

Accuracy of Antibiotic Prescriptions for Urinary Tract Infection in Pediatric Ambulatory Care

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Introduction

Antimicrobial stewardship programs have typically focused on inpatient care, but antibiotics are frequently prescribed at pediatric ambulatory care centers.¹ In addition to appropriate antibiotic selection, ensuring accurate pediatric antibiotic dosing is important to optimize outcomes while minimizing adverse drug effects.² Pharmacists filling pediatric antibiotic prescriptions in the outpatient setting often lack the resources, including patient diagnosis and weight, and pediatric drug references, to recommend optimal dosing for pediatric infections. The purpose of this review was to evaluate the accuracy of dose, frequency, and formulation of outpatient antibiotic prescriptions for pediatric urinary tract infections (UTI), and to describe the most common antibiotic treatment durations.

Methods

A retrospective review of electronic medical records was conducted at two suburban pediatric practices.

- Patients were identified using ICD-10 codes N39, R30 and R35 between January 1, 2018 and December 31, 2019.
- Patients ages 2 months-18 years were included if they were prescribed an oral antibiotic for the treatment of UTI.
- Data collected included baseline demographics as well as complete prescription data; antibiotic, dose (mg and mg/kg), frequency, formulation, and duration.

Methods

- Primary objective: to evaluate the accuracy of antibiotic dose, frequency and formulation prescribed
- Secondary objective: to describe the most commonly prescribed treatment durations
- Antibiotic dose, frequency and formulation considered accurate if consistent with clinical guidelines and tertiary dosing references, allowing for 10% rounding in weight-based doses^{3, 4}
- When dosing recommendations specific to UTI were not available for an antibiotic, dose was evaluated using general pediatric dosing recommendations

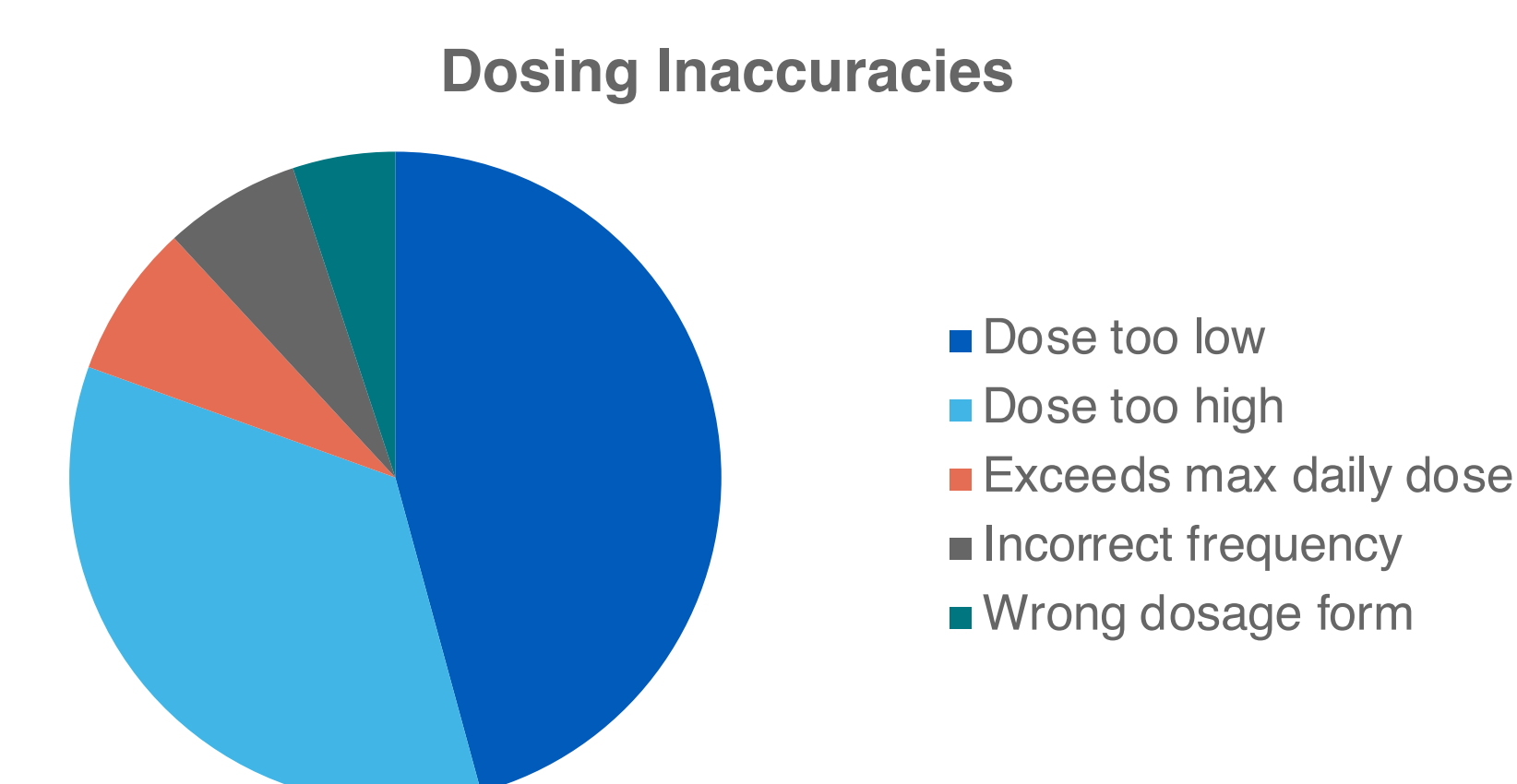
Results

- 472 outpatient prescriptions met inclusion criteria
- Cefprozil (35%) was the most commonly prescribed antibiotic for pediatric UTI, followed by SMX-TMP (27%) and Amoxicillin (13%)

