



Impact of an Infectious Diseases Consult on *Staphylococcus aureus* Bacteremia Management

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Background

- Staphylococcus aureus* is a leading cause of infection in hospitalized patients and represents a significant burden on the healthcare system
- Staphylococcus aureus* bacteremia (SAB), in particular, is associated with high rates of morbidity and mortality, as well as complications such as:
 - Infective endocarditis
 - Vertebral osteomyelitis
 - Recurrent bacteremia
- Optimal management of SAB involves performing several key elements including:
 - repeat blood cultures, removal of infectious foci, echocardiography, and appropriate empiric and definitive antimicrobial therapy, in accordance with published guidelines
- Several studies have shown a positive impact of infectious diseases (ID) consultation on SAB management, both in meeting standard of care metrics as well as clinical outcomes, including mortality
- In 2014, the antimicrobial stewardship program (ASP) at our institution implemented a laboratory-driven automatic ID consultation for any patient with SAB

Methods

Study Population

This retrospective cohort study included all inpatients treated for their first documented SAB at the University of Toledo Medical Center between January 1, 2010 and July 31, 2015 and met the following criteria:

Inclusion Criteria	Exclusion Criteria
<ul style="list-style-type: none"> Confirmed blood culture positive for <i>S. aureus</i> identified from the Vitek2™ instrument database Admitted to a hospital inpatient care unit at the time of isolation of <i>S. aureus</i> Treated with antimicrobial therapy 	<ul style="list-style-type: none"> Expired within two days of blood specimen collection Admitted to hospice or palliative care during treatment for SAB Recurrent SAB identified after the first documented and treated isolate within the study period Polymicrobial bloodstream infection

Intervention

Patients meeting inclusion criteria were divided into two groups:

- Infectious diseases consult (ID Consult)
 - At least 1 history and physical or daily progress note signed by an infectious diseases physician within the patients' medical record
- No infectious diseases consult (No-ID Consult)

Primary Endpoint

Overall adherence to the infectious diseases bundle:

- Repeat blood cultures within 48-96 hours of first positive blood culture for *S. aureus*
- Obtaining a TTE or TEE to detect infective endocarditis
- Source identification and source control of infectious foci
- Appropriate empiric and definitive antibiotic therapy depending on sensitivity of *S. aureus* isolate
- Appropriate length of antibiotic therapy for uncomplicated versus complicated bacteremia

Secondary Endpoints

Adherence to each individual bundle component, 30-day readmission, 30-day all-cause mortality

Analysis

Categorical variables were compared via χ^2 test. Continuous variables were compared via Student's t test or Mann-Whitney, as appropriate. A $p < 0.05$ was considered statistically significant for all comparisons.

Disclosures: The authors have nothing to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter

