Impact of pharmacist-led selective audit-and-feedback on outpatient antibiotic prescribing for UTIs and SSTIs

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Background

- Antibiotic misuse and overuse contributes to increased antibiotic resistance, serious adverse effects, and *C. difficile* infections

- Estimated 30% of all outpatient antibiotic prescriptions in the United States are unnecessary[1]

- Most common indications for outpatient antibiotic prescriptions are: acute upper respiratory tract infections, urinary tract infections (UTI) and skin and soft tissue infections (SSTI)[2]

- The Joint Commission implemented core elements for outpatient antimicrobial stewardship programs (ASP) in ambulatory care healthcare settings effective January 2020[3]

- The purpose of this study was to determine whether pharmacist-led selective audit-and-feedback would improve antibiotic prescribing for UTI and SSTI at two primary care practice sites

Objectives

Primary Outcome
- Total regimen appropriateness of antibiotic prescribing before vs. after audit-and-feedback

Secondary Outcomes
- Antibiotic drug selection, dose, duration, and indication for treatment as each individual prescribing component
- Patient safety outcomes: adverse drug reactions, infection-related re-visits, treatment failure, *C. difficile* infections

Methods

Study Settings
- Internal Medicine clinic: 200 patients (100 UTI, 100 SSTI)
- Family Medicine clinic: 200 patients (100 UTI, 100 SSTI)

