

Impact of infectious diseases pharmacists on adherence to guideline recommendations for antibiotics prescribed at discharge from the inpatient setting

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Background

- Inappropriate antibiotic prescribing is common and contributes to increased incidence of antibiotic adverse effects including *C. difficile* infections
- >65% of patients with community-acquired pneumonia (CAP) receive excessively long durations of antibiotics¹
- Pharmacist intervention has been shown to reduce antibiotic duration for pneumonia (9 vs 6 days)² and thus improve adherence to guidelines
- In 2018, UnityPoint Health – Meriter pharmacists created disease-specific prescribing algorithms for provider use in the emergency department and provided prospective review and feedback to physicians with a resultant improvement in guideline adherence (11.7% to 61.5%, P<0.001).

1. Vaughn VM, et al. Ann Intern Med 2019 Aug 6;171(3):153-163; 2. Foolad F, et al. J Antimicrob Chemother 2018 May 1;73(5):1402-1407.

Purpose

- Assess the impact of ID pharmacist review of antibiotics prescribed at discharge from the inpatient setting for CAP, skin and soft tissue infections (SSTI), and urinary tract infections (UTI).

Methods

- Case controlled trial of a quality improvement measure
- Study population:** Patients with CAP, UTI, or SSTI who receive antibiotics from our outpatient pharmacy at discharge from the inpatient setting
- Excluded:** Patients with conditions requiring prolonged antibiotic courses, immunosuppressive medications/conditions, pregnancy, or with an ID physician consultation
- Intervention:** ID pharmacist was alerted to patients with antibiotics by inpatient and discharge pharmacists. The ID pharmacist reviewed appropriateness and prospectively intervened based on pharmacist-created, guideline-based prescribing algorithms.

Control group: Patients pre-intervention

Study group: The same patients post-intervention

- Study period:** 12/18/19-2/28/20
- Primary outcome:** Composite of appropriateness regarding antibiotic dose, duration, and spectrum
- Secondary outcomes:** 1) Individual components of the primary outcome; 2) Mean total duration of antibiotic therapy per disease state

Patient Characteristics

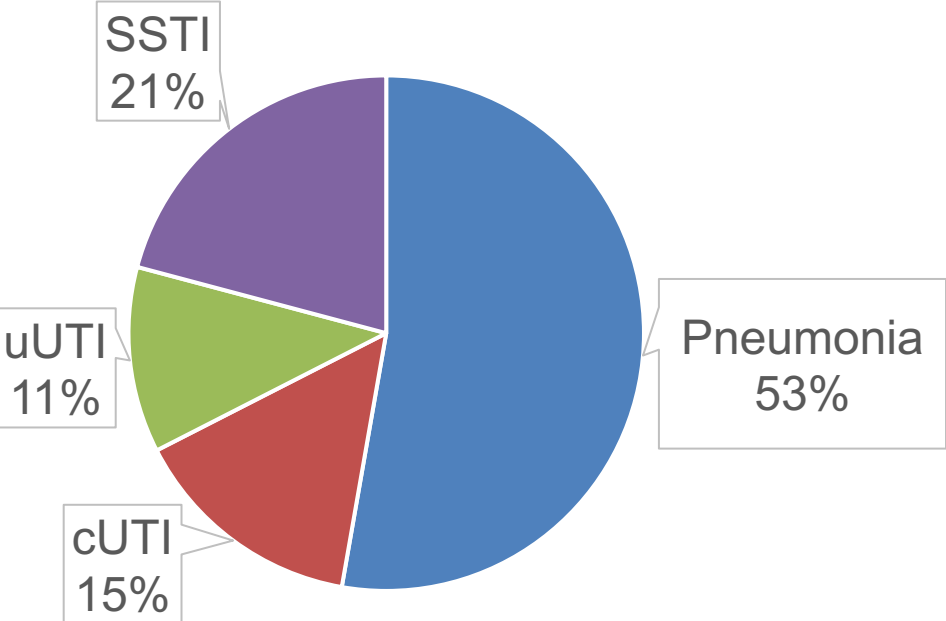
Characteristic	Study Population (n=77)
Mean Age	57 years
Mean Weight	87 kg
Mean Renal Function (CrCl)	91 mL/min
Gender	43 Female (56%) 34 Male (44%)

Results

Assessment of Need (Jan-Mar 2019)