Results

Figure 1. Intervention inclusion and exclusion criteria

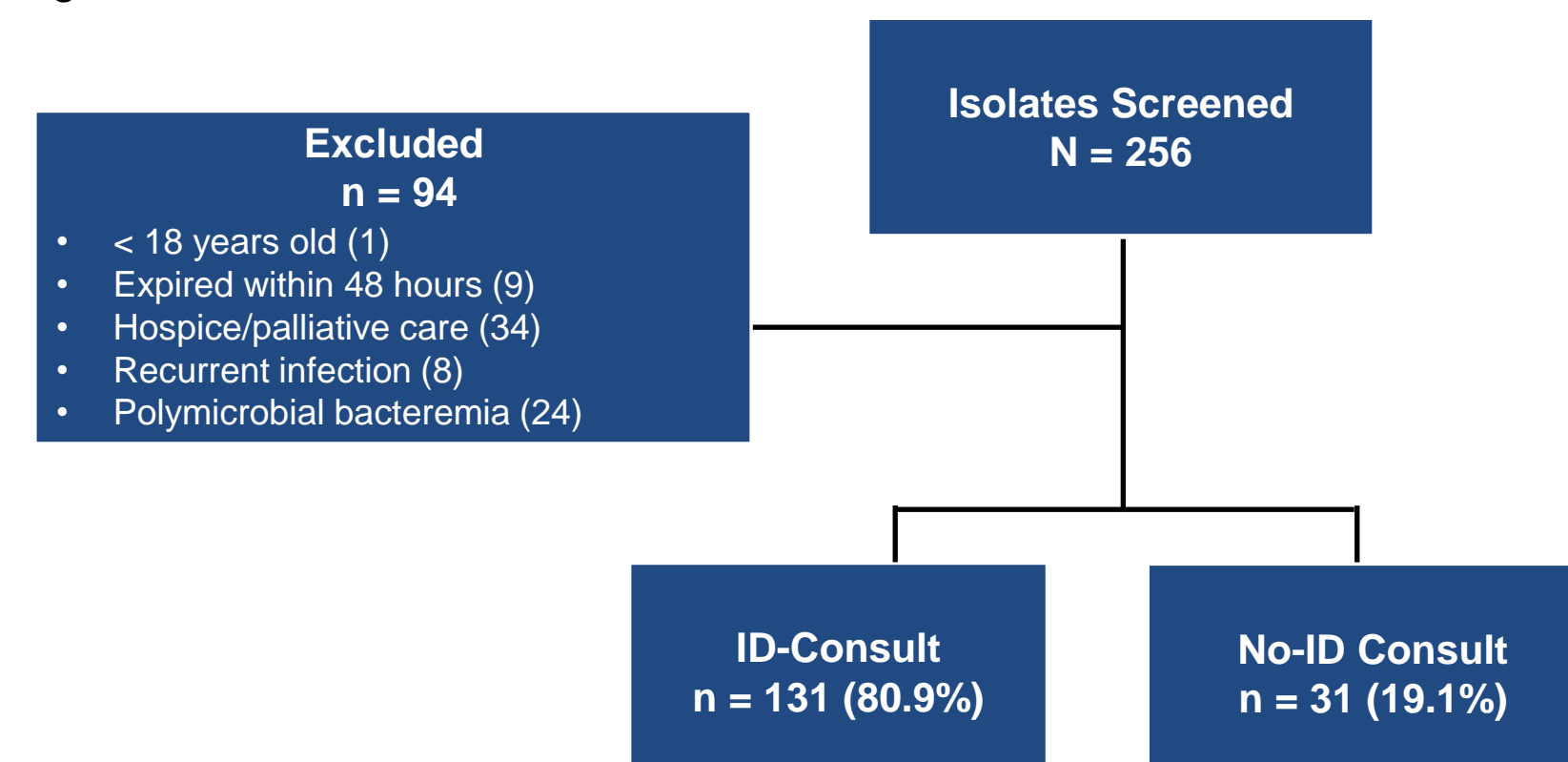


Table 1. Baseline Characteristics

	ID-Consult (n = 131)	No-ID Consult (n = 31)	P-Value
Age, in years	57 (43-66)	61 (51-70)	0.190
Male Gender	75 (57.3)	15 (48)	0.372
MRSA Isolate	53 (40.5)	16 (48.4)	0.421

Data shown as median (IQR) or n (%)

