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Background

- Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America recognize two Antimicrobial Stewardship Programs (ASP)¹
 - Prospective audit with intervention and feedback to prescribers
 - Formulary restriction with prior authorization requirements
- Although the positive impact of each of these methods is well-documented, a direct comparison of the two strategies is lacking¹⁻⁴
- The Antimicrobial Stewardship Program at the Hospital of the University of Pennsylvania was initiated in 1993 and focused primarily on prior authorization
- In 2009, several broad-spectrum agents were de-restricted, including cefepime, vancomycin, and piperacillin/tazobactam, and these agents were monitored via prospective audit and feedback

Objectives

Primary Objective:

- Determine the frequency of streamlined antimicrobials during the prior authorization ASP model compared to the prospective audit and feedback ASP model

Secondary Objective:

- Determine the time to streamlining from receipt of susceptibility report between groups

Methods

Patient Population:

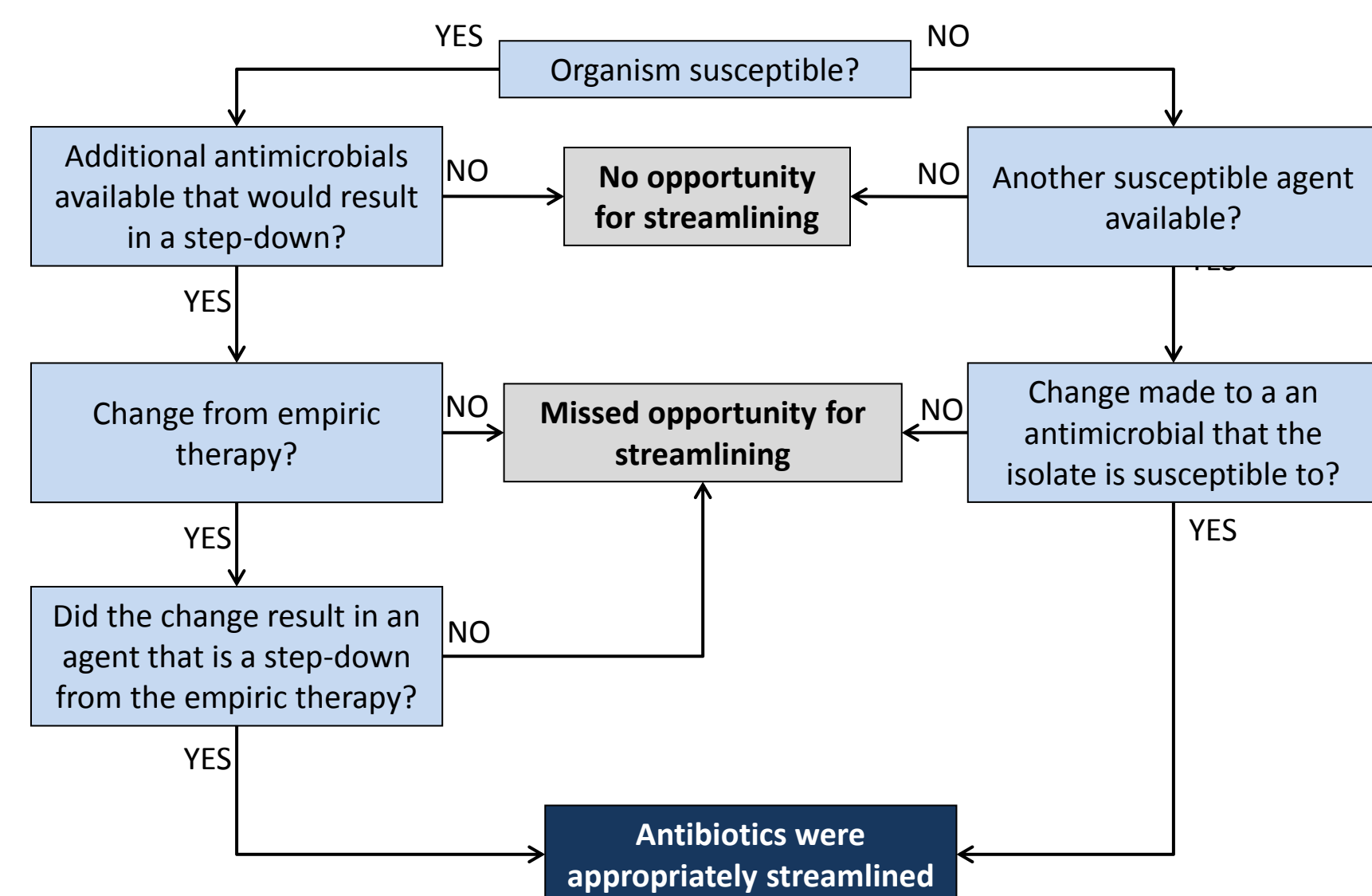
- Patients > 18 years old with a positive blood culture with one of the following organisms
 - Staphylococcus aureus*
 - Enterococcus spp.*
 - All aerobic gram negative organisms
- Polymicrobial infections and patients whose antibiotics were discontinued < 48 hours after receipt of susceptibility report were excluded

