

Narrow-Spectrum, Short-Course Antibiotic Therapy

for Bacterial Cystitis in the Urgent Care

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Background

Urinary tract infection (UTI) accounts for substantial antibiotic exposure in children.

In the Nationwide Children's Hospital (NCH) off-site urgent care (UC) network, frequent use of broad-spectrum antibiotics for UTI for long treatment durations (7-10 days).

Many of these children have uncomplicated bacterial cystitis for which a short course (3-5 days) of a narrow-spectrum antibiotic is likely adequate.

The objective of this quality improvement initiative was to increase the use of narrow-spectrum, short-course antibiotic therapy for UC patients with UTIs.

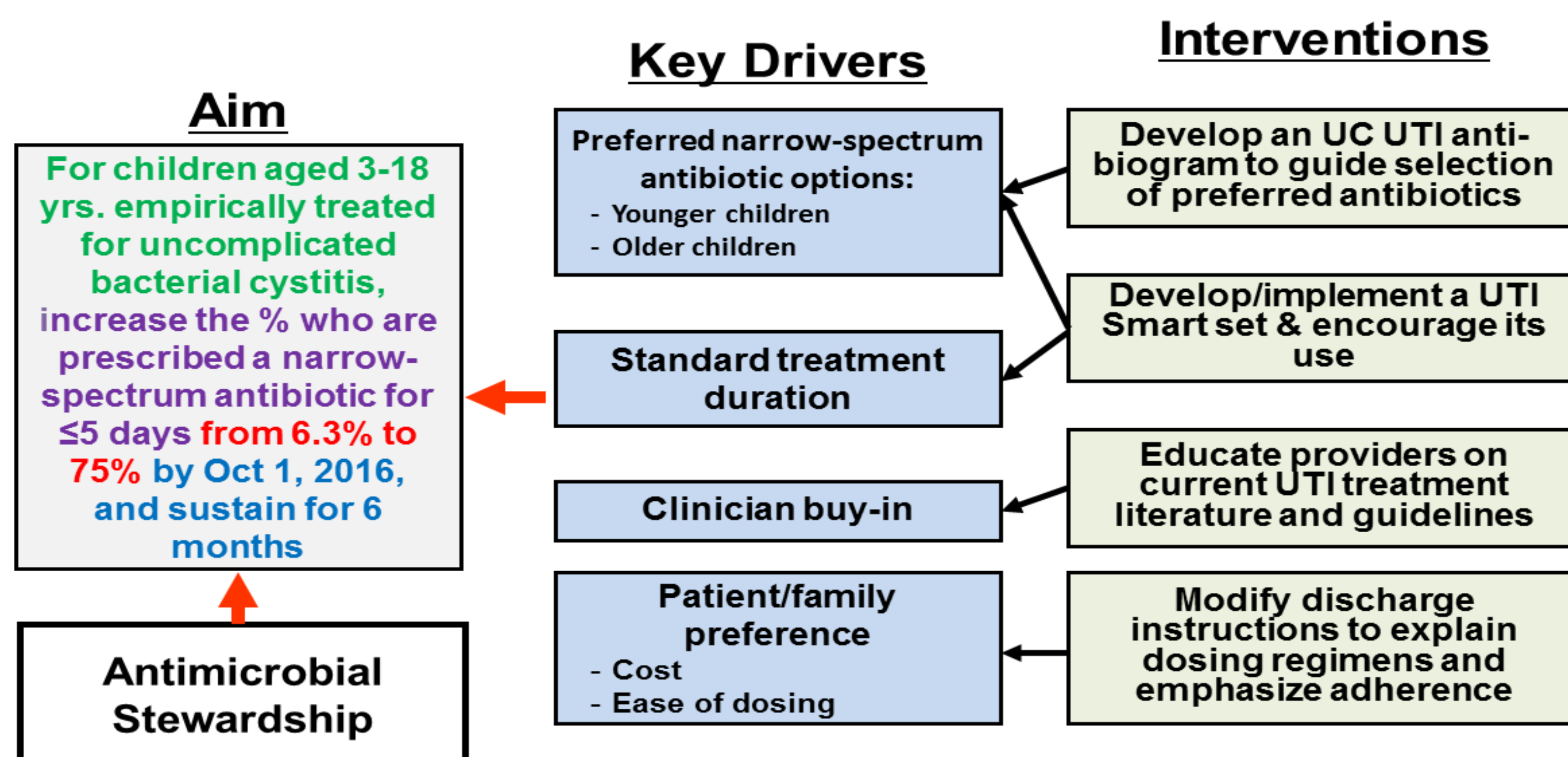
Methods

Created a multidisciplinary quality improvement team with representatives from urgent care, infectious diseases, laboratory medicine, quality improvement services, pharmacy, and nursing

Included: Children 3-18 years of age who were evaluated in an off-campus NCH UC and treated empirically for bacterial cystitis

Excluded: Documented fever (≥ 100.4 °F), suspected pyelonephritis, or other infections that may be treated with antibiotics overlapping with UTI

Figure 1. Key Driver Diagram



Methods cont.