Figure 2. Consultation Rate and Admitting Service

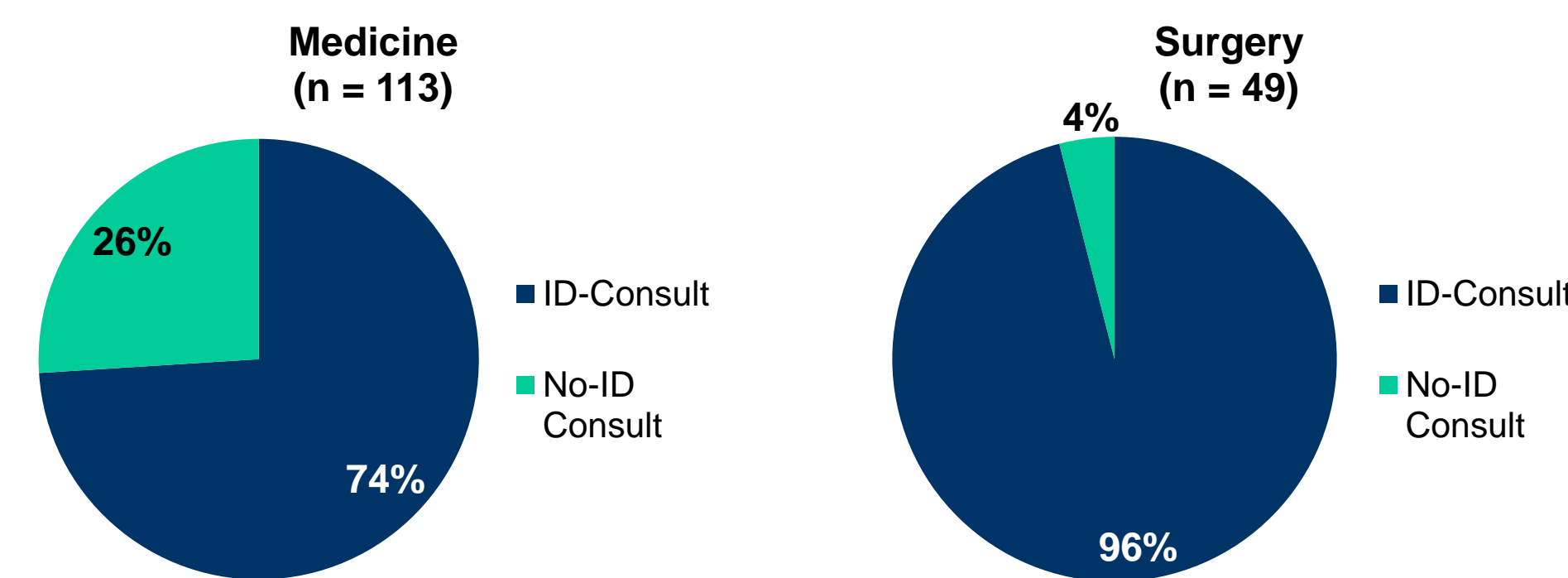
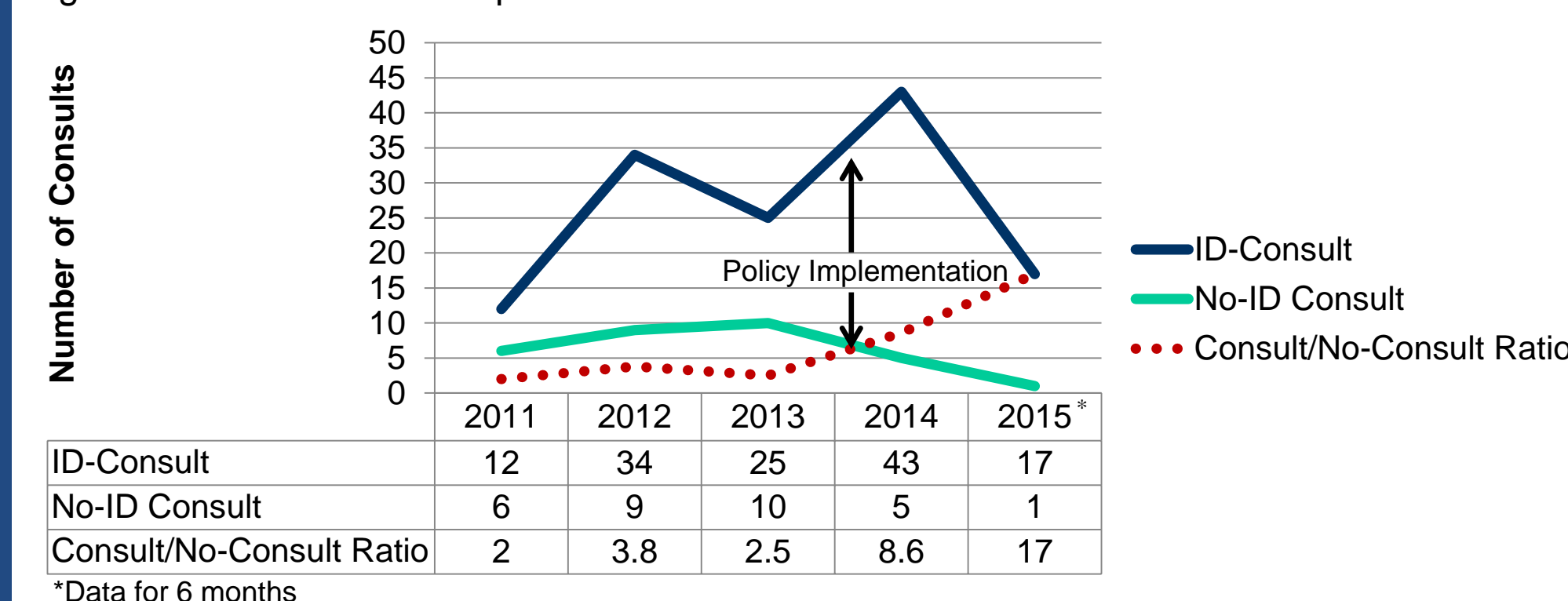


