



The Urgent Need for Urgent Care Antimicrobial Stewardship: Evaluating Prescribing and Patient Outcomes Associated with a Pharmacist-led Stewardship Program

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Background

- There is a paucity of literature examining antimicrobial stewardship program (ASP) interventions in ambulatory care settings
 - More than 150 million antibiotics prescribed annually
 - 30% of antibiotic prescriptions are either unnecessary or inappropriately prescribed
- Urgent care (UC) centers are an important target for outpatient antimicrobial stewardship initiatives
 - Nearly 85 million visits were reported in 2016
 - 96% reported an increase in patient volumes in 2016

Study Objectives

Purpose

- To evaluate the impact of a pharmacist-led ASP in the urgent care setting

Primary objective

- To compare total guideline-concordant antibiotic prescribing between the Pre-ASP and the Post-ASP groups
 - Defined as the combination of appropriate agent, dose, and duration of therapy

Secondary objectives

- To compare the number of patients who required a follow-up call, time to follow-up contact, UC or Emergency Department (ED) revisit within 72 hours, and hospital admission within 30 days

Figure 1. Collaborative Practice Agreement

Bacterial vaginosis
First-line Treatment Metronidazole 500 mg PO twice daily x 7 days
Alternative therapy Clindamycin 300 mg PO twice daily x 7 days (pregnancy or metronidazole allergy)
Trichomonas vaginalis
First-line Treatment Metronidazole 2 grams PO x 1 dose
Herpes simplex virus
First-line Treatment Acyclovir 400 mg PO three times daily x 7 days
Alternative Therapy Valacyclovir 1 gram PO twice daily x 7 days
Urinary tract infection, uncomplicated, non-pregnant female (based on susceptibility results)
1 st line: Nitrofurantoin (Macrobid) 100 mg PO twice daily x 5 days • CrCl ≥ 30 mL/min
2 nd line: Sulfamethoxazole/trimethoprim DS 1 tab PO twice daily x 3 days
3 rd line: Cephalexin 500 mg PO twice daily x 7 days
4 th line: Amoxicillin/clavulanate 875 mg PO twice daily x 7 days
4 th line: Ciprofloxacin 500 mg PO twice daily x 3 days
Alternatives per culture and sensitivity results.
In accordance with IDSA guideline recommendations and studies demonstrating that UTI treatment success is not entirely dependent on microbial sensitivity to empiric antibiotics, patient's current symptoms will be assessed during follow up calls. Patients whose UTI symptoms have resolved will not be prescribed additional antibiotics. UTI symptoms include: fever, dysuria, urinary urgency, urinary frequency and acute non-mechanical abdominal or flank pain.
Urinary tract infection, complicated Includes: males, pyelonephritis, structural abnormality
1 st line: Sulfamethoxazole/trimethoprim DS 1 tab PO twice daily x 7 days
2 nd line: Ciprofloxacin 500 mg PO twice daily x 7 days

Methods

Study Site

- Mercy Health Saint Mary's Urgent Care Centers, Grand Rapids, MI
 - Two, free-standing centers
 - 32,000 visits/year
 - No on-site pharmacist

Urgent Care ASP

- Implemented in 2015
- Provider education and orientation to stewardship resources
 - Outpatient empiric therapy guidelines
 - Antibiograms
- Culture follow-up via a collaborative practice agreement
- Conducted by hospital campus pharmacy team on weekdays
 - 1.0 FTE ASP/infectious diseases pharmacist
 - 2.0 FTE emergency medicine pharmacist
 - PGY-1 pharmacy residents and P4 pharmacy students

Study Design

- Retrospective quasi-experimental
 - Pre-ASP: January 1 – December 31, 2014
 - Post-ASP: January 1 – December 31, 2016

Inclusion	Exclusion
<ul style="list-style-type: none"> Positive urine or wound culture Patients discharged following care at a Mercy Health Urgent Care facility 	<ul style="list-style-type: none"> Epididymitis diagnosis Patients requiring inpatient admission Patients with no documentation of follow-up activities (e.g. left against medical advice)

