

Impact of Accelerate Pheno™ System on Time to De-escalation of Antimicrobial Therapy



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Background

- Rapid diagnostic tests enable timely initiation of optimal antimicrobial therapy, which may improve patient outcomes.^{1,2}
- Accelerate Pheno™ is a novel rapid diagnostic system that provides organism identification (ID) and antimicrobial susceptibility testing (AST) within 7 hours of growth in blood cultures.^{1,2}
- The objective of this study was to determine the impact of the Accelerate Pheno™ system on time to de-escalation of antimicrobial therapy.

Methods

Study Design

- Retrospective quasi-experimental, observational cohort study
- Pre-Implementation Group:** 9/1/2017-8/31/2018
 - VITEK MS and VITEK 2 for organism ID and AST
- Post-Implementation Group:** 9/1/2018-8/31/2019
 - Accelerate Pheno™ system for organism ID and AST

Inclusion Criteria

- Age 18-89 years
- Positive blood culture(s)
- Receiving intravenous antimicrobial therapy within 24 hours of blood cultures being drawn

Exclusion Criteria

- Polymicrobial blood culture
- Positive cultures from another sterile site with a different organism that requires antimicrobial treatment
- Patients expired or on hospice at the time the blood culture resulted
- Patients with a blood culture positive for a fungus

