

Reducing Fluoroquinolone Use Through Implementation of a Urinary Tract Infection (UTI) Treatment Pathway and Healthcare Provider Education: A Pre- and Post-Intervention Study

Erica Little, PharmD^{1,2}, Nikki Land, RPh², Brian Peters, PharmD, MS², Tracey Ikerd, MD²

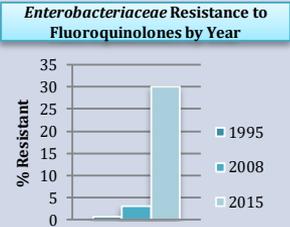
(1)ProHealth Care Waukesha Memorial Hospital, Waukesha, WI, (2)Riverview Health, Noblesville, IN

Background¹⁻³

- Fluoroquinolones (FQN) are associated with significant adverse events leading to several FDA enhanced warnings from 2008 to 2018
- Trend of increasing resistance of *Escherichia coli* and other gram-negatives
- FQNs considered inappropriate as first line for simple infections, including urinary tract infections (UTI).

Adverse Effects of Fluoroquinolones

- Tendinitis/tendon rupture
- Hypoglycemia/severe blood sugar disturbances
- Classified as high-risk for causing *C. difficile* infection
- Mental health disturbances
- Peripheral neuropathy



Methods

Study Objective

- Decrease inappropriate use of FQN for treatment of UTI in admitted patients and outpatients through implementation of a UTI treatment pathway and targeted provider education

Study Design

- Pre- and post-intervention study in a community hospital and associated clinics
- Statistical analysis via SAS software; alpha set to 0.05

Retrospective chart review: electronic medical record query for patients with UTI diagnosis prescribed a FQN from 1/2016 to 11/2016

Implementation: UTI treatment pathway with focus on FQN avoidance sent to providers, published in newsletter, posted throughout institution

Post-Intervention chart review: comparison to prior data and assessment of compliance with pathway (11/2016 to 3/2017)

Primary Outcomes: Appropriateness of FQN use to treat UTI inpatient, outpatient, and overall
 Appropriateness evaluated based on factors including urine culture results (when available), age, comorbidities, past medical history, allergies, current guidelines, and local antibiogram data

Secondary Outcomes:

- Percentage of patients prescribed FQN
- Appropriateness of duration of therapy

Inclusion Criteria	Exclusion Criteria
<ul style="list-style-type: none"> Age ≥18 years Seen on inpatient units or in outpatient clinics Diagnosis of UTI treated with antibiotic 	<ul style="list-style-type: none"> Pregnant or breastfeeding Chronic/recurrent UTI Severe immunosuppression Paraplegia/Tetraplegia Diagnosis of pyelonephritis

Results

Baseline Characteristics

- A total of 212 patients were included, 159 in the pre-intervention group and 53 in the post-intervention group
 - 83% female
 - Mean age, years (±SD): 68.4 (17.7)
- Patients in the pre- and post-intervention group were well-matched for baseline characteristics with no significant differences (P>0.05)

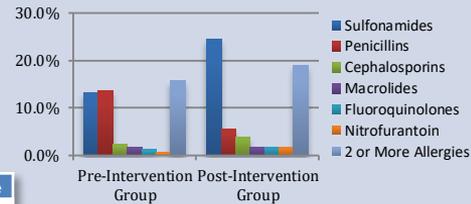
Appropriateness of FQN Use to Treat UTI

Primary Outcome	Pre-Intervention	Post-Intervention	P-Value
Appropriateness of Use: Inpatient + Outpatient (Overall)	19.0%	47.2%	<0.001
Appropriateness of Use: Inpatient Only	24.1%	57.1%	0.007
Appropriateness of Use: Outpatient Only	16.0%	40.6%	0.005

Appropriateness of Duration/Percentage of Patients who Received FQN for UTI

Secondary Outcomes	Pre-Intervention	Post-Intervention	P-Value
Appropriate Duration of Therapy: Inpatient + Outpatient (Overall)	49.0%	53.3%	0.305
Treatment of UTI with a Fluoroquinolone	31.6%	22.4%	0.037

Percentage of Patients with Antibiotic Allergies



Additional Findings

- Purchasing data showed a decrease in inpatient ordering of fluoroquinolones during post-intervention phase

	November	December	January	February
2015-2016	\$475.17	\$664.31	\$179.64	\$529.03
2016-2017	\$62.33	\$333.85	\$159.52	\$151.82

Conclusions

- Provider education, along with the implementation of a clinical pathway for UTI treatment, significantly reduced the inappropriate use of fluoroquinolones in the treatment of UTI in both the inpatient and outpatient settings.
- The intervention led to a significantly decreased percentage of fluoroquinolones used for the treatment of UTI and increased percentage of other pathway-recommended antibiotics.
- Use of antibiotic regimens with inappropriate durations of therapy for treatment of UTI was not significantly altered by the intervention.
- Organizational purchasing data showed that overall inpatient ordering cost for fluoroquinolones was decreased during the post-intervention phase compared with ordering costs for the previous year during the same time period.

References

- Lexicomp. Wolters Kluwer Health, Inc. Hudson, OH. Available at: <http://online.lexi.com>. Accessed August 2018.
- Tandan M, Cormican M, Vellinga A. Adverse events of fluoroquinolones vs. other antimicrobials prescribed in primary care: a systematic review and meta-analysis of randomized controlled trials. *J Antimicrob Ag*. 2018;4(14):1-26.
- Spellberg B, Yohei D, et al. The rise of fluoroquinolone-resistant *Escherichia coli* in the community: scarier than we thought. *J Infect Dis*. 2015;212:1853-5.

Disclosures

Authors have no actual or potential conflicts of interest to disclose in regards to this poster presentation. The views expressed in this poster are those of the authors.