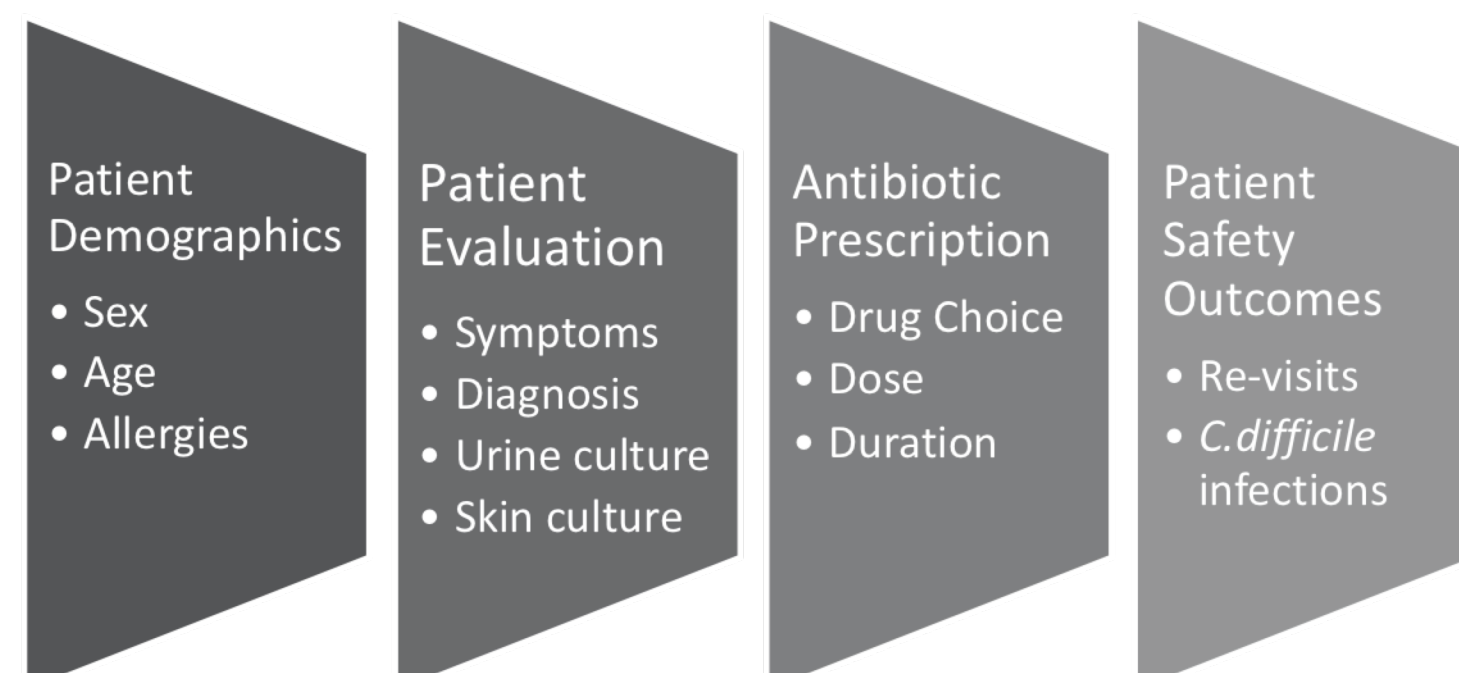**Study Design**
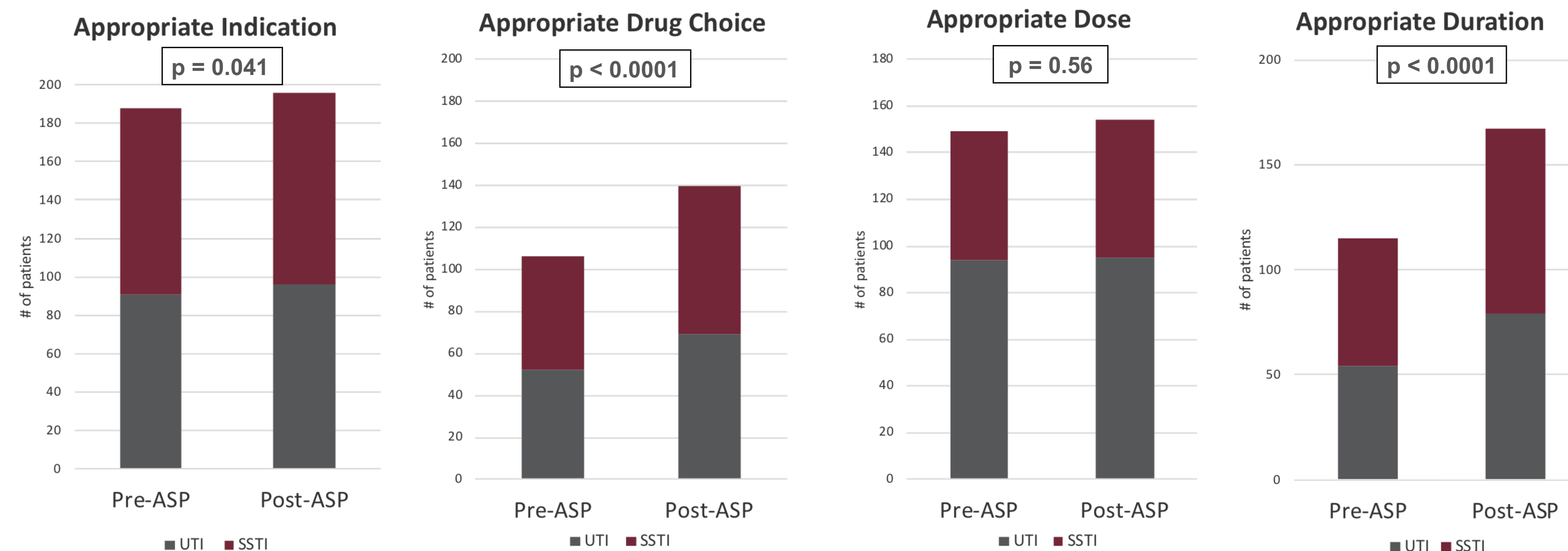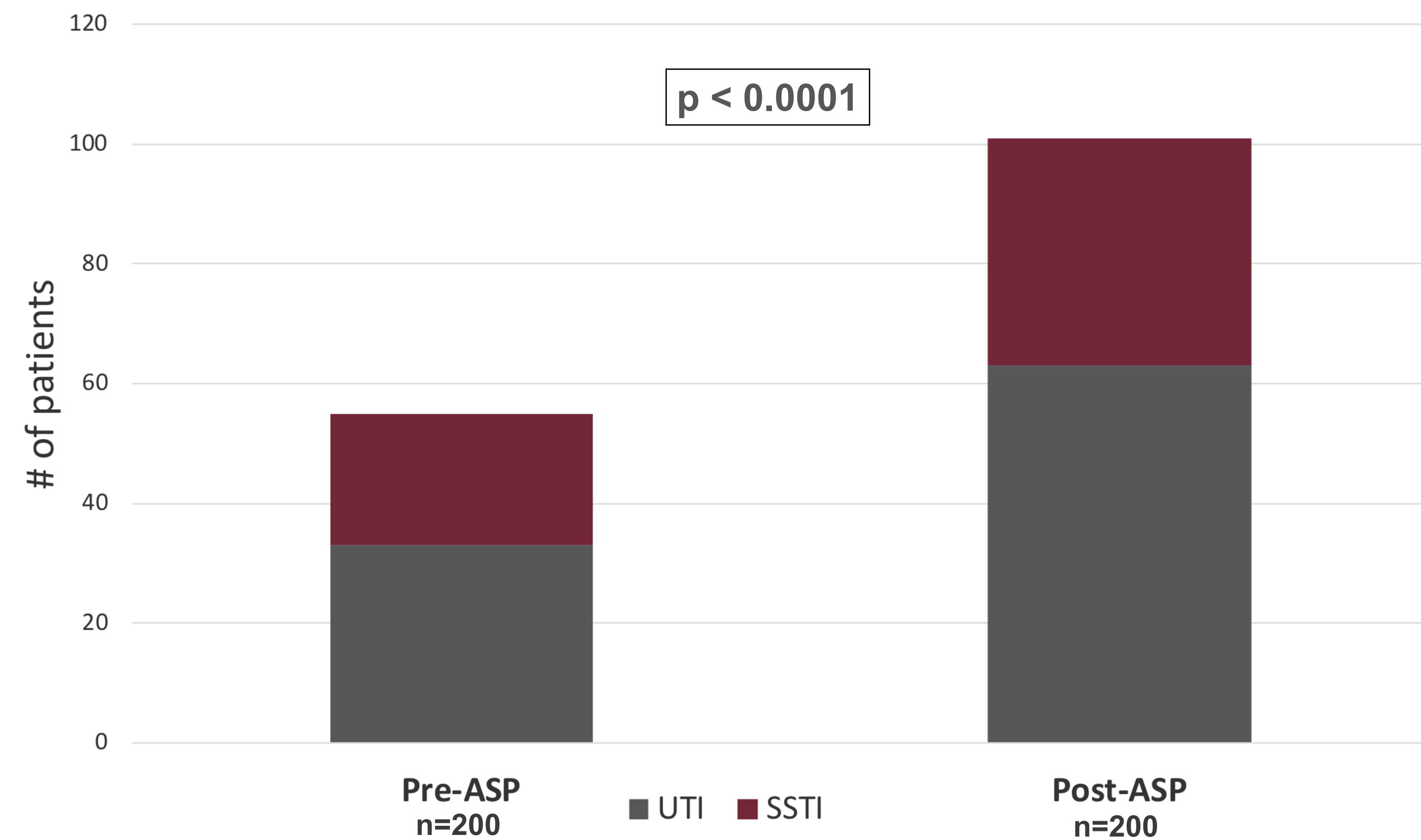- Retrospective, quasi-experimental