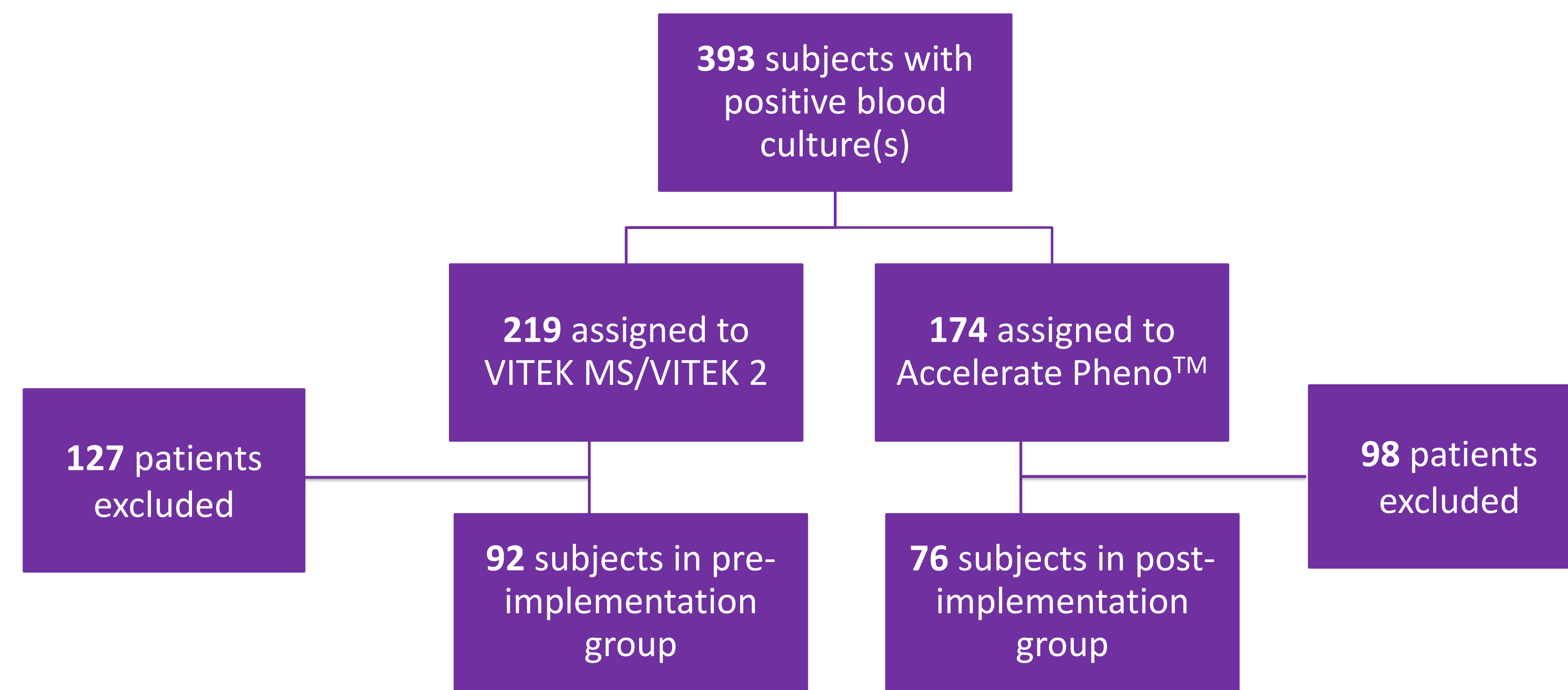
Outcomes

- Primary Outcome:**
 - Time to de-escalation of antimicrobial therapy
- Secondary Outcomes:**
 - Time from blood culture collection to organism ID
 - Time from blood culture collection to AST
 - Days of total antimicrobial therapy while hospitalized
 - Hospital length of stay
 - Mortality within 30 days

