

# Healthcare utilization outcomes of patients prescribed fluoroquinolones on discharge from the hospital to nursing homes

Tyler L. Lantz BS,<sup>1</sup> Brie N. Noble BS,<sup>1</sup> Christopher J. Crnich MD PhD,<sup>2,3</sup> Jessina C. McGregor PhD,<sup>1</sup> David T. Bearden PharmD,<sup>1,4</sup> Dominic Chan PharmD,<sup>5</sup> Jon P. Furuno PhD<sup>1</sup>  
 1. Oregon State University College of Pharmacy (Portland, OR), 2. William S. Middleton Veterans Hospital (Madison, WI), 3. University of Wisconsin School of Medicine and Public Health (Madison, WI), 4. Oregon Health & Science University Hospitals and Clinics (Portland, OR), 5. Legacy Health (Portland, OR)



## INTRODUCTION

- Up to 75% of antibiotic use in nursing homes may be inappropriate
- However, nursing home antibiotics are frequently initiated in hospitals prior to nursing home admission
- Fluoroquinolones are frequently used and prescribed in nursing homes despite FDA warnings for delirium, tendon rupture, abdominal aortic aneurysm, QT prolongation, serious hypoglycemia, and neuropathy
- Nursing home residents are particularly susceptible to adverse drug reactions, driven by intense polypharmacy and heavy comorbidity burden
- Additional concerns with this practice include broad spectrum antibiotic selective pressure and increased risk of *Clostridioides difficile* infection

## OBJECTIVES

- Determine the frequency and characteristics of patients discharging from the hospital to nursing homes who are prescribed fluoroquinolone antibiotics
- Evaluate the frequency of healthcare utilization outcomes among these patients including 30-day emergency department (ED) visit or 30-day inpatient admission to the index facility post-discharge

## METHODS

### Design and Patient Setting

- Retrospective cohort study of adult (age ≥ 18 years) inpatients discharged from Oregon Health & Science University Hospital to a nursing home between January 1, 2016 and December 31, 2018

### Inclusion Criteria

- Inpatients age ≥ 18 years old

### Data Collection

- Data were collected from electronic health record data

### Primary Outcome

- Composite of 30-day ED visit or 30-day admission to the index facility, Oregon Health & Science University Hospital

### Statistical Analysis

- Descriptive statistics included means, standard deviations (SDs), frequencies, and percentages
- Associations were quantified using odds ratios (ORs) and 95% confidence intervals (CIs)

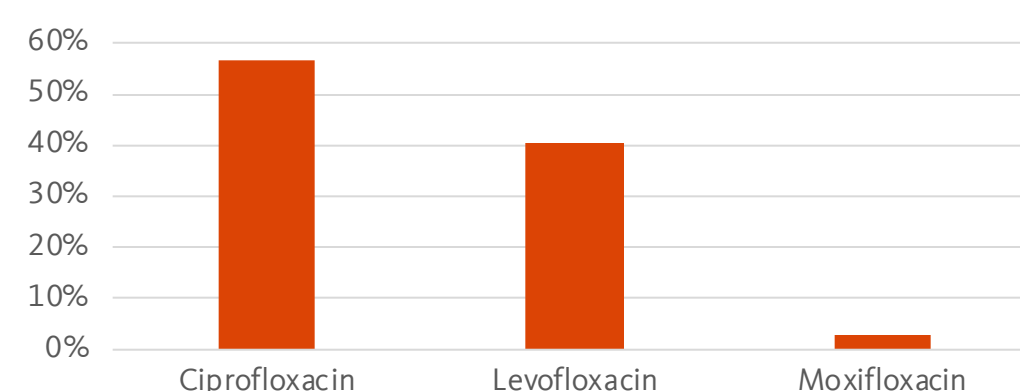
## RESULTS

- 9,546 patients discharged to a nursing home
- 2,410 (25%) prescribed at least one antibiotic
- 423 (17.6%) prescribed a fluoroquinolone
- 276 (65.3%) of those prescribed a fluoroquinolone on discharge experienced a 30-day ED visit or 30-day admission

**Table 1.** Characteristics of patients prescribed a fluoroquinolone antibiotic on hospital discharge to a nursing home (N=423)

Characteristic	N	(%)
Age ≤ 65 years	156	(36.9)
Male sex	224	(53.0)
Infectious Diseases consult ordered	49	(11.6)
Surgical DRG for index admission	147	(34.8)
Length of stay >7 days	210	(49.7)
Comorbidities		
Cancer	129	(30.5)
Chronic pulmonary disease	125	(29.6)
Heart failure	45	(10.6)
Renal disease	110	(26.0)
Liver disease	74	(17.5)
Cerebrovascular disease	99	(23.4)
Dementia	32	(7.6)