3 rd line: Cephalexin 500 mg PO twice daily x 14 days
3 rd line: Amoxicillin/clavulanate 875 mg PO twice daily x 14 days
Alternatives per culture and sensitivity results.
In accordance with IDSA guideline recommendations and studies demonstrating that UTI treatment success is not entirely dependent on microbial sensitivity to empiric antibiotics, patient's current symptoms will be assessed during follow up calls. Patients whose UTI symptoms have resolved will not be prescribed additional antibiotics. UTI symptoms include: fever, dysuria, urinary urgency, urinary frequency and acute non-mechanical abdominal or flank pain.
Urinary tract infection and asymptomatic bacteriuria, pregnant female
1 st line: Nitrofurantoin (Macrobid) 100 mg PO twice daily x 5 days • CrCl must be ≥ 30 mL/min • Do not use if > 38 weeks
2 nd line: Cephalexin 500 mg twice daily x 7 days
3 rd line: Amoxicillin/clavulanate 875 mg PO twice daily x 7 days
Alternatives per culture and sensitivity results.
Urinary tract infection, pediatric (based on susceptibility results)
1 st line: Cephalexin dosed and dosage form per age/weight, cap/liquid 50 mg/kg/day in divided doses, two times daily x 7 days
2 nd line: Nitrofurantoin suspension 5-7 mg/kg/day divided four times daily x 7 days (if patient is able to take capsules, may use 100 mg capsules BID)
2 nd line: Sulfamethoxazole/trimethoprim appropriate dosage form (weight based) tab/liquid 8 mg/kg of the trimethoprim component per day, PO twice daily x 7 days
3 rd line: Amoxicillin/clavulanate dosed and dosage form per age/weight, tab/liquid 25 mg/kg/day of the amoxicillin component in two divided doses x 7 days
Alternatives per culture and sensitivity results.
Fluoroquinolones will not be prescribed without discussion with an ED provider.
Nitrofurantoin will not be used if there is concern for pyelonephritis.
Duration of therapy for beta-lactam antibiotics will be adjusted to 14 days if there is concern for pyelonephritis.
In accordance with IDSA guideline recommendations and studies demonstrating that UTI treatment success is not entirely dependent on microbial sensitivity to empiric antibiotics, patient's current symptoms will be assessed during follow up calls. Patients whose UTI symptoms have resolved will not be prescribed additional antibiotics.

Results

Baseline Demographics

	Pre-ASP (n=150)	Post-ASP (n=150)	p-value
Age, years, ± SD	35.3 ± 19.6	37.7 ± 21.1	0.299
Male, n (%)	43 (28.7)	42 (28)	0.898
Uninsured, n (%)	6 (4)	9 (6)	0.074
No medication allergies, n (%)	104 (69.3)	100 (66.7)	0.621
Provider Type, n (%)			<0.001
Physician provider	147 (98)	86 (57.3)	
Midlevel provider	3 (2)	64 (42.7)	
Culture Type, n (%)			1.0
Urine	100 (66.7)	100 (66.7)	
Wound	50 (33.3)	50 (33.3)	

Primary Outcome

Total Antimicrobial Prescribing Appropriateness

	Pre-ASP (n=150)	Post-ASP (n=150)	p-value
All diagnoses, n (%)	62 (41.3)	80 (53.3)	0.037
Urine subgroup, n (%)	43 (43)	58 (58)	0.034
Wound subgroup, n (%)	19 (38)	22 (44)	0.542

Secondary Outcomes

Figure 2. Appropriateness of antimicrobial prescribing for patients who received antibiotics