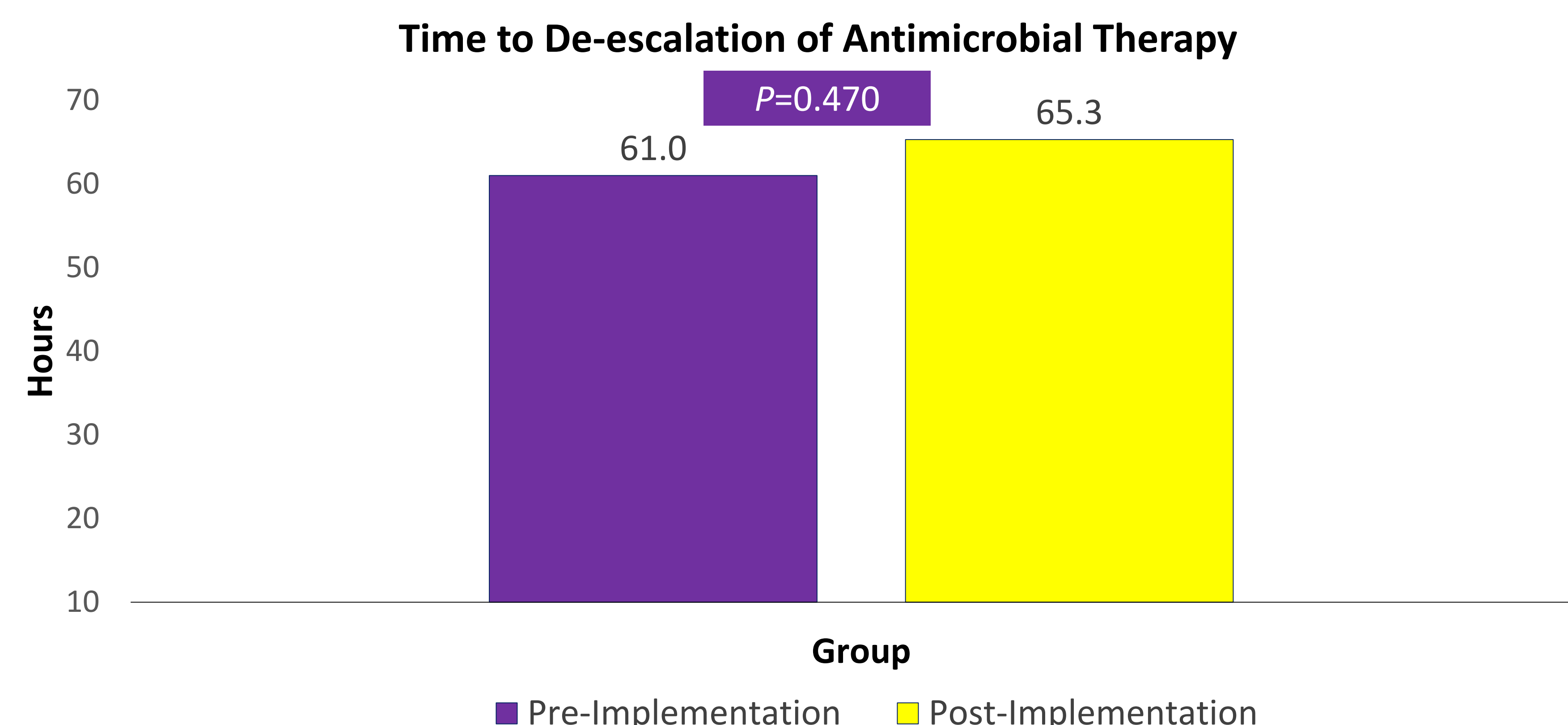
Statistical Analysis

- All variables with a p-value <0.2 in univariate analysis were included in a multivariate logistic regression model. Variables included:
 - Gram positive infection
 - Use of Accelerate Pheno™ system
 - Infectious diseases consult
 - Pharmacist antimicrobial stewardship (ASP) note(s)

