

Evaluation of the Impact of an Antimicrobial Stewardship Program Initiative in Patients with Uncomplicated Acute Bacterial Skin and Skin Structure Infections

Monika A. Murillo, MD;¹ Tamara L. Trienski, PharmD;² Derek N. Bremmer, PharmD, BCPS;⁴ Noreen H. Chan-Tompkins, PharmD, BCPS-AQ ID;² Lynn Chan, PharmD;² Chelsea I. Konopka, PharmD;² Michael J. Burkitt, MD, MPH;³ Matthew A. Moffa, DO;^{1,5} Courtney Watson, MPH;⁶ Thomas L. Walsh, MD^{1,5}

¹Allegheny General Hospital, Division of Infectious Diseases ²Allegheny General Hospital, Department of Pharmacy ³Allegheny General Hospital, Division of Hospital Medicine ⁴Western Pennsylvania Hospital, Department of Pharmacy, ⁵Western Pennsylvania Hospital, Division of Infectious Diseases, ⁶Allegheny General Hospital, Center for Inclusion Health Pittsburgh, PA



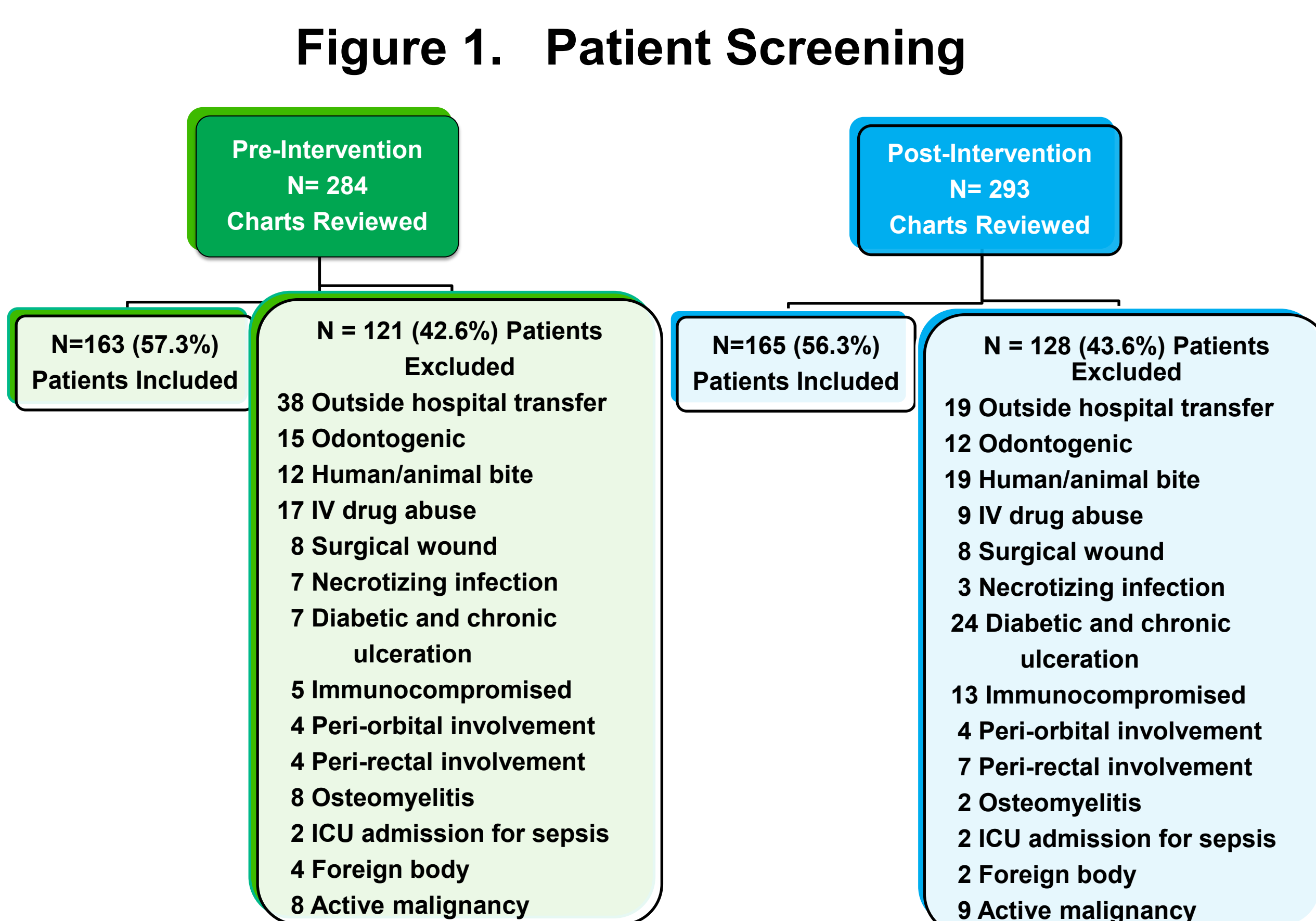
Monika A. Murillo, MD
 Department of Infectious Diseases
 Allegheny General Hospital
 420 E. North Avenue, Suite 407
 Pittsburgh, PA 15212
 (412) 359-6786
 monika.murillo@ahn.org