Inclusion Criteria
- Adults treated for uncomplicated UTI or SSTI

Data Collected

Patient Demographics
- Sex
- Age
- Allergies

Patient Evaluation
- Symptoms
- Diagnosis
- Urine culture
- Skin culture

Antibiotic Prescription
- Drug Choice
- Dose
- Duration

Patient Safety Outcomes
- Re-visits
- *C. difficile* infections

A pharmacist-led selective audit-and-feedback outpatient stewardship strategy demonstrated a significant improvement in total appropriateness in antibiotics prescribed for treatment of UTIs and SSTIs

Total Antibiotic Appropriateness

$p < 0.0001$

Pre-ASP n=200 ▪ UTI ▪ SSTI Post-ASP n=200

Appropriate Indication — $p = 0.041$

Appropriate Drug Choice — $p < 0.0001$

Appropriate Dose — $p = 0.56$

Appropriate Duration — $p < 0.0001$

Patient Demographics

Variable	Pre-ASP (n=200)	Post-ASP (n=200)	p-value
Age, years (±SD)	56 (±19)	57 (±18)	0.410
Male, n (%)	37 (18.5)	46 (23)	0.267
In-Office visit, n (%)	173 (86.5)	179 (89.5)	0.356
Midlevel provider, n (%)	61 (31)	37 (18.5)	**0.005**
No known drug allergies, n (%)	124 (62)	131 (65.5)	0.467
Beta-lactam allergy, n (%)	36 (18)	37 (18.5)	0.897
Sulfa allergy, n (%)	40 (20)	31 (15.5)	0.239
History of MRSA, n (%)	5 (2.5)	6 (3)	0.76
Charlson Comorbidity Index, median (IQR)	2 (2—4)	2 (2—4)	0.335

Patient Safety Outcomes

Variable, n (%)	Pre-ASP (n=200)	Post-ASP (n=200)	p-value
Adverse drug event	5 (2.5)	4 (2)	1.0
Treatment failure	22 (11)	18 (9)	0.505
Infection-related re-visit within 7 days	24 (12)	45 (22.5)	**< 0.005**
UTIs	8 (33)	13 (29)	0.249
SSTIs	16 (66)	32 (71)	**0.008**
Infection-related re-visit within 30 days	30 (15)	22 (11)	0.234
Infection-related hospitalization within 30 days	3 (1.5)	0 (0)	0.082
C. difficile Infection	0 (0)	0 (0)	1.0

Discussion & Conclusions

- This study demonstrates that even selective audit-and-feedback can make significant improvements in outpatient antibiotic prescribing, including antibiotic choice, duration, and whether therapy is indicated

- No significant differences in patient safety outcomes, with the exception of infection-related re-visits within 7 days which was driven by providers requesting patients to return for re-evaluation of SSTIs

- Ambulatory care pharmacists are well-suited to be outpatient stewardship leaders given their clinical expertise, training in medication management, and relationship with clinic providers

- Future direction of this study include: applying selective audit-and-feedback at specialty practice sites, and investigating the effect of automated audit-and-feedback on antibiotic prescribing

References

1. Fleming-Dutra KE, Hersh AL, Shapiro DJ, et al. *JAMA* 2016;315:1864–73.
2. Shapiro DJ, Hicks LA, Pavia AT, Hersh AL. *J Antimicrob Chemother* 2014;69:234–40.
3. R3 Report Issue 23: Antimicrobial Stewardship in Ambulatory Health Care. The Joint Commission.