

Effect of Automatic Antimicrobial Stop Orders on Length of Therapy for Treatment of Urinary Tract and Intra-Abdominal Infections



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Background

- Up to 50% of antimicrobial use in the inpatient setting is inappropriate, and one third of inappropriate treatment days are attributed to prolonged therapy.^{1,2}
- The Center for Diseases Control recommends the use of time sensitive automatic antimicrobial stop orders (ASO) with an emphasis on surgical prophylaxis.³
- Studies evaluating the use of ASO in lower respiratory tract infections report discordant results on ASO's effect on length of therapy.^{4,5}
- Current literature does not address the effects on broad spectrum, outpatient duration, and length of therapy (LOT) versus days of therapy (DOT).

Methods and Primary Outcome

The objective of this study is to determine if there is a difference in length of antimicrobial therapy with the use of ASOs for urinary tract (UTI) and intra-abdominal infections (IAI).

- Multi-center, retrospective cohort study at five adult hospitals
- Review from 11/2014 to 11/2018 to capture 2016 implementation of ASO

Patient Identification by ICD 9/10 Codes	
Inclusion Criteria	Exclusion Criteria
<ul style="list-style-type: none"> Age ≥ 18 years Diagnosis code of UTI or IAI Source control within 48 hours of starting antimicrobials for IAI At least 48 consecutive hours of intravenous antimicrobial 	<ul style="list-style-type: none"> Pregnancy Concomitant documented infection Prophylactic antimicrobial administration