Background

Acute bacterial skin and skin structure infections (ABSSSIs) are often associated with unnecessary use of broad-spectrum antibiotics (1). Prevention of unnecessary diagnostic studies and the use of broad-spectrum and prolonged antimicrobial therapy could lead to substantial reductions in health care costs and antibiotic use, providing important targets for antimicrobial stewardship programs (ASP) (2). An ASP ABSSSI initiative, which included extensive physician education and individual patient review by either an ASP pharmacist and/or physician, was implemented in August 2015 at both Allegheny General Hospital (AGH) and Western Pennsylvania Hospital (WPH).

Methods

A retrospective chart review was conducted for uncomplicated ABSSSI patients admitted to AGH and WPH from August 1, 2014 through March 31, 2015 for the pre-intervention group and from August 1, 2015 through March 31, 2016 for the post-intervention group. Outcomes assessed included: patient demographics, length of stay (LOS), site of infection, treatment duration, spectrum of antimicrobial coverage, microbiologic cultures, imaging utilization and 30 day readmission. This project was deemed a quality improvement project (exempt review) by our Institutional Review Board (IRB).



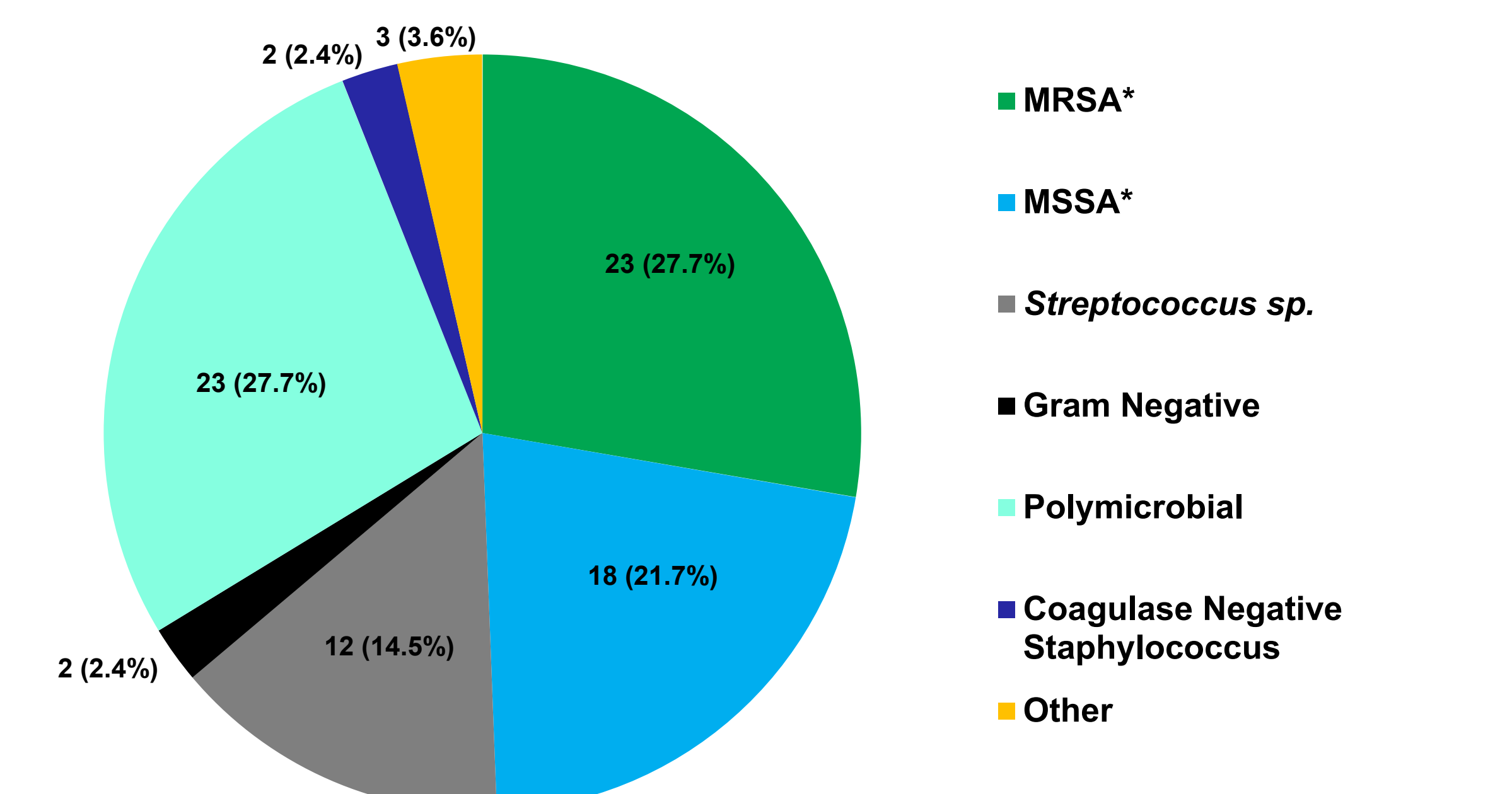
Results

Table 1. Demographics