Narrow-spectrum antibiotics: amoxicillin, cephalexin, nitrofurantoin, trimethoprim/sulfamethoxazole (TMP/SMX)

Broad-spectrum antibiotics: cefdinir, ciprofloxacin

Process measure: utilization of the discharge Smart Set

Balancing measure: repeat positive urine culture (same pathogen as initial culture) within 14 days of antibiotic completion

Figure 2. Susceptibility of 576 *E. coli* isolates $\geq 10,000$ CFU/mL from UC patients in 2015

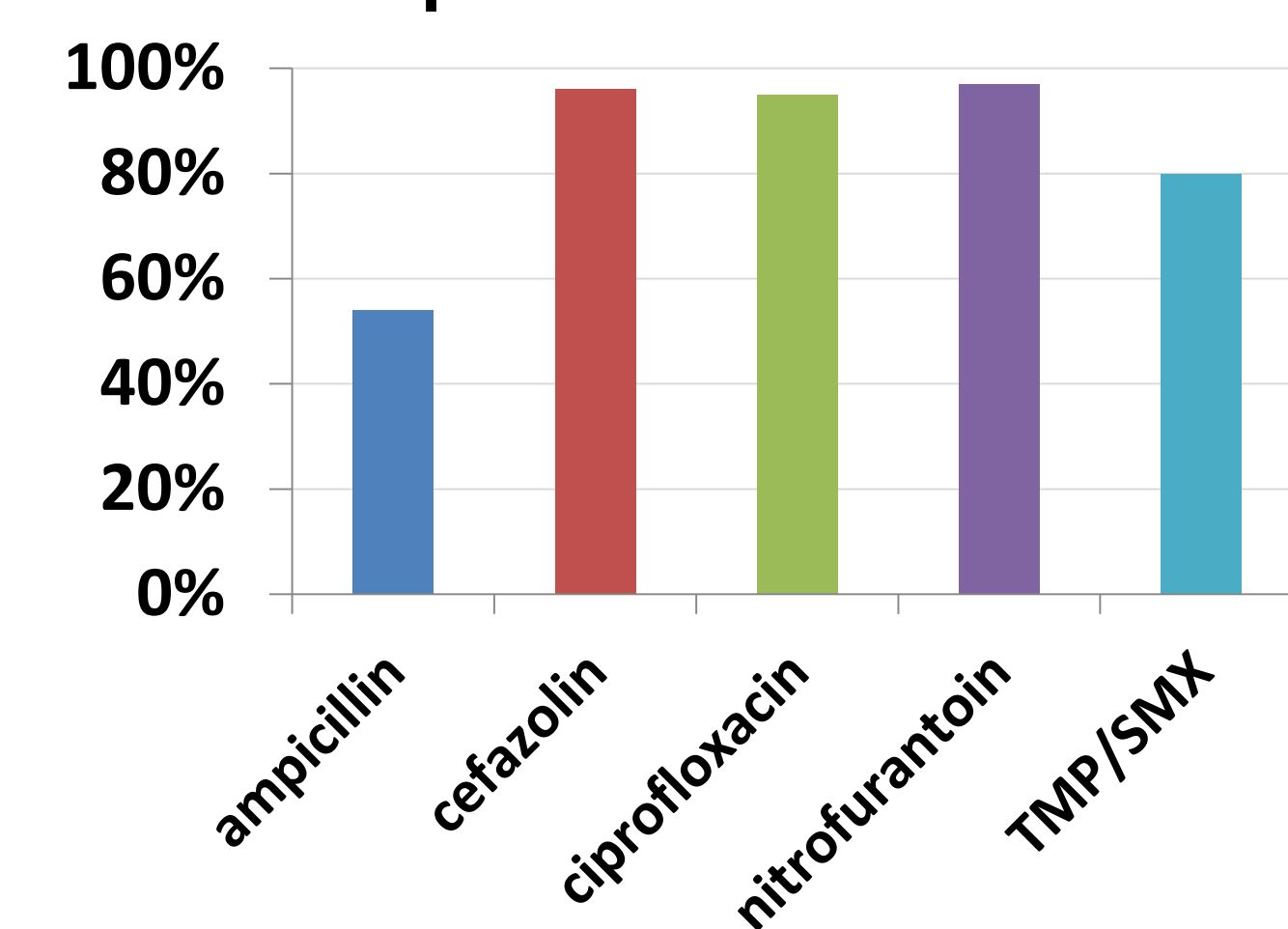


Table 1. Smart Set recommendations for treatment of bacterial cystitis

Age group	Antibiotic	Dose
3-11y	Preferred	cephalexin 25 mg/kg TID
	2 nd -line	cefdinir 14 mg/kg QD
$\geq 12y$	Preferred	nitrofurantoin 100 mg BID
	2 nd -line	cephalexin 500 mg BID

Recommended duration: 5 days

Results

Figure 3. Control chart of prescriptions for narrow-spectrum antibiotics for ≤ 5 days for treatment of uncomplicated bacterial cystitis (n = 1437 encounters)

