperative redosing based on renal function (2018 Q3). The primary outcome was overall guideline concordance (GC). This was a composite endpoint including preoperative and intraoperative AS and DT, based on the institution's guideline. Secondary outcomes included SSI rates based on the CDC National Healthcare Safety Network definition and rate of new *C. difficile* or vancomycin-resistant Enterococci infection or colonization.

Results. Among 112 patient screened, 79 patients were included (45 LNG and 34 LVR). The median age was 60 years and BMI was 26.5 kg/m^2. The median procedure length was 7.8 hours for LNG and 6.9 hours for LVR. Results are shown in Table 1, Figure 1 and Figure 2. All GC rates demonstrate improvements over time, except for intraoperative DT for LNG.

Conclusion. Limited by a small sample size, our study demonstrates that noninvasive antimicrobial stewardship strategies can yield improvements in GC.

Table 1. Overall Rates of Perioperative Antimicrobial Prophylaxis Guideline Concordance

	All (N=79)	Lung (N=45)	Liver (N=34)
GC	35 (0, 60)	33 (0, 80)	38 (0, 83)
Preoperative AS	68 (31, 92)	73 (40, 100)	62 (0 (86)
Preoperative DT	85 (64, 100)	87 (67, 100)	82 (50, 100)
Intraoperative AS	82 (55, 100)	69 (44, 100)	100 (100, 100)
Intraoperative DT	56 (27, 80)	49 (0, 100)	65 (0, 100)
SSI	15 (0, 31)	11 (0, 40)	21 (0, 50)

Data are shown as percent across study period (quarterly range).

Figure 1. Lung Transplant Guideline Concordance

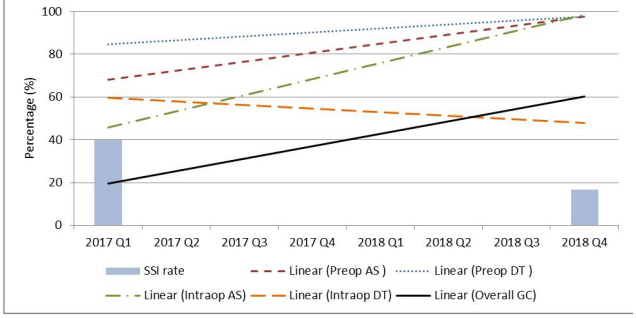
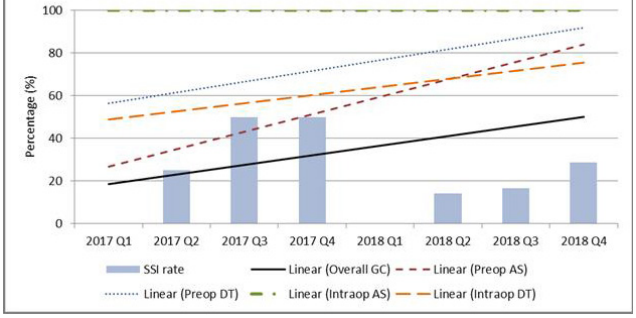


Figure 2. Liver Transplant Guideline Concordance



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

1104. Antibiotic Prophylaxis for the Endoscopic Endonasal Approach

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Background. Evidence available to guide perioperative antibiotic prophylaxis for endoscopic endonasal (EEN) procedures remains limited. The primary objective of this study was to characterize the impact of antibiotic prophylaxis on the incidence of post-operative central nervous system (CNS) or sinonasal infections in patients undergoing EEN procedures.

Methods. This was an IRB-approved descriptive analysis including patients >18 years of age who underwent EEN surgery at AdventHealth Orlando over a 3-year period. Patients were excluded if they had an infection present prior to surgery, ongoing antibiotic treatment (other than surgical prophylaxis) at the time of surgery, or a basic sinonasal surgery which lacked CNS penetration. The primary endpoint assessed was the rate of CNS or sinonasal infection within 30 days of EEN procedure.

Results. After screening 160 patient encounters, a total of 118 patients were included. The most common antibiotic prophylaxis utilized was ceftriaxone, followed by cefazolin, or alternative/combination therapy (72.8% vs. 13.6% vs. 13.6% of cases, respectively). There were 4 total patients who met the primary endpoint, and all 4 cases were due to a diagnosis of meningitis (overall rate 3.4%). Infection rate by antibiotic prophylaxis was 2.4% for ceftriaxone, 0% for cefazolin, and 14.3% for alternative/combination therapy. Based upon the retrospective nature of this study, we were unable to account for provider preference in selection of surgical prophylaxis or other surgeon-specific factors.