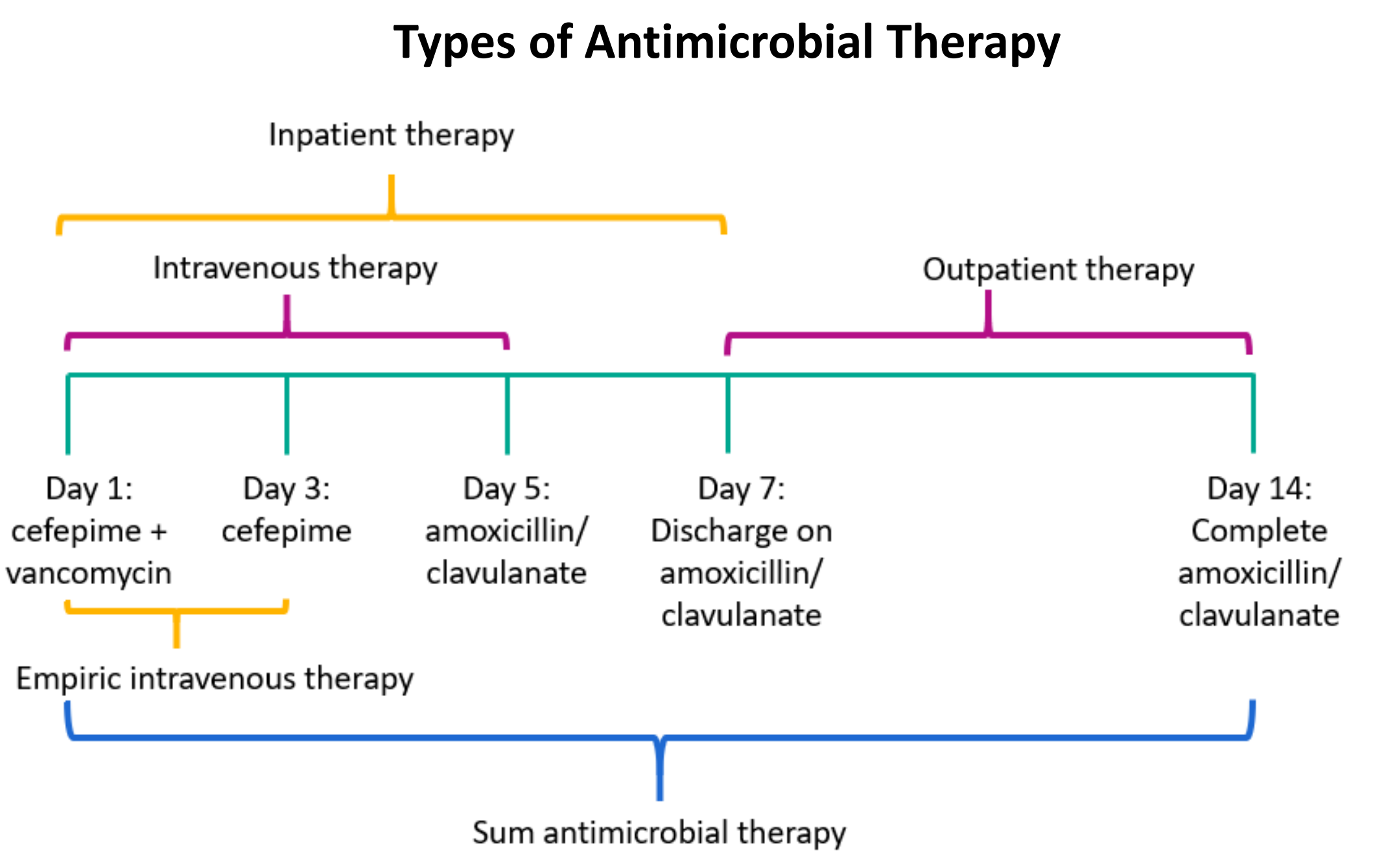
Primary Outcome

- Antimicrobial length of therapy in intra-abdominal and urinary tract infections

Definitions

Days of therapy (DOT)	Length of therapy (LOT)
Number of calendar days in which at least 1 dose of an antimicrobial was given, counting separate agents individually , based on electronic MAR data	Number of calendar days in which at least 1 dose of an antimicrobial was given without regard to the number of antimicrobials that were given