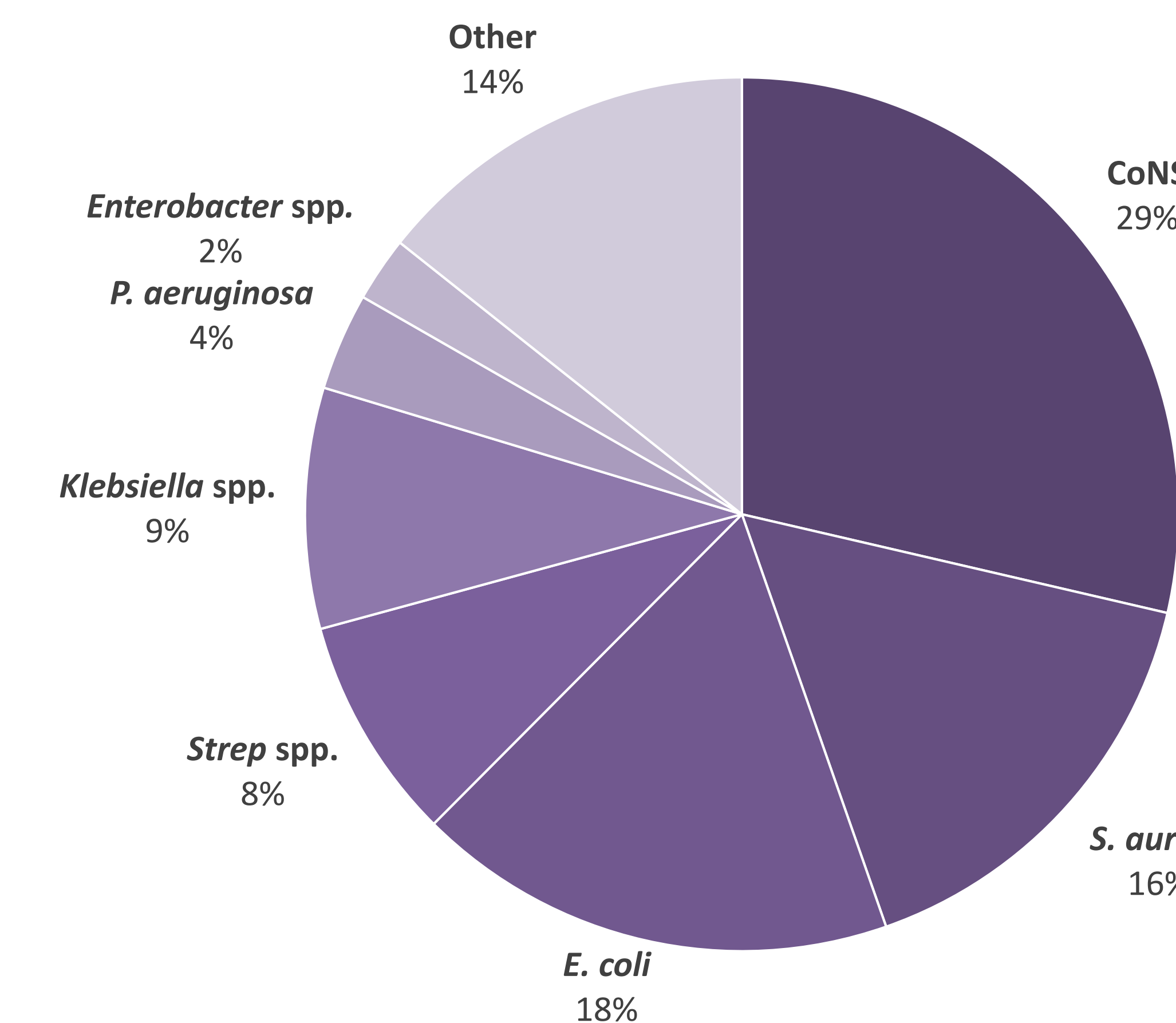
Results



Baseline Demographics and Clinical Characteristics			
Variable	Pre-Implementation (n=92)	Post-Implementation (n=76)	P-value
Male, n (%)	89 (96.7)	73 (96.1)	1.000
Age, mean years ± SD	67.4 ± 9.1	67.1 ± 9.3	0.834
Initial SCr (mg/dL), mean ± SD	1.8 ± 1.7	2.4 ± 2.3	0.042
ICU Admission, n (%)	21 (22.8)	13 (17.1)	0.358
Infectious diseases consult, n (%)	43 (46.7)	40 (52.6)	0.447
Pharmacist ASP note, n (%)	11 (12.0)	10 (13.2)	0.093



Organisms Identified



Results

Univariate Analysis			
Variable	De-escalation ≤ 48 hours (n=44)	De-escalation > 48 hours (n=103)	P-Value
Gram-positive infection, n (%)	31 (70.5)	58 (56.3)	0.108
Use of Accelerate Pheno™, n (%)	18 (40.9)	37 (35.9)	0.567
ID consult, n (%)	20 (45.5)	54 (52.4)	0.439
Pharmacist ASP note, n (%)	7 (15.9)	9 (8.7)	0.201

Multivariate Logistic Regression		
Variable	OR (95% CI)	P-value
Gram-positive infection	1.947 (0.904-4.192)	0.089
Pharmacist ASP note	2.173 (0.738-6.400)	0.159

Secondary Outcomes			
Variable	Pre-Implementation (n=92)	Post-Implementation (n=76)	P-value
Time to organism ID, mean hours ± SD	65.6 ± 46.4	50.3 ± 32.3	0.016
Time to AST, mean hours ± SD	99.0 ± 39.8	96.7 ± 28.9	0.674
Length of stay, mean days ± SD	7.8 ± 5.5	8.4 ± 7.4	0.598
30-day mortality, n (%)	11 (12.0)	7 (9.2)	0.567
<i>Clostridioides difficile</i> infection, n (%)	6 (6.5)	1 (1.3)	0.093
Acute kidney injury, n (%)	9 (9.8)	10 (13.2)	0.492

Conclusions

- The Accelerate Pheno™ system did not impact time to de-escalation of antimicrobial therapy.
- Future antimicrobial stewardship interventions may target:
 - Educating clinical pharmacy specialists and other healthcare providers on the Accelerate Pheno™ system
 - Identifying methods to improve timely communication of test results to healthcare providers

References

- Dare RK, Lusardi K, Pearson C, et al. Clinical Impact of Accelerate Pheno™ Rapid Blood Culture Detection System in Bacteremic Patients. *Clin Infect Dis.* 2020; ciaa649. [Epub ahead of print].
- Banerjee R, Komarow K, Virk A, et al. Randomized trial evaluating clinical impact of RAPid IDentification and Susceptibility testing for Gram Negative bacteremia (RAPIDS-GN). *Clin Infect Dis.* 2020; ciaa528. [Epub ahead of print].

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