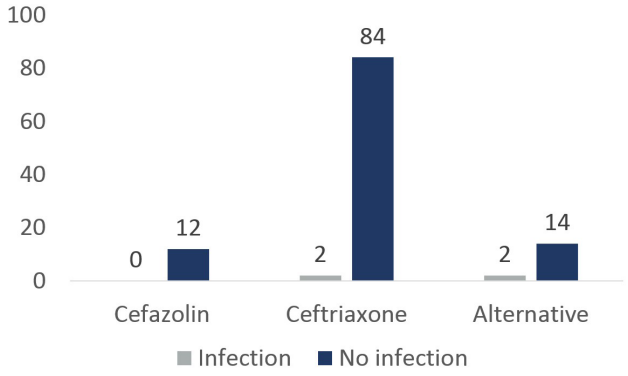
Conclusion. In this retrospective descriptive analysis, rates of CNS or sinonasal infections occurred at a rate similar to previously published literature. Larger, prospective studies are warranted to evaluate the impact of antibiotic selection on the rate of CNS or sinonasal infections post-EEN procedures.

Table 1: Cases of Infection Post-EEN Surgery

Patient	Age	Gender	Surgeon	Antibiotic	Complication	Organism Isolated*	Time to Infection (days)
1	51	Female	A	Cefazolin + ceftriaxone	Meningitis	none	11
2	30	Female	C	ceftriaxone	Meningitis	*Staphylococcus epidermidis*	4
3	40	Female	B	Cefazolin + clindamycin	Meningitis	none	26
4	56	Male	C	ceftriaxone	Meningitis	none	10

*Patients without an organism identified were included if they had a clinical diagnosis of meningitis at the time of their CSF culture, as well as receipt of broad-spectrum antibiotics prior to CSF culture

Figure 1: Infection Distribution by Antibiotic



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

1105. Statewide, Retrospective, Cohort Study of Medicare Part B Quinolone Prescribing for Cystitis in 2016–2017

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Background. Quinolones (FQ) are no longer recommended as first-line therapy for cystitis. In 2016, the FDA released a safety communication advising FQ restriction in the treatment of uncomplicated urinary tract infection unless no other options are available. However, little is known about the frequency of FQ (FFQ) prescribing in older adults (OA) receiving antibiotics for cystitis in New York State (NYS). This study compared the FFQ prescribing in OA receiving antibiotics with a diagnosis of cystitis in NYS between 2016 and 2017.

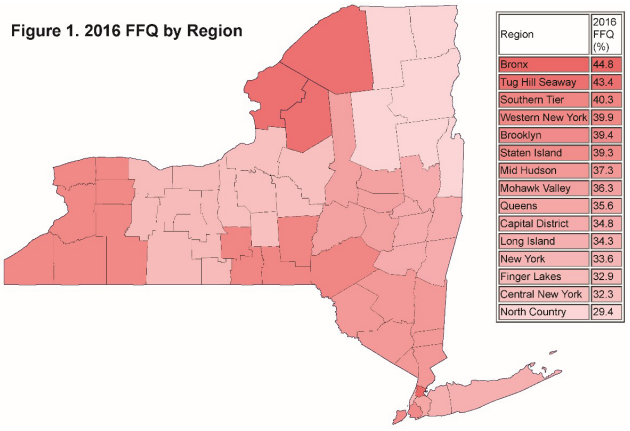
Methods. Retrospective, cohort study of (NYS) Part B Medicare fee-for-service beneficiaries in 2016 and 2017 with diagnosis codes for cystitis. All antibiotics prescribed ≤ 3 days after visit were analyzed. FQ were defined as ciprofloxacin, gemifloxacin, levofloxacin, moxifloxacin, norfloxacin, ofloxacin. County-wide data were aggregated into regional data per NYS Department of Health Population Health

Improvement Program categories, but New York City counties were not grouped. FFQ was analyzed at the state and regional level and was defined as the total # of FQ prescriptions / total # of antibiotic prescriptions with the diagnostic code for cystitis. χ^2 test and Risk Ratios (RR = 2017 FFQ/2016 FFQ) were used to compare 2016 and 2017 FFQs for the state and for each region using SAS v 9.3 (α = 0.05).

Results. 50,658 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]).

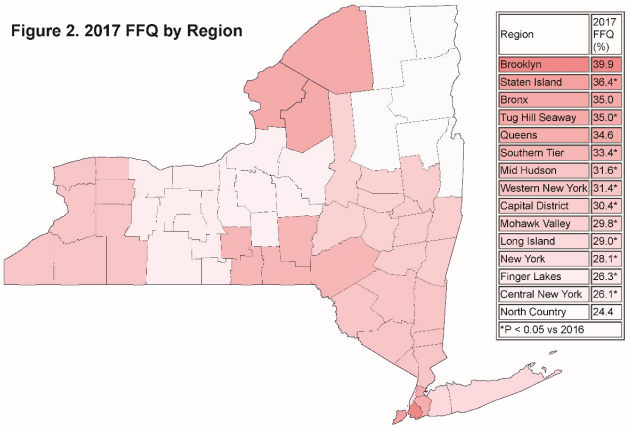
Conclusion. On a statewide level, there were significant decreases in FFQ for cystitis in older adults in 2017 compared with 2016. Nevertheless, up to a third of cystitis prescription were for FQ. Future studies should evaluate the appropriateness of FQ for cystitis in OA.