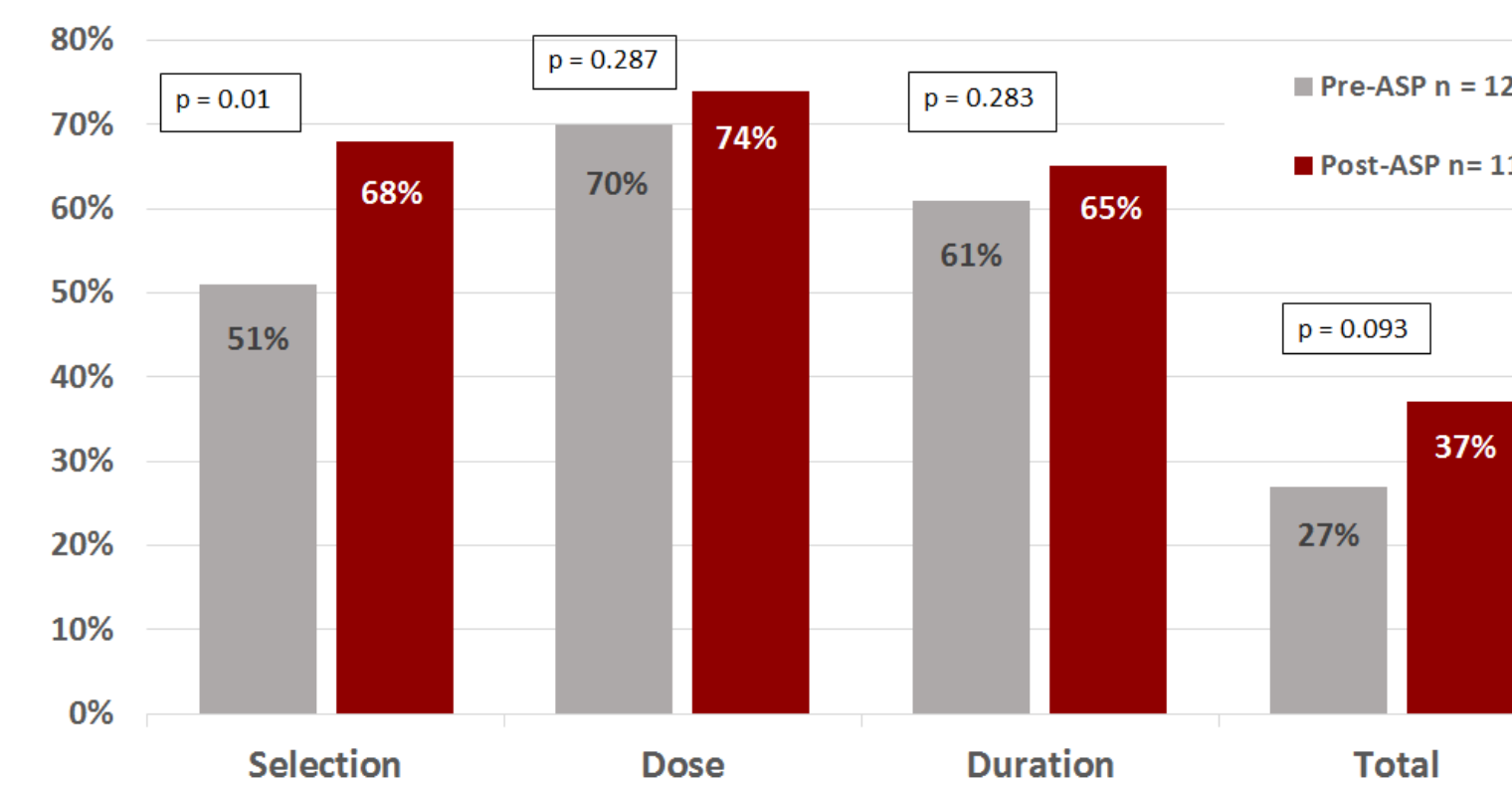