Figure 3. Consultation Rate per Year



Results

Figure 4. Primary Endpoint: Bundle Adherence

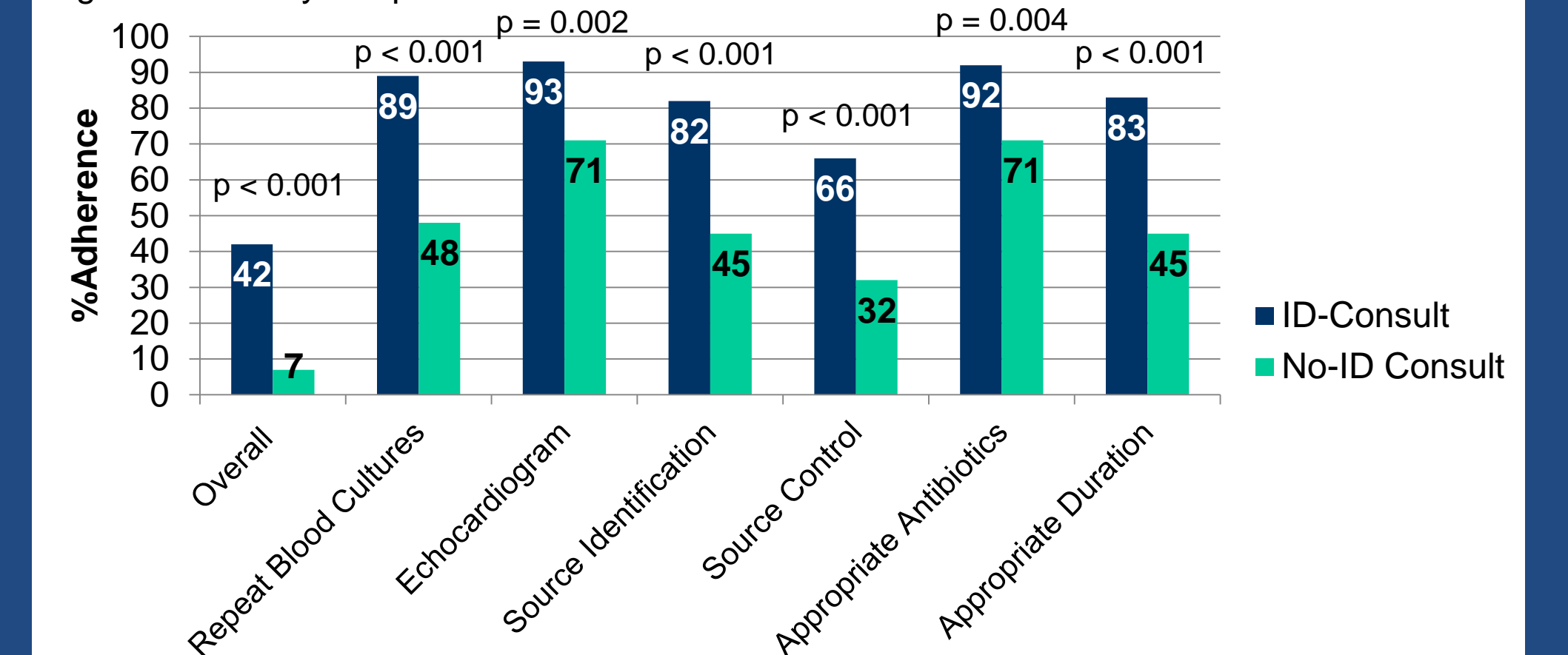
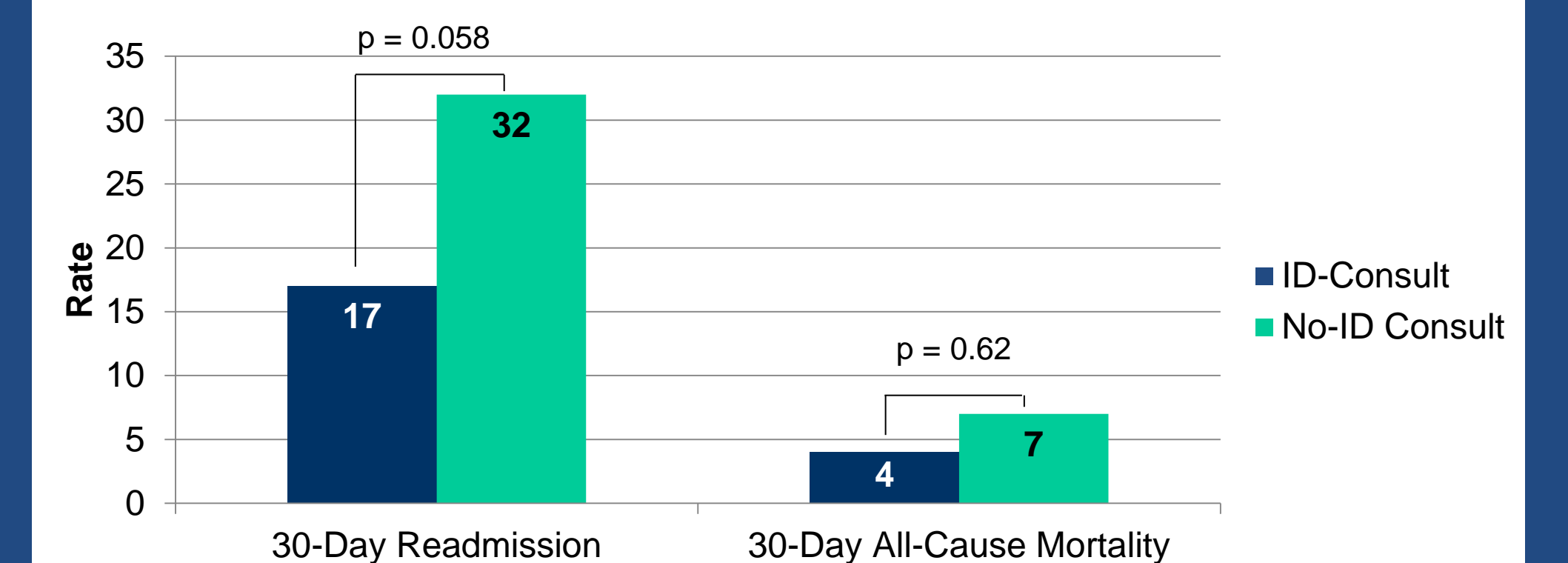


Figure 5. Secondary Endpoints: Clinical Outcomes



Conclusions and Future Directions

- Infectious diseases consultation was associated with a significantly greater rate of adherence to recommended standards of care in the management of *Staphylococcus aureus* bacteremia at our institution
- Although not statistically significant, patients with infectious diseases consultation also had clinically significantly lower rates of 30-day readmission and 30-day all-cause mortality
- Prior to implementation of the lab-driven consultation policy, infectious diseases physicians were already consulted in a majority of cases of SAB, therefore, the increase in consultation rate has not posed a significant burden on the infectious diseases consult service
- The combined improvement in both clinical and quality outcomes validates the importance of this antimicrobial stewardship intervention at our institution and lends itself as a potential model to improve the management of other infectious disease states including *Clostridium difficile*-associated diarrhea (CDAD) and outpatient parenteral antimicrobial therapy (OPAT)

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