Figure 1. 2016 FFQ by Region



Region	2016 FFQ (%)
Bronx	44.8
Tug Hill Seaway	43.4
Southern Tier	40.3
Western New York	39.9
Brooklyn	39.4
Staten Island	39.3
Mid Hudson	37.3
Mohawk Valley	36.3
Queens	35.6
Capital District	34.8
Long Island	34.3
New York	33.6
Finger Lakes	32.9
Central New York	32.3
North Country	29.4

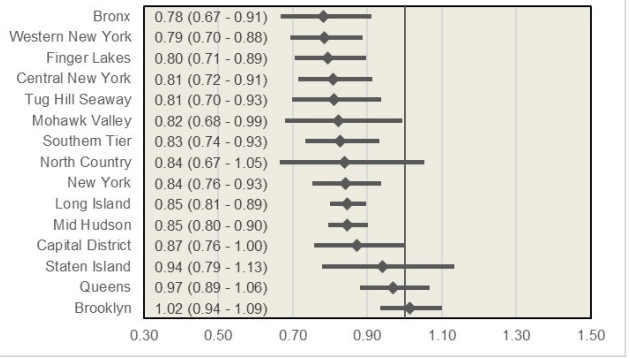
Figure 2. 2017 FFQ by Region



Region	2017 FFQ (%)
Brooklyn	39.9
Staten Island	36.4*
Bronx	35.0
Tug Hill Seaway	35.0*
Queens	34.6
Southern Tier	33.4*
Mid Hudson	31.6*
Western New York	31.4*
Capital District	30.4*
Mohawk Valley	29.8*
Long Island	29.0*
New York	28.1*
Finger Lakes	26.3*
Central New York	26.1*
North Country	24.4

*P < 0.05 vs 2016

Figure 3. 2017 to 2016 FFQ Ratio Stratified by Region



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

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 = 1,061) received an FQ and 92.7% (n = 984) received a, FQ inappropriately (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, urinary tract infection (UTI) treatment guideline or an ASP performing prospective audit and feedback on FQ use 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 option of an alternative antibiotic. Prospective audit and feedback, UTI guidelines, and cascade reporting of antibiotic susceptibilities can be used by ASP to reduce inappropriate FQ use.

Figure 1. Appropriateness of Fluoroquinolone Treatment in Patients with Asymptomatic Bacteriuria and Cystitis

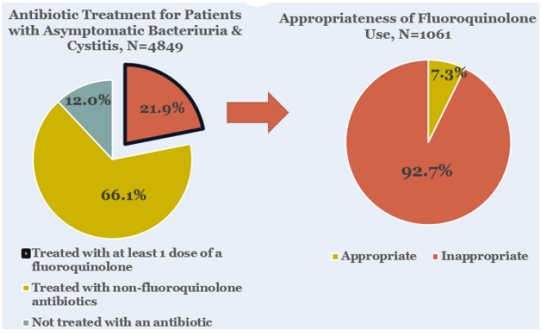

Table 1. Reasons for Inappropriate Fluoroquinolone Treatment

Reason for Inappropriate Fluoroquinolone (FQ) treatment	Patients Treated with a FQ Inappropriately; N (%) (N=984)	Inappropriate FQ Days of Therapy; DOT (%) (N=4959)
Asymptomatic Bacteriuria[1]	365 (37.1%)	1806 (36.4%)
Cystitis (Complicated and Uncomplicated)[1]	619 (62.9%)	3153 (63.6 %)
Complicated Cystitis*	560 (56.9%)	2868(57.8%)
Empiric Treatment[2]	220 (22.4%)	309 (6.2%)
Definitive Treatment[3]	498 (50.6%)	2509 (50.6%)
Excess Treatment Duration[4]	116 (11.8%)	1011 (20.4%)
Uncomplicated Cystitis*	59 (6.0%)	285 (5.7%)
Empiric Treatment[2]	20 (2.0%)	25 (0.5%)
Definitive Treatment[3]	55 (5.6%)	257 (5.2%)
Excess Treatment Duration[4]	36 (3.7%)	211 (4.3%)

[1]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 or comorbid conditions associated with complicated cystitis. Complicated cystitis included all men and any women with immunosuppression, urologic conditions, urinary catheter, or other co-morbid conditions precluding categorization as uncomplicated cystitis.
[2] Empiric FQ treatment includes days of therapy from the start of therapy to 1 day after urine culture collection
[3] Definitive FQ treatment includes days of therapy occurring ≥2 days after urine culture collection
[4] Excess Treatment Duration of FQ includes days of therapy occurring after expected treatment duration. Expected treatment duration is 7 days for complicated cystitis and 3 days for uncomplicated cystitis.
*Types of treatment for cystitis are not mutually exclusive. A patient could receive a fluoroquinolone inappropriately for empiric, definitive and an excess treatment duration. For inappropriate FQ days of therapy (DOT), definitive and excess treatment duration are not mutually exclusive. A FQ DOT could be inappropriate definitive treatment and also inappropriate due to excess duration.