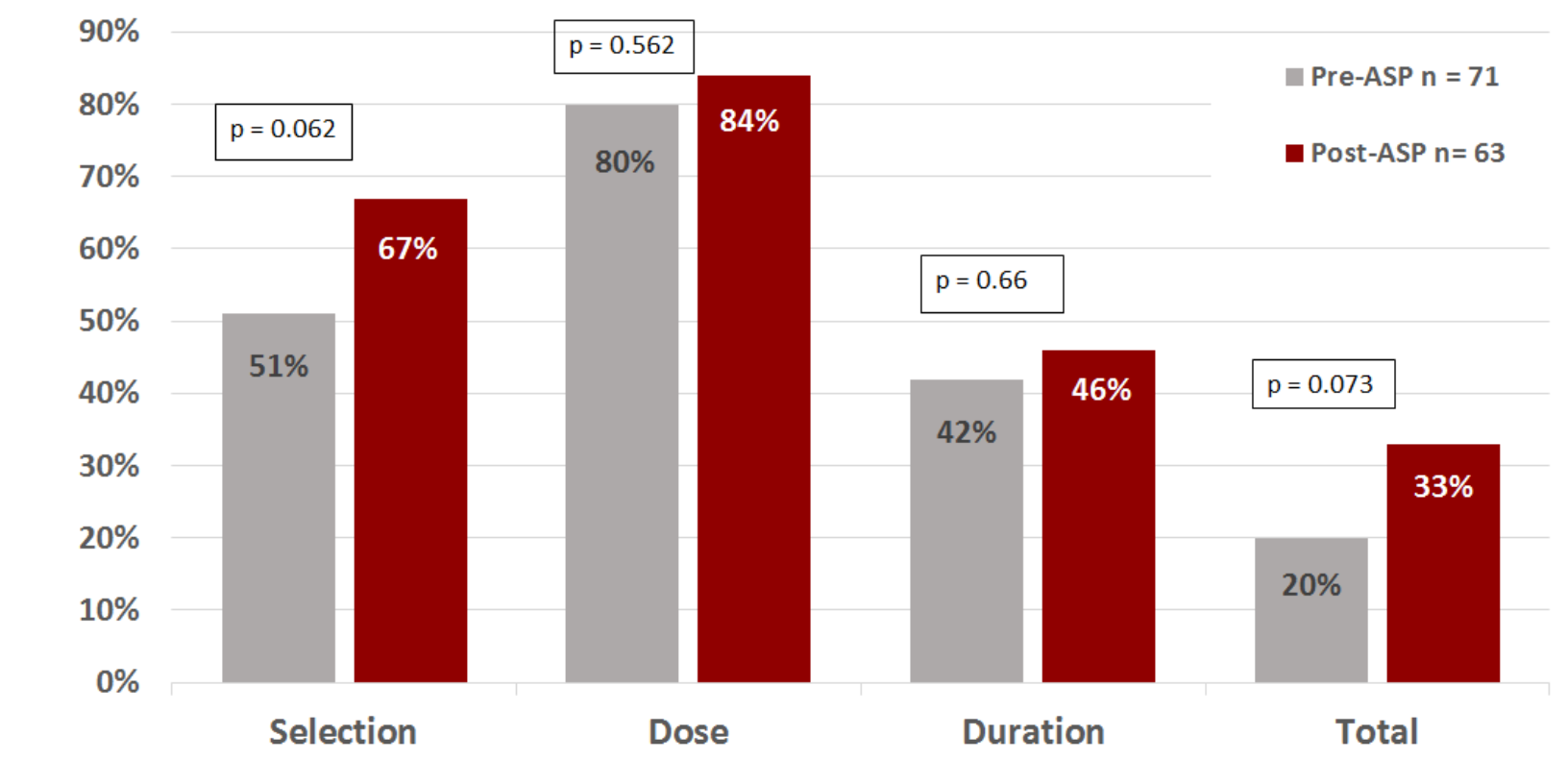