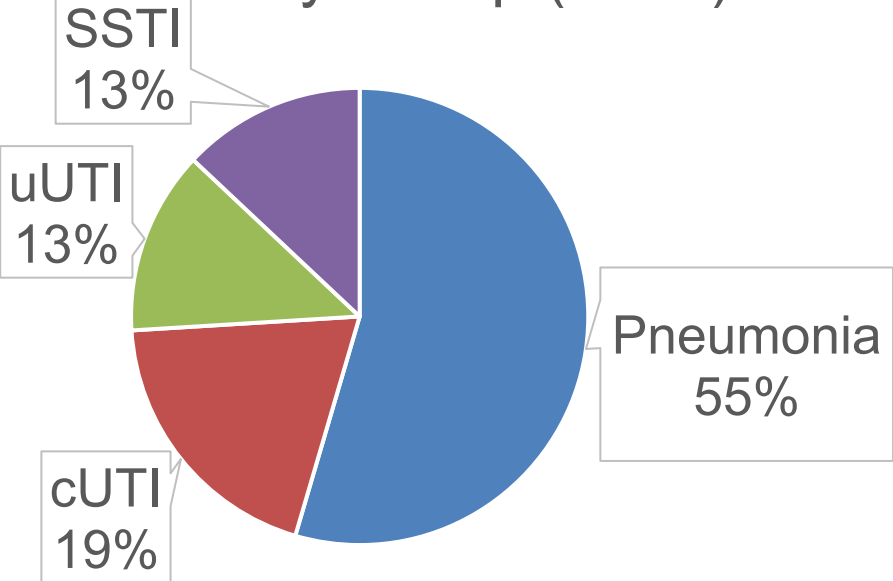
Historical Review Group (n=163)	
Appropriate	21.5%
Inappropriate	76.5%

Historical Review Group (n=163)

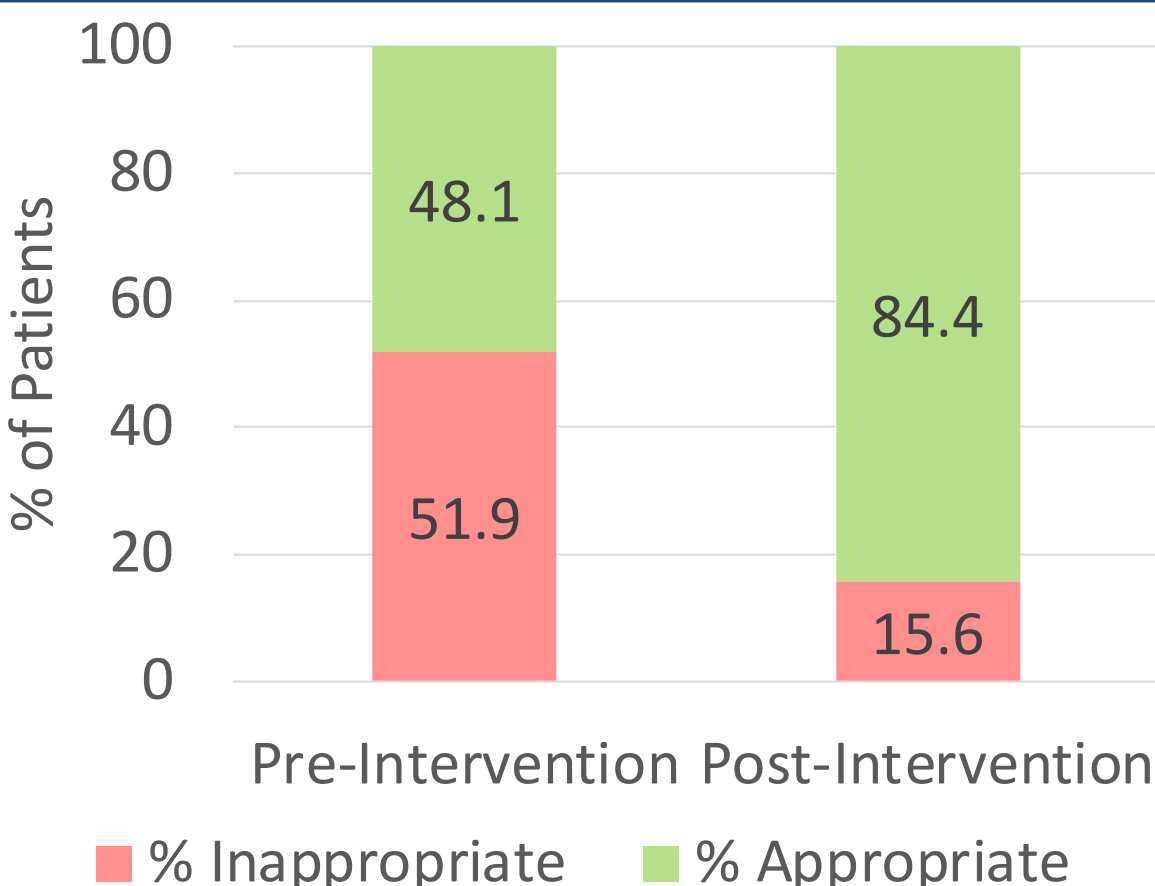


Patients per Disease State

Study Group (n=77)