Definitions:

- Pre-intervention: May 18, 2008 through May 31, 2009 (Prior authorization ASP)
- Wash-out period: June 2009
- Post-intervention: July 1, 2009 through June 30, 2011 (Prospective audit and feedback ASP)

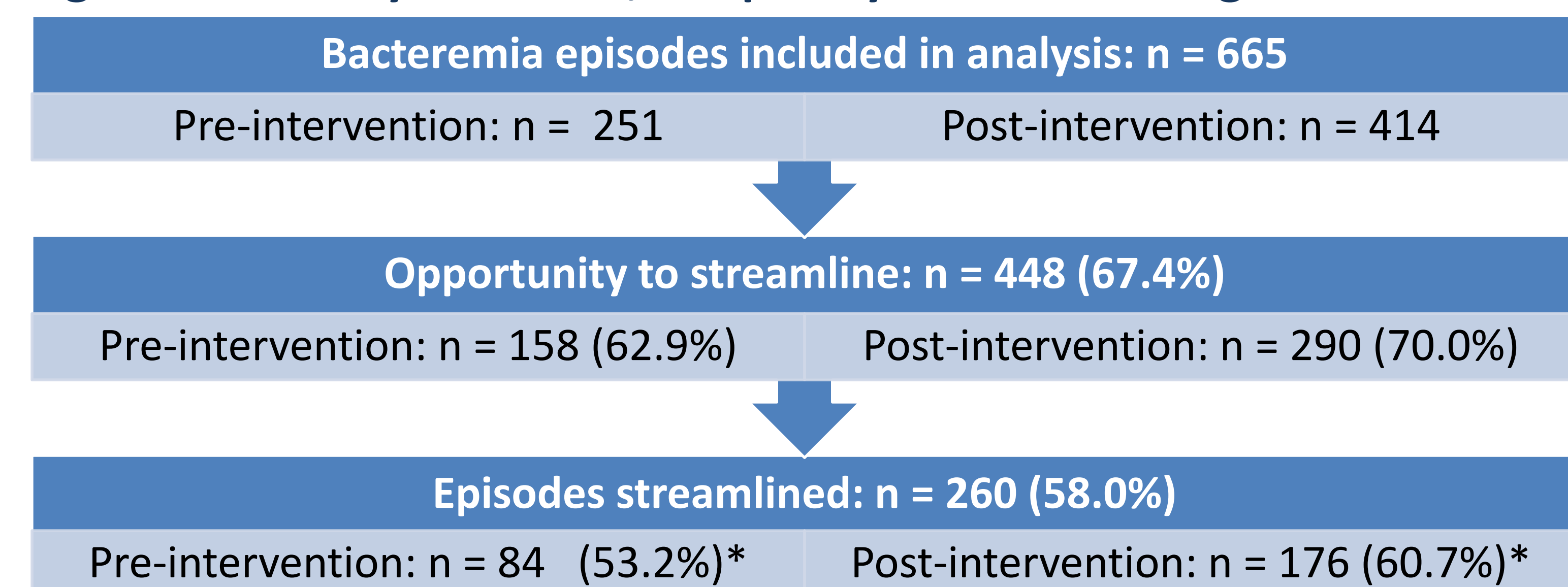
Opportunity to Streamline:

- Assessed via an algorithm developed by study investigators based on antimicrobial agents' spectrum of activity