Figure 3. Subgroup: Appropriateness of antimicrobial prescribing for patients who received antibiotics for UTI



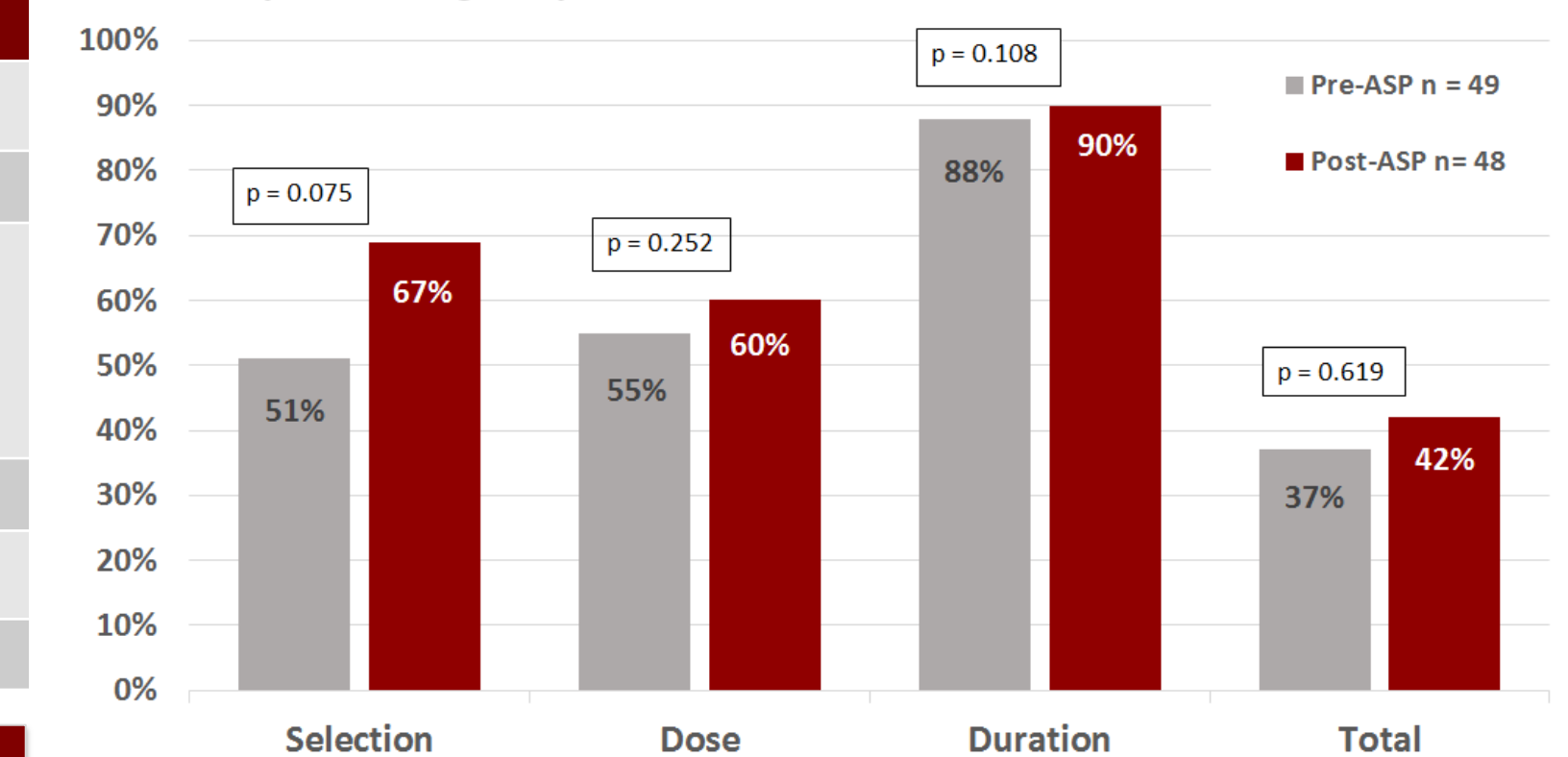
Follow-Up Interventions & Outcomes

	Pre-ASP (n=150)	Post-ASP (n=150)	p-value
Patients requiring follow-up, n (%)	27 (18)	16 (10.7)	0.07
Time to follow-up, hr, median (range)	38 (10-87)	71 (48-120)	<0.01
Reason for follow-up, n (%)			0.129
Susceptibility mismatch	12 (63.2)	8 (61.5)	
No antibiotic at discharge	3 (15.8)	1 (7.7)	
Multiple antibiotics at discharge	1 (5.3)	4 (30.8)	
New prescription issued, n (%)	13 (68.4)	3 (23.1)	0.012
UC or ED revisit ≤ 72 hours, n (%)	5 (3.3)	4 (2.6)	1.0
Hospital admission ≤ 30 day, n (%)	5 (3.3)	3 (2)	0.723

Conclusions & Future Directions

- The presence of a pharmacist-led urgent care culture follow-up program is associated with significantly improved total antimicrobial prescribing
- Significantly less new prescriptions were issued at follow-up in the post-ASP group
- The impact of ASP in urgent cares could be improved by continuous education, implementing audit and feedback, and printing microbiology reports on weekends

Figure 4. Subgroup: Appropriateness of antimicrobial prescribing for patients who received antibiotics for wounds



References

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- Suda KJ, et al. J Antimicrob Chemother. 2013;68:715-8.