Primary Outcome: Appropriateness of Dose, Duration, and Spectrum



•75.5% increase in over all appropriateness

•Absolute increase: ~ 36%

•P<0.05

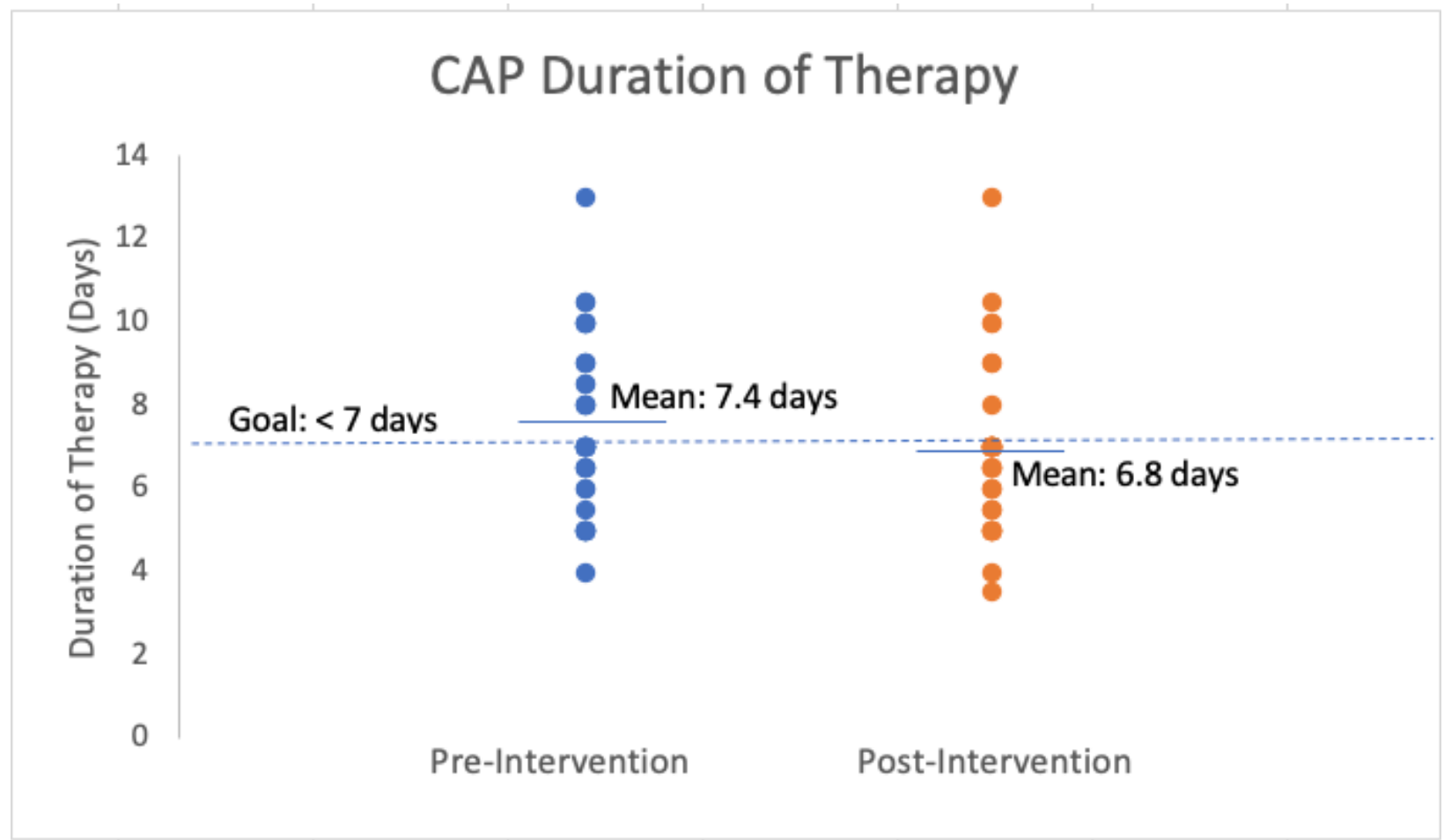
Results

Secondary Outcome: Individual Components of the Primary Outcome

	Pre-Intervention (n=77)	Post-Intervention (n=77)	Absolute Difference
Duration	46 (59%)	66 (85%)	26% (P<0.05)
Drug	70 (91%)	77 (100%)	9% (P<0.05)
Dose	71 (92%)	75 (97%)	5% (P>0.05)

Secondary Outcome: Mean Total Duration per Disease State

Disease State	Goal Duration (days)	Mean Days of Therapy Pre-Intervention	Mean Days of Therapy Post-Intervention	Absolute Difference (days)
CAP	≤ 7	7.4	6.8	0.6 (P<0.05)
uUTI	≤ 7	6.9	5.4	1.5 (P>0.05)
cUTI	≤ 14	11.7	11.6	0.1 (P>0.05)
SSTI	≤ 7	7.8	7.5	0.3 (P>0.05)



Conclusions

- ID pharmacist intervention on antibiotics prescribed at discharge increased appropriateness of antibiotic prescribing by 75.5% (~36% absolute increase)
- Excessive duration of therapy contributed most to inappropriate prescribing.
- Pharmacist involvement increased appropriateness of duration by 26% and medication choice by approximately 9%.
- Pharmacist review of antibiotics prescribed at discharge was shown to be an effective antimicrobial stewardship method.

Limitations

- Single center study
- Prescribing habits may improve over time
- Limited hours of availability for ID pharmacist