	Pre-Intervention (n = 163)	Post-Intervention (n = 165)	P value
Age (years) ¹	55.3 ± 19.2	52.5 ± 19.1	0.18
Male sex ²	84 (51.5)	88 (55.3)	0.83
Hospital length of stay (days) ¹	3.7 ± 2.6	2.2 ± 1.3	<0.001
Ethnicity ²			0.99
• Caucasian	132 (80.9)	134 (81.2)	
• African American	25 (15.3)	25 (15.1)	
• Other	6 (3.7)	6 (3.6)	
Site of infections ²			0.75
• Leg	110 (67.5)	108 (65.4)	
• Arm	36 (22.1)	32 (19.4)	
• Trunk	6 (3.7)	7 (4.2)	
• Face	5 (3.1)	8 (4.9)	
• Other	6 (3.7)	10 (6.1)	
Purulence ²			0.17
• Yes	49 (30.1)	38 (23.0)	
• No	114 (69.9)	127 (77.0)	

¹ Mean ± standard deviation, ² Number of patients (percentage)

Figure 2. Wound Culture Organisms in Combined Pre- and Post Intervention Groups (n = 83)



*MRSA : Methicillin-resistant *Staphylococcus aureus*, MSSA: Methicillin-susceptible *Staphylococcus aureus*

Table 2. Blood Cultures and Imaging Utilization

	Pre-Intervention (n = 163)	Post-Intervention (n=165)	P value
Blood Cultures ¹	127 (77.9)	122 (73.9)	0.44
CT ¹	29 (17.8)	21 (12.7)	0.37
MRI ¹	13 (8.0)	8 (4.8)	0.27
X-ray ¹	93 (57.1)	82 (49.7)	0.19

¹ Number of patients (percentage)

Table 3. Inappropriate Antibiotic Selection for >24 hours

	Pre-Intervention (n=163)	Post-Intervention (n=165)	P value
Gram-negative coverage ¹	73 (44.8)	16 (9.7)	<0.001
Anaerobic coverage ¹	65 (39.9)	17 (10.3)	<0.001
Anti-pseudomonal coverage ¹	28 (17.2)	3 (1.8)	<0.001