**Figure 1.** Fluoroquinolone antibiotics prescribed on hospital discharge to a nursing home (N=423)



## RESULTS

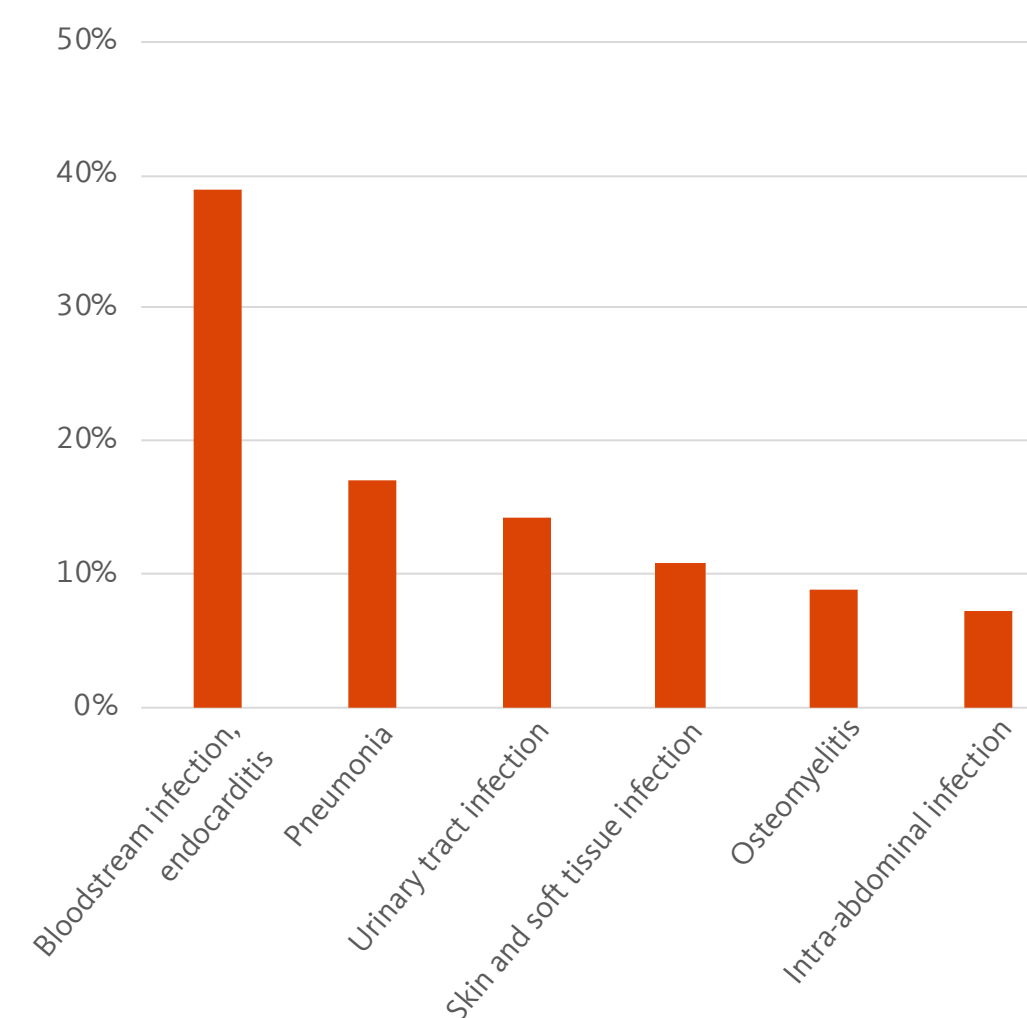
### Treatment characteristics

- The most common fluoroquinolone prescribed on discharge was ciprofloxacin followed by levofloxacin
- Most patients who were prescribed a fluoroquinolone on discharge received >7 days of outpatient antibiotic therapy

### Most frequent infectious diagnoses on discharge

- Bloodstream infection or endocarditis (39%)
- Pneumonia (17%)
- Urinary tract infection (14%)
- Skin and soft tissue infection (11%)
- Osteomyelitis (9%)
- Intra-abdominal infection (7%)