Definitions, continued

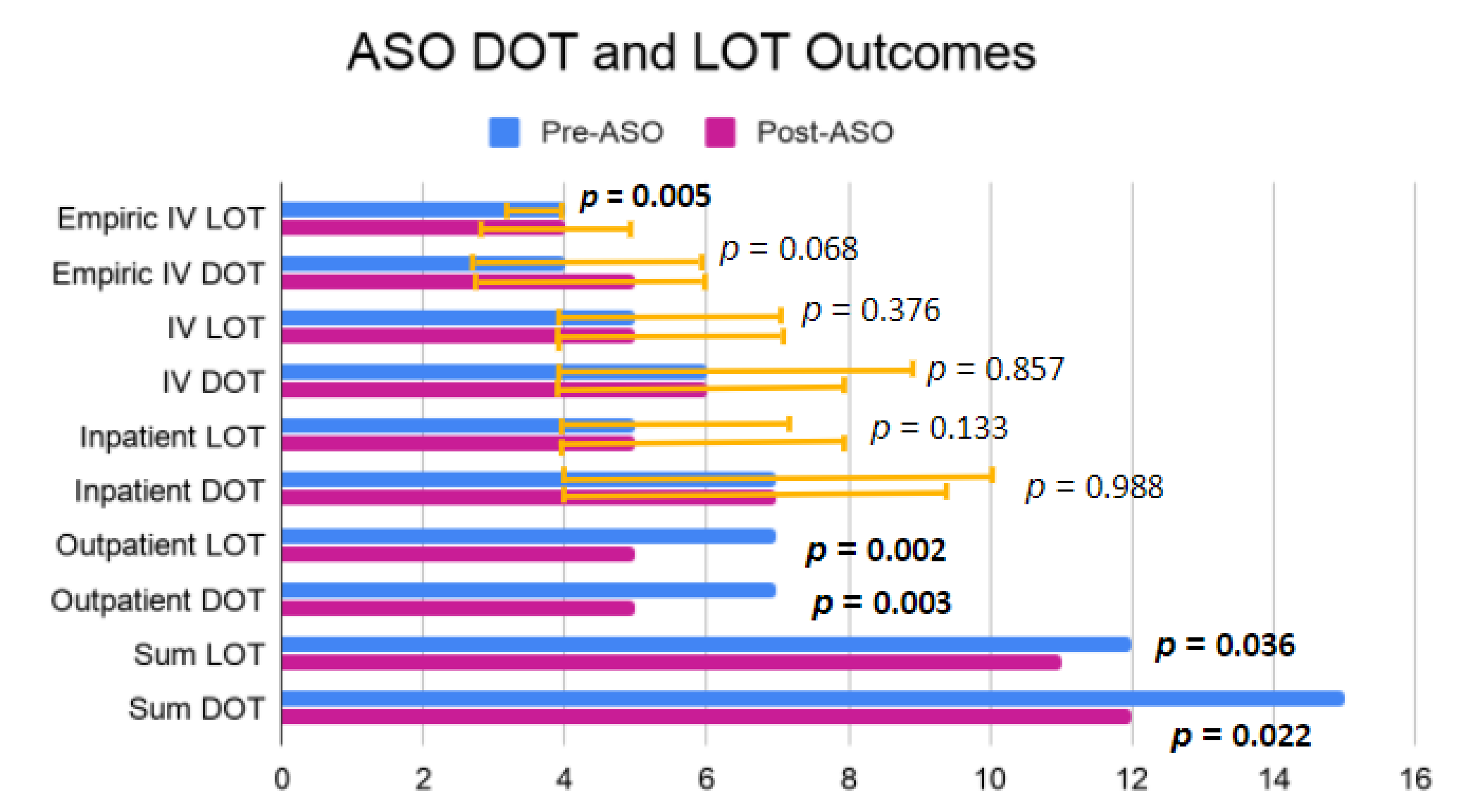


Results

Baseline Demographics

	Pre-ASO (n = 119)	Post-ASO (n = 121)
Age in years, median (IQR)	54 (37-72)	59.5 (47-69)
Male, n (%)	50 (42.0)	45 (37.2)
Previous admission within 90 days, n (%)	26 (21.8)	35 (28.9)
Mean WBC at day 1 of therapy	12.41 +/- 6.3	14.31 +/- 7.2
Tmax (°F) at day 1 of therapy, median (IQR)	99.5 (98.6-101.6)	99.3 (98.6-100.3)
SOFA Score, median (IQR)	1 (0 - 2)	1 (0-2)
ICU, n (%)	21 (17.6)	26 (21.5)
Mechanical Ventilation, n (%)	7 (5.9)	5 (4.1)
Median Charlson (IQR)	0 (0-2)	0 (0-0)
Type of Infection, n (%)		
UTI	59 (49.6)	59 (48.8)
IAI	60 (50.4)	62 (51.2)
UTI Type, n (%)		
Cystitis	8 (13.6)	5 (8.5)
Pyelonephritis	19 (32.2)	25 (42.4)
Unspecified	32 (54.2)	29 (49.1)
IAI Source, n (%)		
Abscess	11 (18.3)	15 (24.2)
Appendicitis	25 (41.7)	23 (51.6)
Diverticulitis	9 (15)	11 (17.7)
Other	30 (25)	32 (26.5)