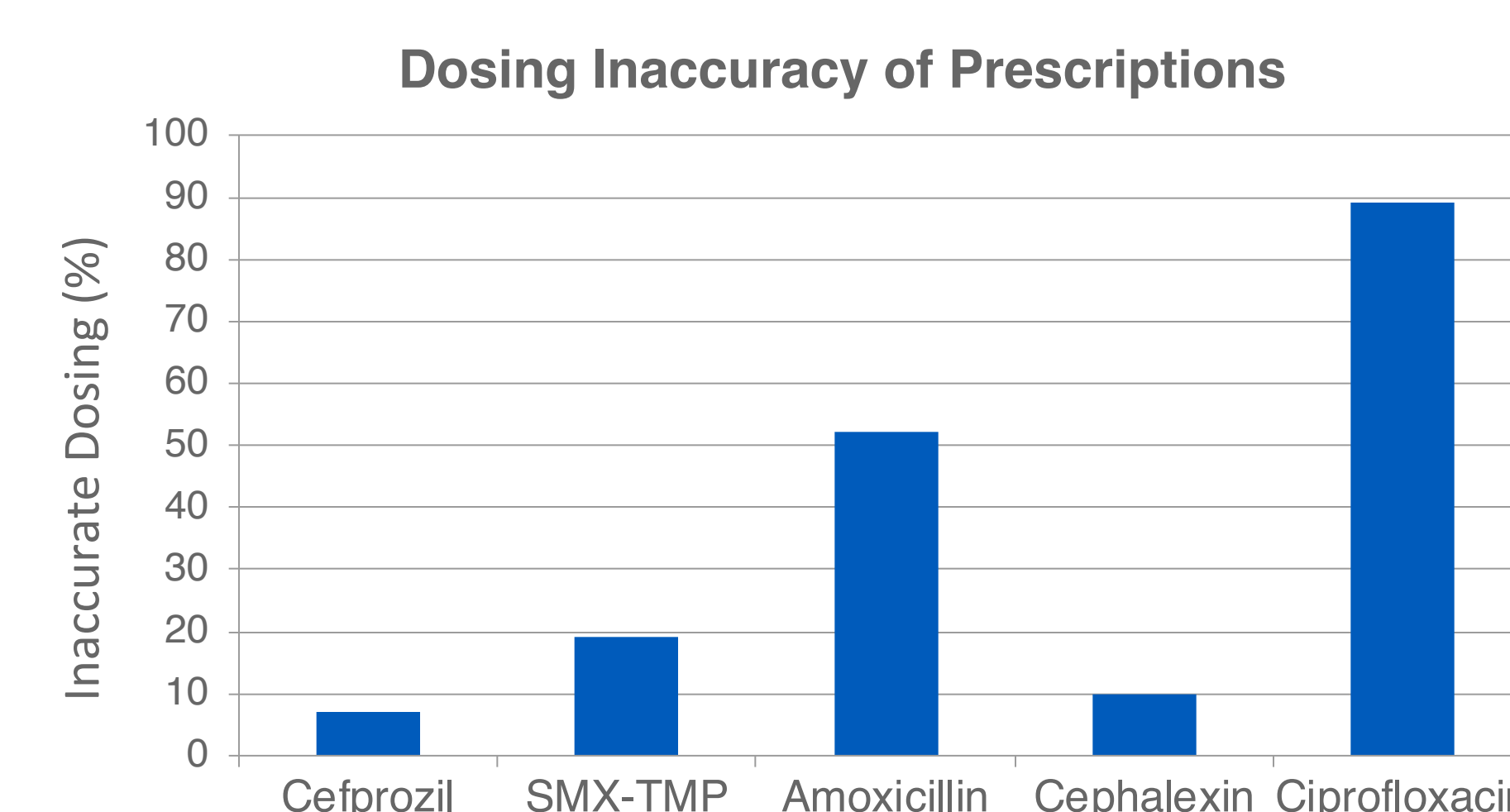
Antimicrobial	Number of Prescriptions	Proportion of Prescriptions (%)
Cefprozil	165	35
SMX-TMP	126	27
Amoxicillin	64	13
Cephalexin	40	9
Cefdinir	28	6
Ciprofloxacin	27	5
Amox-Clav	13	3
Nitrofurantoin	5	1
Cefixime	3	<1
Clindamycin	1	<1