**Figure 2.** Infectious diagnoses of patients who were prescribed a fluoroquinolone antibiotic on discharge (N=423)



### Healthcare utilization outcomes

- Overall, 276 patients (65.3%) experienced an ED visit or inpatient admission to Oregon Health & Science University Hospital within 30 days of being discharged to a nursing home with a fluoroquinolone antibiotic prescription
- Patient characteristics including comorbidities, treatment characteristics, and infectious diagnoses were evaluated for differences between patients who experienced a 30-day ED visit or 30-day admission and those who did not

## RESULTS

**Table 2.** Characteristics of patients prescribed a fluoroquinolone who experienced a 30-day ED visit or 30-day admission (N=276, 65.3%)

Characteristic	Yes N (%)	No N (%)	Unadjusted OR (95% CI)
Age ≤ 65 years	119 (76.3)	157 (58.8)	2.3 (1.4 to 3.5)
Male sex	158 (70.5)	118 (59.3)	1.6 (1.1 to 2.5)
Infectious Diseases consult ordered	35 (71.4)	241 (64.4)	1.4 (0.7 to 2.7)
Surgical DRG for index admission	94 (64.0)	182 (66.0)	0.9 (0.6 to 1.4)
Length of stay >7 days	138 (64.8)	138 (65.7)	1.0 (0.7 to 1.6)
Comorbidities			
Cancer	88 (68.2)	188 (64.0)	1.2 (0.8 to 1.9)
Chronic pulmonary disease	82 (65.6)	194 (65.1)	1.0 (0.7 to 1.6)
Heart failure	35 (77.8)	241 (63.8)	2.0 (0.96 to 4.1)
Renal disease	82 (74.6)	194 (62.0)	1.8 (1.1 to 2.9)
Liver disease	55 (74.3)	221 (63.3)	1.7 (0.95 to 3.0)
Cerebrovascular disease	70 (70.7)	206 (63.6)	1.4 (0.8 to 2.3)
Dementia	16 (50.0)	260 (66.5)	0.5 (0.2 to 1.0)
Treatment characteristics			
Received prescription for ciprofloxacin	161 (67.1)	115 (62.8)	1.2 (0.8 to 1.8)
Prescribed days of therapy >7 days	111 (69.8)	165 (62.5)	1.4 (0.9 to 2.1)
Infectious diagnosis			
Bloodstream infection, endocarditis	110 (66.7)	166 (64.3)	1.1 (0.7 to 1.7)
Pneumonia	42 (58.3)	234 (66.7)	0.7 (0.4 to 1.2)
Urinary tract infection	39 (65.0)	237 (65.3)	1.0 (0.6 to 1.8)
Skin and soft tissue infection	34 (73.9)	242 (64.2)	1.6 (0.8 to 3.2)
Osteomyelitis	30 (81.1)	246 (63.7)	2.4 (1.0 to 5.7)
Intra-abdominal infection	17 (54.8)	259 (66.1)	0.6 (0.3 to 1.3)

## RESULTS

### Healthcare utilization outcomes

- Younger patients (age ≤ 65 years) or male patients were more likely to experience a 30-day ED visit or 30-day admission after discharging with a fluoroquinolone to a nursing home
- Patients with renal diseases were more likely to experience a 30-day ED visit or 30-day admission after discharging with a fluoroquinolone to a nursing home
- Patients with a diagnosis of osteomyelitis were more likely to experience a 30-day ED visit or 30-day admission after discharging with a fluoroquinolone to a nursing home
- Having a prescription for ciprofloxacin or for any fluoroquinolone >7 days was not associated with increased risk of experiencing a 30-day ED visit or 30-day admission after discharge

## CONCLUSIONS

- Among patients prescribed a fluoroquinolone on discharge, only 11.6% received an ID consult in the hospital
- 65% of patients prescribed a fluoroquinolone on discharge experienced a 30-day ED visit or 30-day admission
- Patients with underlying renal disease, an infectious diagnosis of osteomyelitis, of younger age (≤65 years), or male sex who were prescribed a fluoroquinolone on discharge were more likely to experience a 30-day ED visit or 30-day admission
- Primary limitation is that it is unknown if the 30-day ED visit or 30-day admission was caused by the fluoroquinolone prescription, an underlying condition, or another factor
- Future work will include chart review and use of multivariable statistical modeling to better understand the associations between fluoroquinolone prescribing and having a 30-day ED visit or 30-day admission

## DISCLOSURES

Nothing relevant to disclose.

## ACKNOWLEDGEMENTS

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## CONTACT INFORMATION

Tyler Lantz, PharmD Candidate Class of 2021  
 Email: lantzt@oregonstate.edu  
 Twitter: @tylerlantzt9  
 LinkedIn: in/tylerlantzt1