¹ Number of patients (percentage)

Figure 3. Antibiotic Treatment Duration

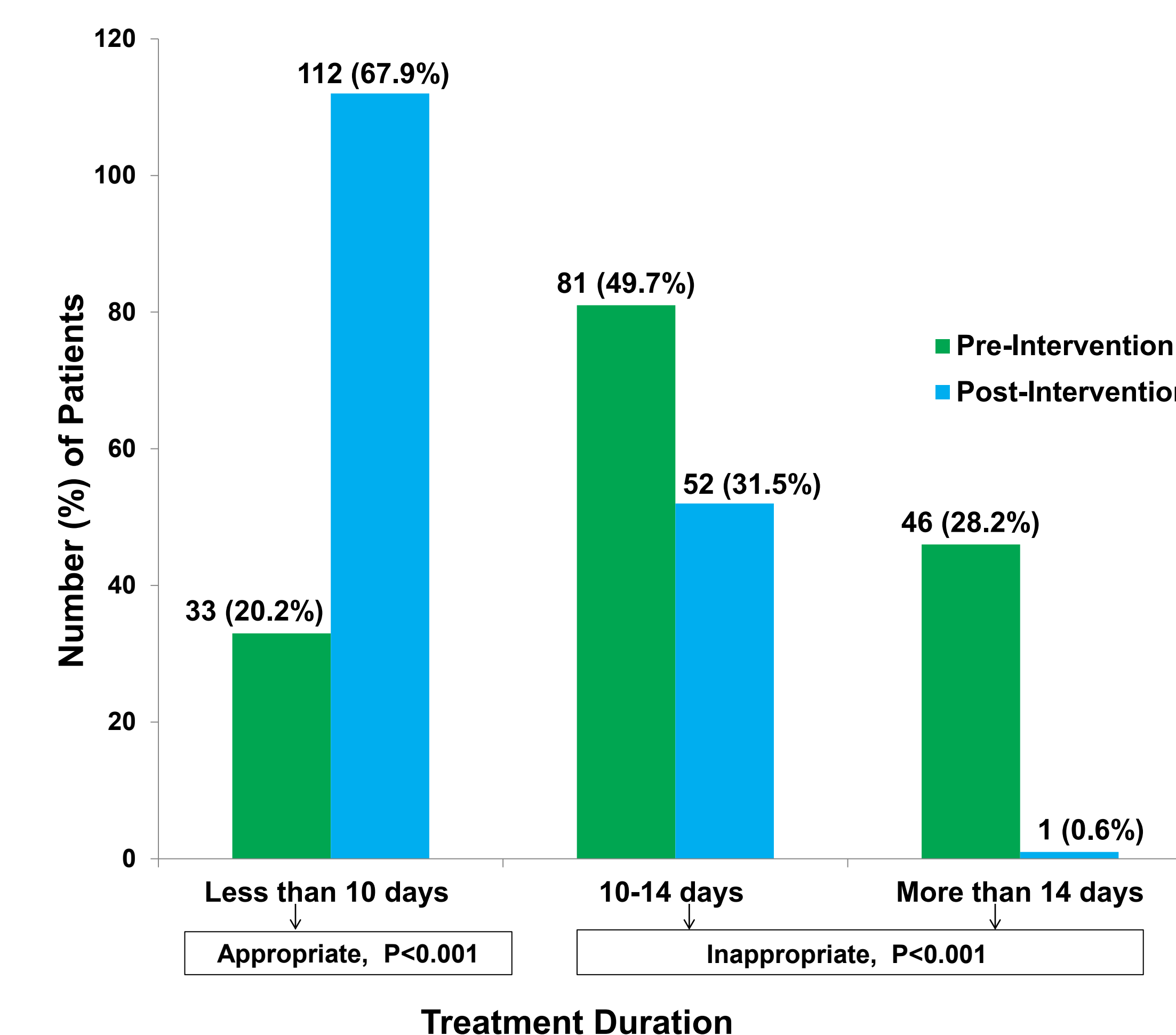


Figure 4. 30 Day Readmission

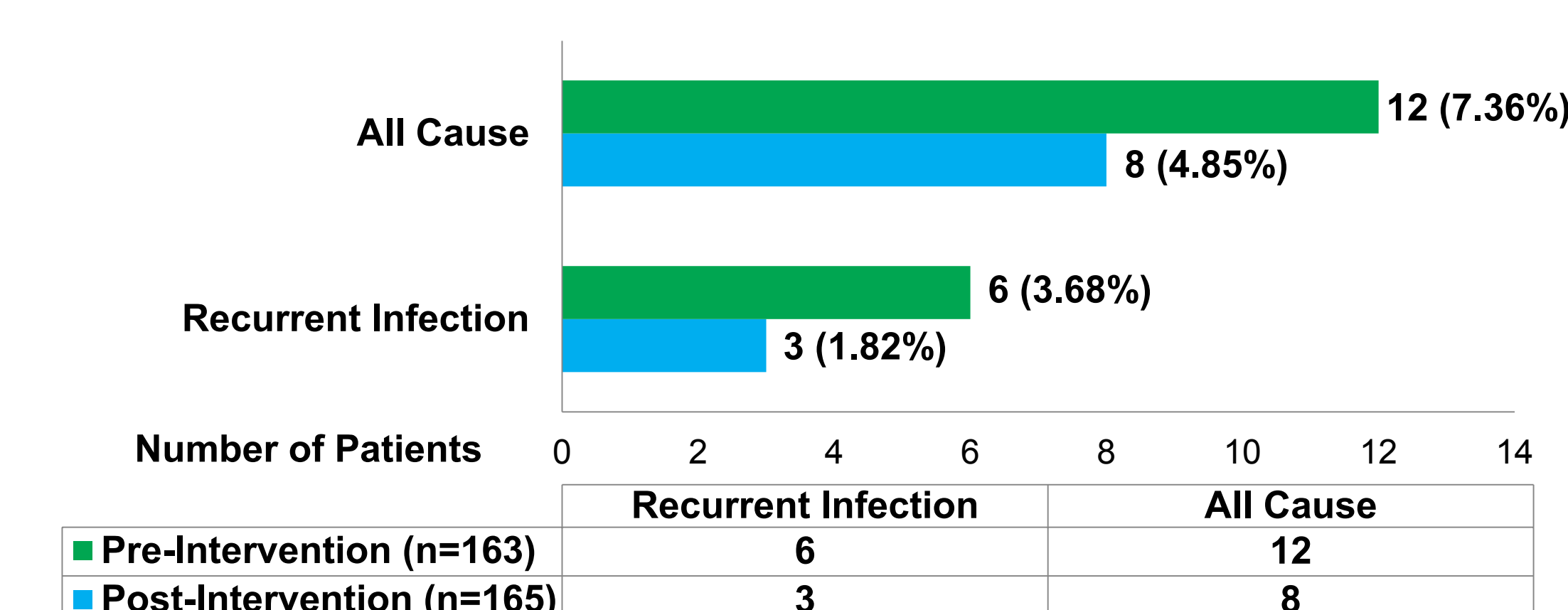
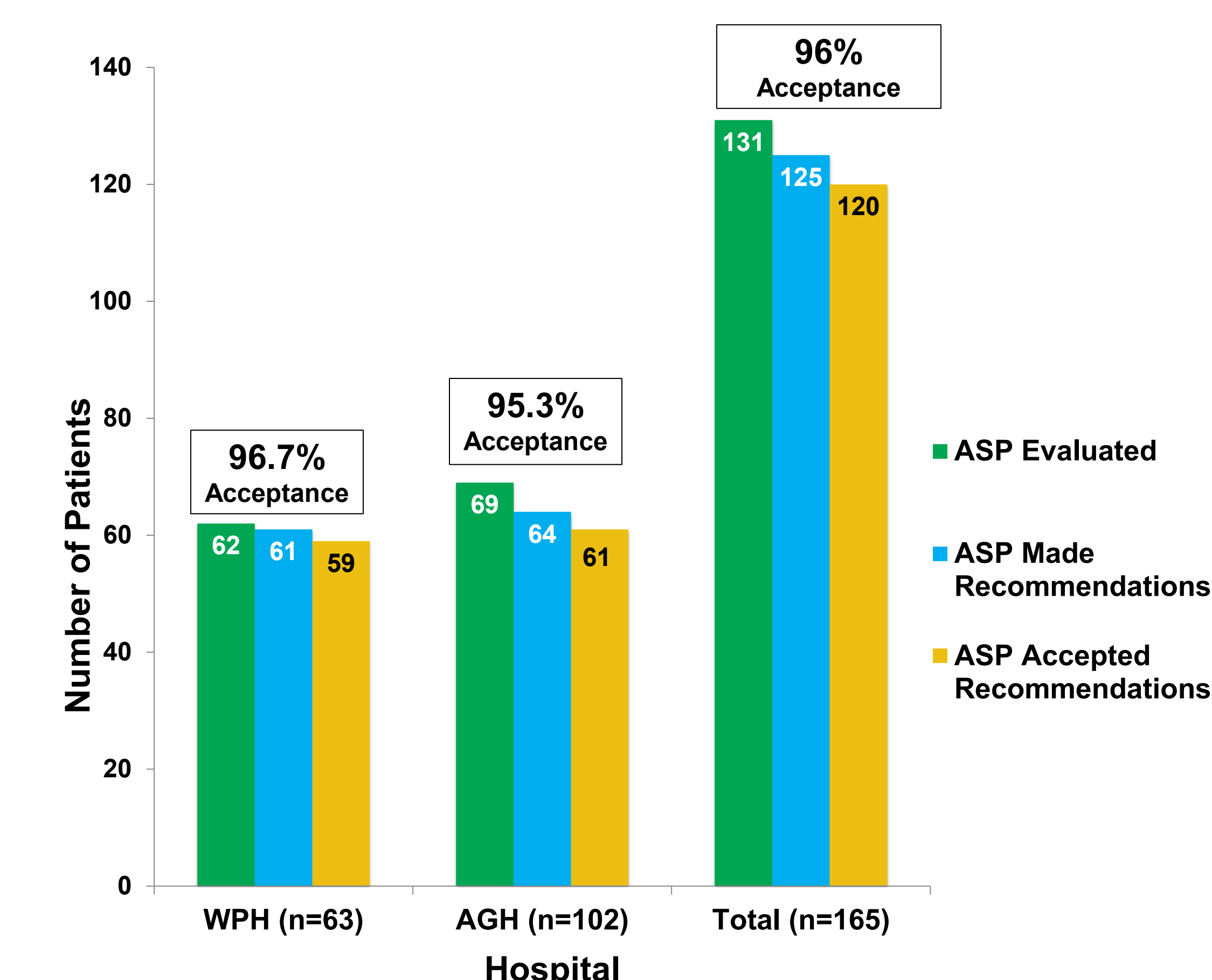


Figure 5. ASP Evaluation and Recommendations



Conclusions

- An increase in the number of patients receiving an appropriate treatment duration of less than 10 days was seen in the post-intervention group.
- A reduction in the number of patients receiving broad spectrum antibiotics was seen in the post-intervention group.
- A decrease in LOS and 30 day readmission was seen in the post intervention group.
- A high percentage of antimicrobial stewardship interventions were accepted.
- This study illustrated a positive impact of an ASP initiative in patients with uncomplicated ABSSSIs.

References

1. Pasquale TR, Trienski TL, Olexia DE, Myers JP, Tan MJ, et. al. Impact of an antimicrobial stewardship program on patients with acute bacterial skin and skin structure infections. American Journal Health-System Pharmacy. 2014;71:1136-9.
2. Jenkins TC, Sabel AL, Sarcone EE, Price CS, Mehler PS, Burman WJ. Skin and Soft tissue infections requiring hospitalization at an academic medical center: Opportunities for antimicrobial stewardship. Clinical Infectious Diseases. 2010;51:895-903.