

Evaluation of a pilot initiative for tracking and monitoring indications associated with antibiotic orders

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Background

- In December 2017, the Christiana Care Antimicrobial Stewardship Program, with the support of Medication Safety and the Pharmacy and Therapeutics Committee, developed a pilot initiative for tracking and monitoring antibiotic utilization across the health system to be in accordance with Joint Commission, CMS and IDSA recommendations for ASP.^{1,2,3}
- Antimicrobial agents monitored in this pilot include cefepime, ceftriaxone, levofloxacin, and ciprofloxacin. A customized indication list was created for each antibiotic.
- The goal of this initiative is to allow for enhanced transparency between all providers, provide greater understanding of antibiotic utilization, and ultimately aid in identifying opportunities for improvements across the healthcare system.

Purpose

- To assess accuracy of selected indications for antimicrobial agents cefepime, ceftriaxone, levofloxacin, and ciprofloxacin

Methods

Study design: Retrospective chart review

- A maximum of 50 orders per each antibiotic out of a sample size of 540 orders from December 31, 2017-January 6, 2018 were randomly selected to be evaluated for the following endpoints:

Primary endpoint:

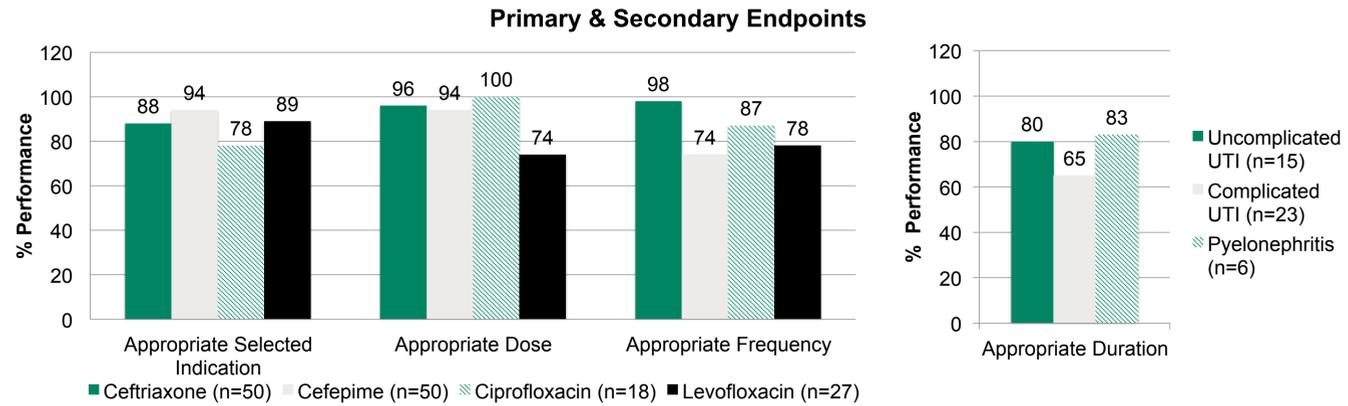
- Percent (%) of cases in which indication was selected according to true indication documented in progress note

Secondary outcomes:

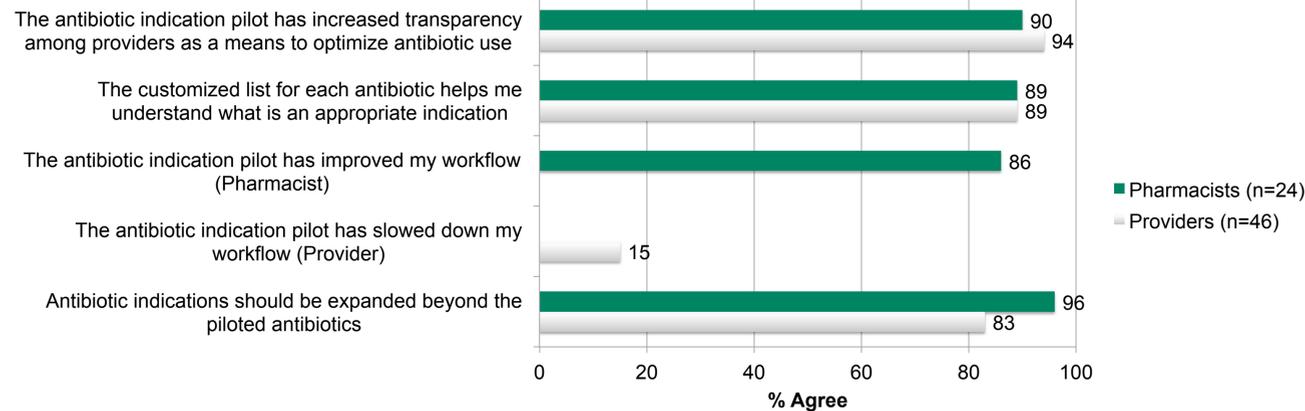
- Percent (%) of cases in which appropriate dose was prescribed according to selected indication
- Percent (%) of cases in which appropriate frequency was prescribed according to Christiana Care renal dosing guidelines
- Percent (%) of urinary tract infection (UTI) cases in which duration of therapy was appropriate for uncomplicated UTI, complicated UTI, and pyelonephritis

A subsequent retrospective chart review was conducted from March 1, 2018-May 31, 2018 to further evaluate "other-specify indication" orders. A follow-up survey was also distributed at this time.

Results



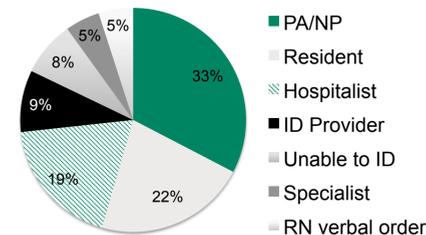
Provider/Pharmacist Survey



Orders entered as "other-specify indication" WITH comments

Drug	%	Comments
Ceftriaxone	97% (159/164)	STD: 9% (10/159) Intra-abdominal infection: 31% (50/159) • SBP/SBP prophylaxis: 54% (27/50)
Ciprofloxacin	93% (107/115)	Intra-abdominal infection: 50% (56/107)
Levofloxacin	87% (111/128)	No specific trends observed
Cefepime	93% (115/123)	No specific trends observed

Who did NOT enter an indication?



Discussion

- It appears that the available indications are able to reliably capture the majority of indications for the piloted antibiotics.
- Greater awareness of inappropriate dosing strategies has created impetus to update our institutional renal dosing guidelines to better coincide with available indications. Inappropriateness of frequency primarily occurred as a result of overestimation of renal function. This highlights an area for pharmacist intervention and warrants the availability of creatinine clearance for providers at the time of order entry.
- The indication of "β-lactam allergy" was selected among ciprofloxacin and levofloxacin orders when a penicillin allergy was not reported, which highlights the importance of verifying patient allergies to minimize adverse effects associated with fluoroquinolone use.
- Our subsequent review of "other-specify indication" orders has led to consideration of an indication for spontaneous bacterial peritonitis (SBP) and sexually transmitted disease (STD) for ceftriaxone orders. Additionally, the "Christiana Care Way Colitis Project" was created to identify opportunities for improvement in the management of colitis, considering suboptimal *E. coli* susceptibilities and the increased risk of *Clostridium difficile* infections associated with fluoroquinolones.
- Overall feedback regarding the pilot initiative was positive. Ultimately, we hope to expand this initiative to additional antibiotics and further evaluate dosing strategies, treatment durations, and indications.

Conclusion

- The pilot initiative for tracking and monitoring of antibiotic utilization has allowed for enhanced transparency between providers regarding antimicrobial use and has identified several areas for improvement.

1. "Approved: New Antimicrobial Stewardship Standard." *Jointcommission.org*, July 2016, www.jointcommission.org/new_antimicrobial_stewardship_standard/.
2. Centers for Disease Control and Prevention. Core Elements of Hospital Antibiotic Stewardship Programs. <http://www.cdc.gov/getsmart/healthcare/implementation/core-elements.html>.
3. Barlam TF, Cosgrove SE, Abbo LM, et al. Executive Summary: Implementing an Antibiotic Stewardship Program: Guidelines by the Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America. *Clin Infect Dis*. 2016;62(10):1197-202.

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