Results

Figure 1: Primary Outcome, Frequency of Streamlining Antimicrobials



*p = 0.123

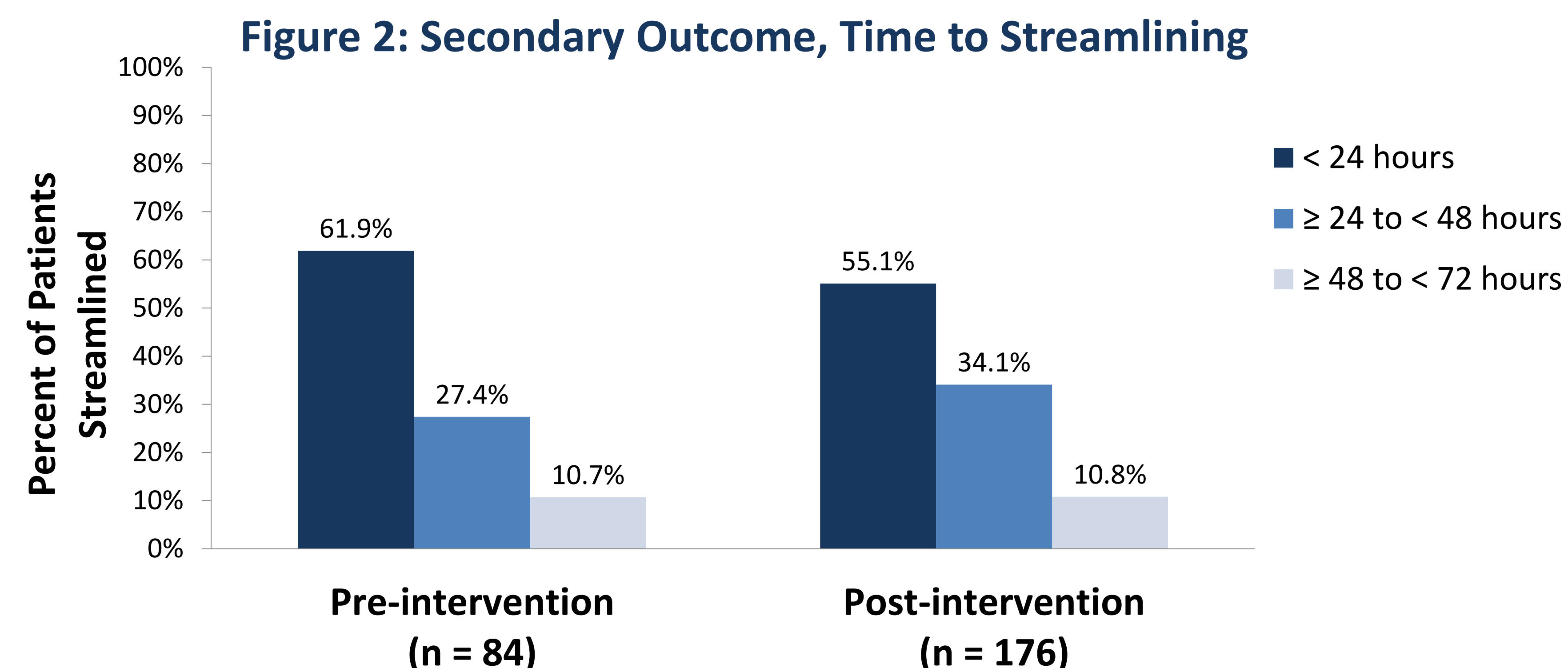


Table 1: Univariate Analysis, Potential Factors Associated with Streamlining

Variable	Streamlined (n = 260)	p value
Sex, n (%)		
Female	109 (58.9)	0.751
Male	151 (57.4)	
Admitting Service, n (%)		
Medical	179 (62.8)	0.011
Surgical	80 (50.3)	
# of Episodes per Patient, n (%)		
< 2	227 (58.2)	0.851
≥ 2	33 (56.9)	
Organism, n (%)		
Gram positive organism	136 (75.6)	< 0.001
Gram negative organism	124 (46.3)	
β-lactam Allergy, n (%)		
No	237 (61.6)	< 0.001
Yes	23 (36.5)	

Results

Table 2: Multivariate Analysis, Factors Associated with Streamlining

Variable	% Patients Streamlined		OR (95% CI)	Test for homogeneity p value
	Pre-intervention (n=158)	Post-intervention (n=290)		
β-lactam allergy				
No	54.7	65.3	1.53 (0.974 - 2.39)	0.160
Yes	42.9	33.3	0.667 (0.201 - 2.27)	
Admitting Service				
Medical	53.1	67.9	1.86 (1.09 - 3.16)	0.0395
Surgical	55.2	47.5	0.705 (0.349 - 1.42)	
Admission Source				
Routine	52.6	40.0	0.575 (0.232 - 1.42)	0.017
ED	51.4	71.6	2.32 (1.24 - 4.34)	
OSH Transfer	60.0	56.8	0.876 (0.389 - 1.96)	
Organism				
Gram Positive	74.6	76.1	1.08 (0.507 - 2.28)	0.230
Gram Negative	39.7	51.4	1.85 (1.06 - 3.25)	

Conclusions

- Among patients with an opportunity to streamline antimicrobial therapy for the treatment of bacteremia, an ASP model utilizing prospective audit and feedback resulted in a modestly higher proportion of episodes streamlined compared to prior authorization alone
- Absence of a β-lactam allergy, gram-positive bacteremia, and admitting service were all factors associated with an increased frequency of streamlining
- As indicated by the bivariate analysis, patients on the medical service benefited the most from the prospective audit and feedback ASP model

References:

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Disclosures: JMM is currently an employee of GlaxoSmithKline.