- 24% (n=115) of dosing regimens were found to be inaccurate for pediatric UTI

Results

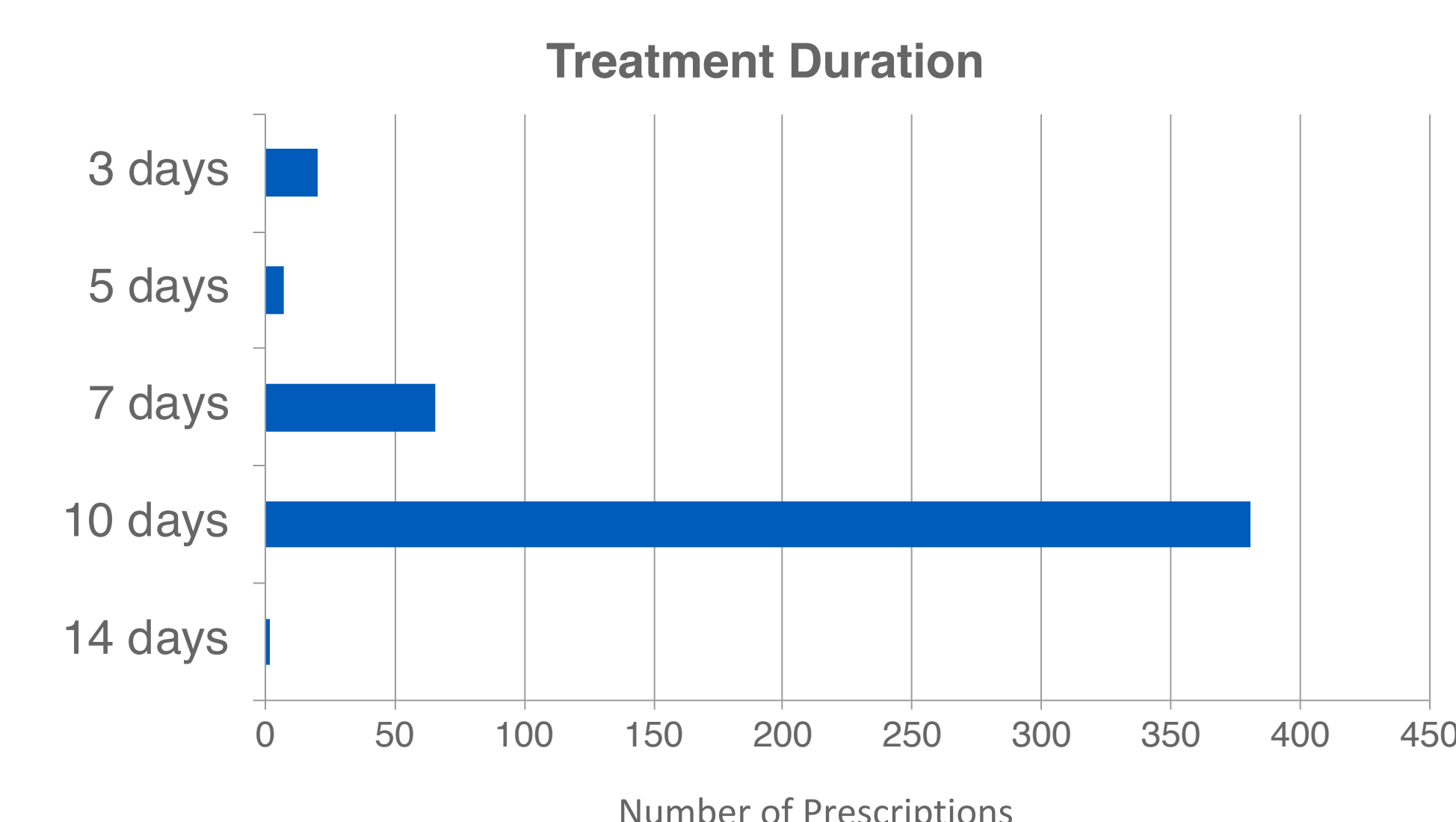


- Patients were most commonly prescribed doses that were too low (54/118, 45%) or too high (41/118, 35%)
- Of the commonly prescribed antibiotics, dosing errors were most likely to occur with ciprofloxacin (24/27, 89%) and amoxicillin (33/64; 52%)



Common themes resulting in dosing inaccuracies included:

- Amoxicillin: Using "high dose" (90 mg/kg/day) regimens not required for pathogens common to pediatric UTI
- Ciprofloxacin: Capping doses at 500 mg/dose; recommended max dose for UTI is 750 mg
- SMX-TMP: Doses prescribed lower than recommended range for pediatric UTI



The majority of patients (80%) completed a 10-day course of antibiotics.

Conclusions

- Errors in antibiotic dosing occurred with nearly one in four prescriptions written for outpatient urinary tract infections from pediatric primary care centers.
- Antibiotic treatment duration for pediatric UTI in the outpatient setting was most commonly 10 days, which is likely longer than is necessary for a typical uncomplicated outpatient UTI.⁵
- Education and resources should be provided to outpatient pediatric providers to optimize antibiotic dosing.

References

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