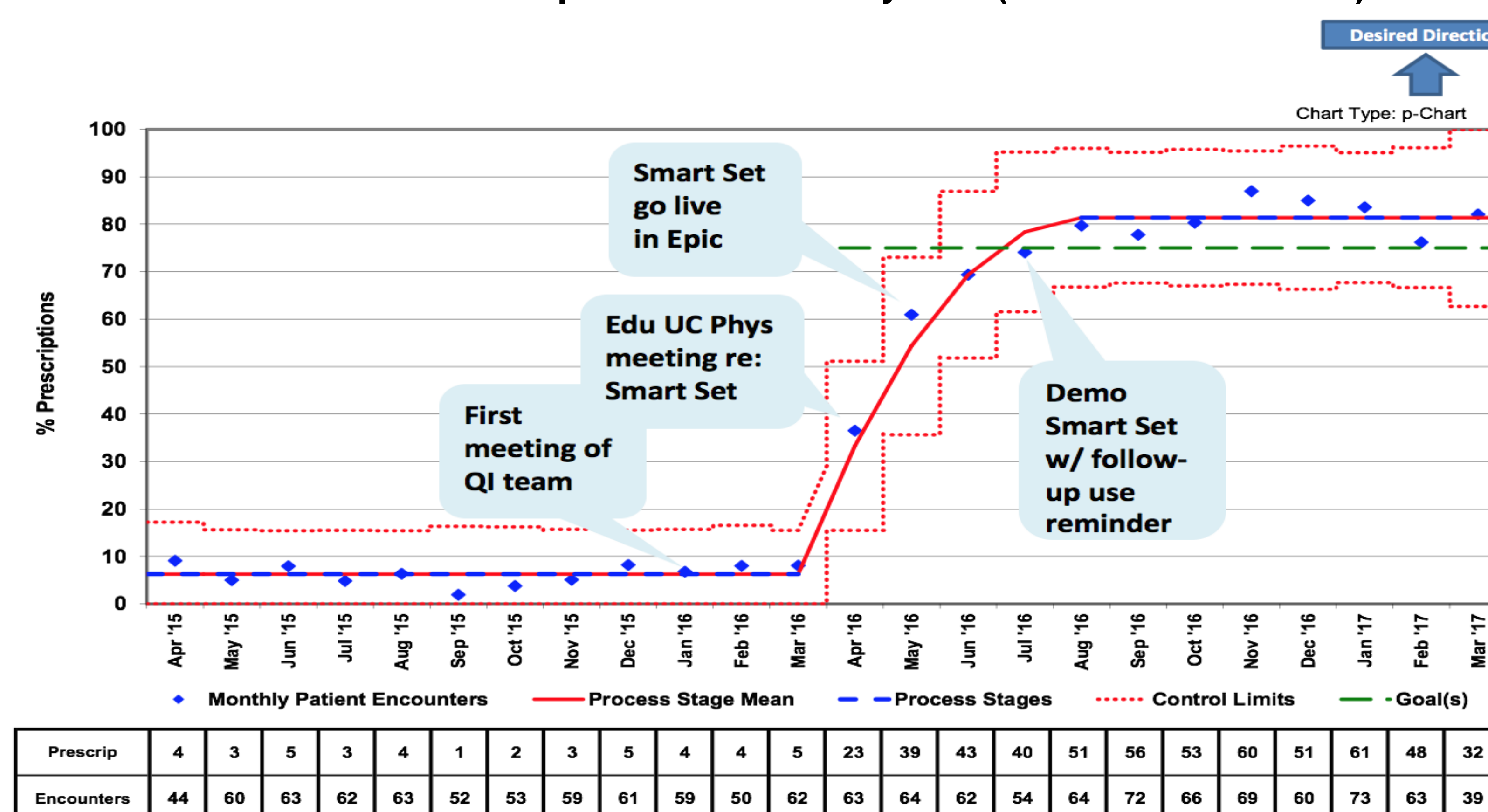


Figure 4. Relative frequencies of antibiotics prescribed

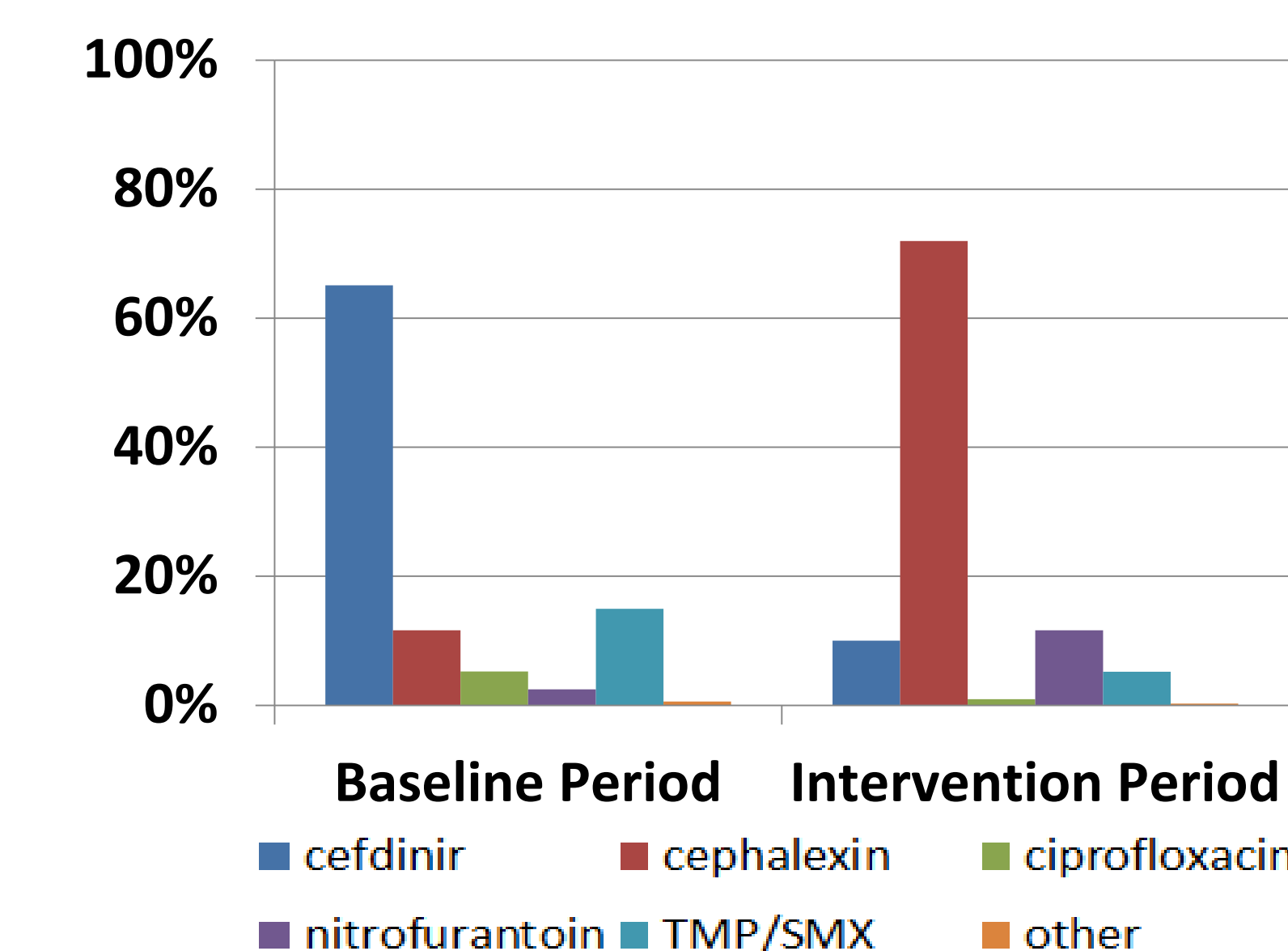
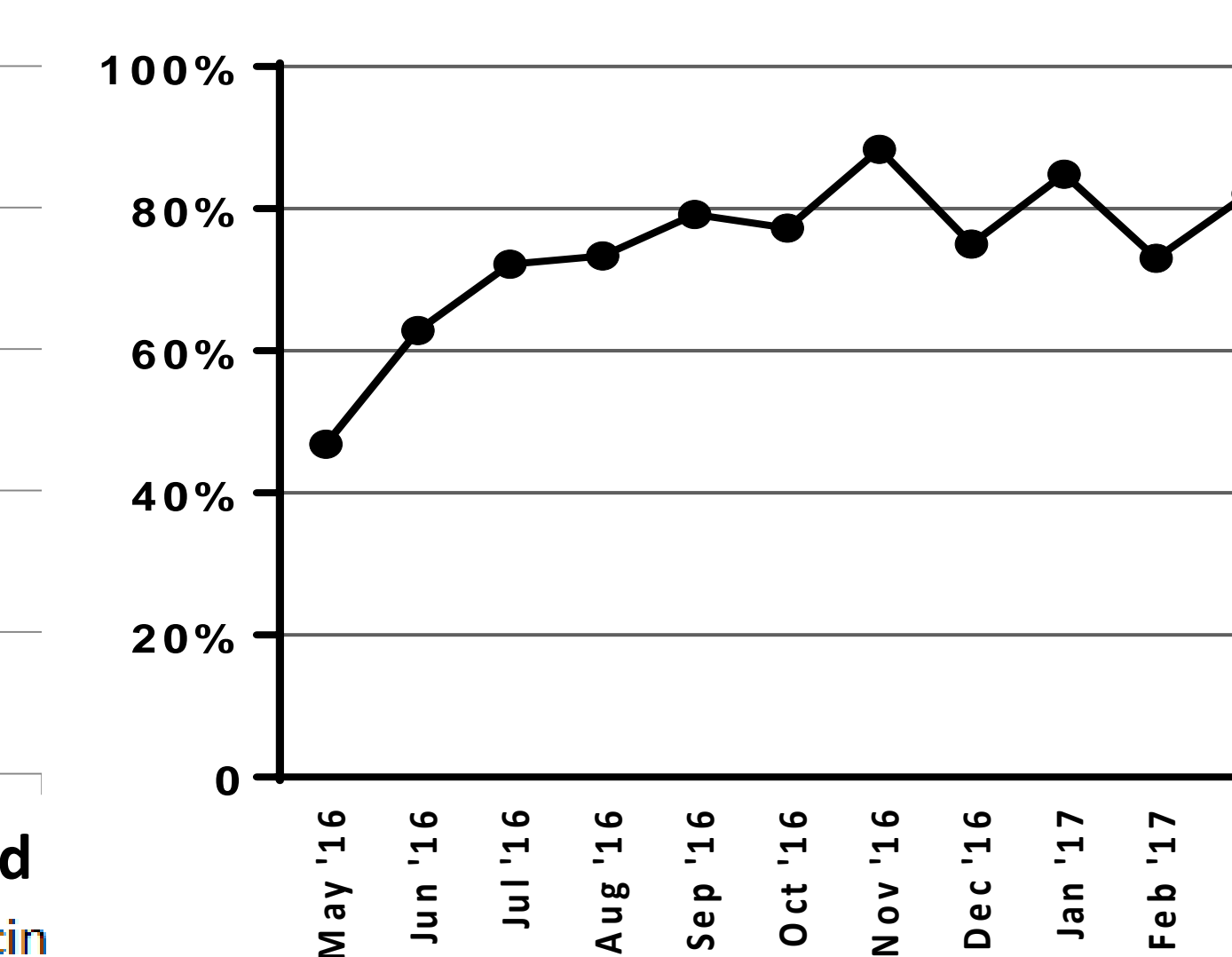


Figure 5. Percent of antibiotics prescribed via the Smart Set



Balancing Measure

Table 2. Repeat positive urine cultures within 14 days of antibiotic completion

	Treatment Group		P Value
	Narrow-spectrum, short-course	Not narrow-spectrum, short-course	
Encounters, n	600	837	
Repeat positive cultures, n (%)	7 (1.2)	6 (0.7)	0.41

Discussion

Empiric management of UTI is an essential opportunity for improved antimicrobial stewardship in the urgent care.

In this quality improvement initiative over a 24-month period, the percentage of patients prescribed narrow-spectrum antibiotics for ≤ 5 days increased from 6.3% to 81%.

Clinician education and implementation of a discharge order set (Smart Set) effectively reduced broad-spectrum antibiotic exposure by providing a "nudge" toward narrow-spectrum, short-course treatment.

No significant increase in UTI relapse was found in patients treated with a short course of narrow-spectrum antibiotics.