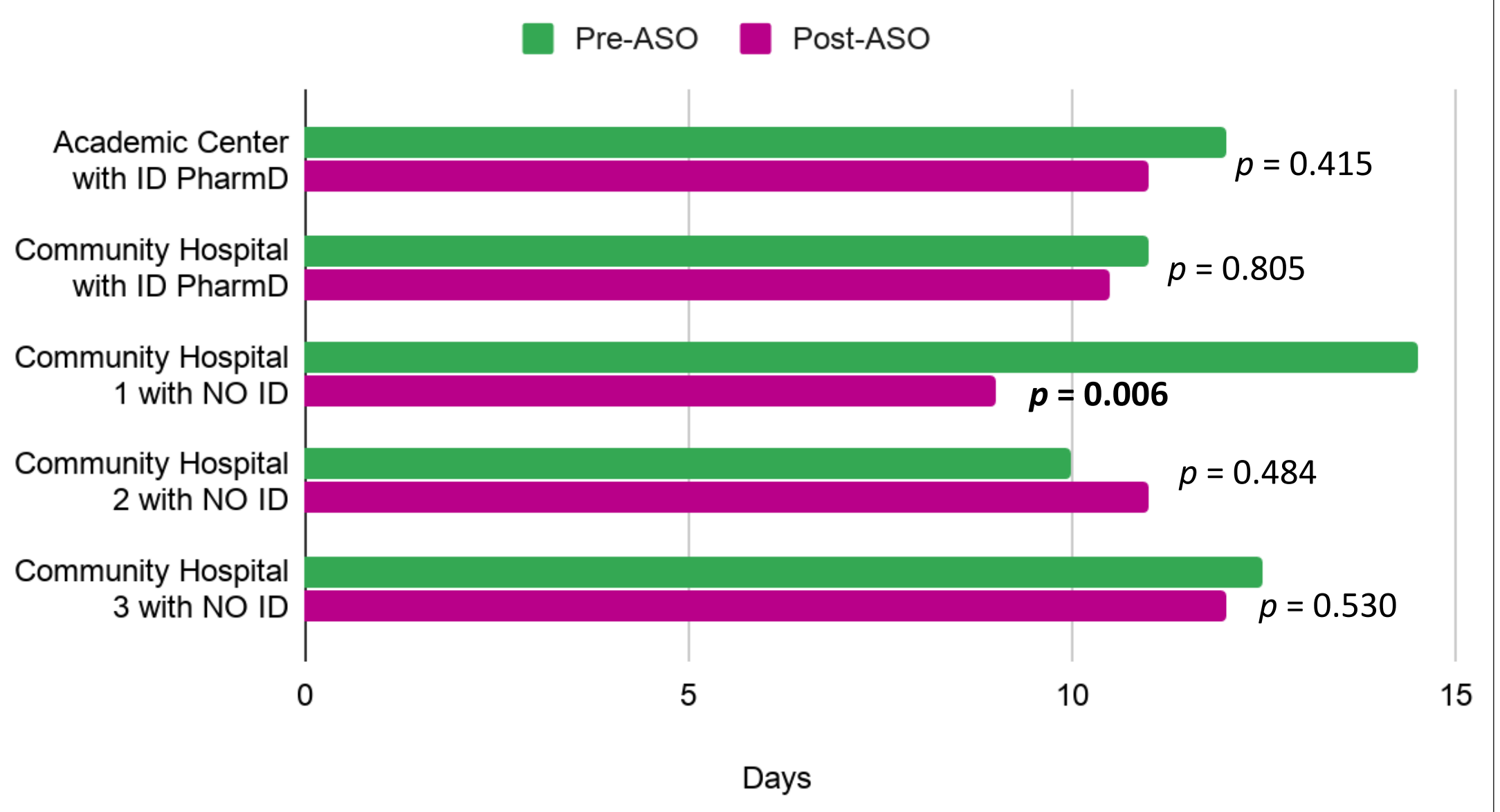
Results, continued



Secondary Outcomes

Endpoint	Pre-ASO (n=119)	Post-ASO (n=121)	p value
Length of MRSA therapy days (IQR)	0 (0-0)	0 (0-0)	0.4797
Length of Pseudomonas therapy days (IQR)	4 (0-8)	4 (0-8)	0.6579
<i>C. difficile</i> within 90 days, n (%)	1 (0.84)	1 (0.83)	1.00
Length of stay (IQR)	4 (3-6)	5 (4-8)	0.0689
All cause in hospital mortality, n (%)	1 (0.84)	1 (0.83)	1.00
30 day readmission, n (%)	16 (13.4)	17 (14.1)	0.892

Sum LOT by Hospital Site



Discussion

- While ASO shortens sum LOT in the treatment of UTI and IAI, it appears to have the largest impact on outpatient therapy and little effect on inpatient therapy.
- Changes in length of outpatient therapy may be attributed to increased pharmacist involvement with medication discharge reconciliation and counseling.
- One community hospital with no infectious diseases pharmacist had the largest differences in outcomes with ASO. This may have been impacted by a newly hired pharmacy clinical specialist who began quarterly stewardship meetings and initiatives.
- Ten patients missed an average of 1.9 doses with no clinical worsening noted. The implication of missed doses may be greater if patients have a higher severity of illness.

Study Critique

Strengths	Limitations
<ul style="list-style-type: none"> Diverse, multicenter study Evaluation of various metrics (LOT, DOT) First evaluation of ASO effect on discharge therapy 	<ul style="list-style-type: none"> Low severity of illness No evaluation of UTI vs asymptomatic bacteriuria

Conclusions

Use of ASOs decreases sum length of therapy in the treatment of UTI and IAI. These findings are largely attributed to ASO's effect on decreasing discharge prescription length of therapy. ASO has little effect on inpatient length of therapy, and sites without an infectious diseases pharmacist seem to benefit most from ASO.

References

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