

Shifting Antimicrobial Practice to Minimize Length of Stay in Orthopedic Infections: Analysis from an Academic Tertiary Care Center

Rebecca A. Stern, MD, Jeffrey A. Freiberg, MD, PhD, Paul Y. Wada, MD, Jennifer Cihlar, DO, Kevin M. Gibas, MD, Patty W. Wright, MD, Richard W. LaRue, MD, Milner Staub, MD, MPH
Vanderbilt University Medical Center, Nashville, TN

Contact Information:
Rebecca Stern, MD
A-2209 Medical Center North
1161 21st Ave. S.
Nashville, TN 37232
Phone: (615) 322-2035
Fax: (615) 343-6160
Email: Rebecca.stern@vumc.org

Introduction

- Prolonged length of stay (LOS) for hospitalization for orthopedic infections (HOI) is associated with increased risks of readmission, hospital acquired infections, mortality, and cost.
- The impact of ID consultation on LOS for HOI is unclear.
- Potential factors affecting LOS for HOI include pending culture data, route of antimicrobial administration on discharge (IV vs. PO), and logistics of peripherally inserted central catheter (PICC) placement

Aims

- Evaluate if duration and end of ID consultation (time to final recommendations) were associated with increased LOS among HOI
- Identify process improvements for an ID consult to expedite discharge among HOI

Methods

- Retrospective chart review of HOIs with ID consultation from May-August 2021

Inclusion Criteria	Exclusion Criteria
Native or prosthetic joint infection: osteomyelitis, tenosynovitis, hardware-associated, surgical site infection within 30 days following orthopedic surgery or 90 days if hardware present	<ul style="list-style-type: none">Primary infection not orthopedic-relatedBloodstream infectionInfection involving vertebrae or sacrum
<ul style="list-style-type: none">Differences in HOIs discharged ≤ 1 vs. >1 day after ID final recommendations examined using Fisher's exact, Chi-squared and Wilcoxon rank sum testing<ul style="list-style-type: none">Clustering by patient for those with >1 admission	

Results

Table 1: Patient and Care Factors Affecting Length of Stay for Orthopedic-Infection Admissions

Factor Affecting Length of Stay (LOS)	All Patients (N=104)	Discharged >1 day after ID Final Recommendations (N=36)	Discharged ≤ 1 day after ID Final Recommendations (N=68)	P value
LOS after ID final recommendations (median, [IQR])	1 day [0-3]	5 days [3-9.25]	1 day [0-1]	n/a
Total LOS (median, [IQR])	4 days [3-7]	8 days [6-16.25]	3 days [2-4]	<0.0001
Days followed by ID (median, [IQR])	3 days [2-4]	3 days [2-4]	3 days [2-4]	0.190
Number of surgeries during hospitalization	0: 18 (17.1%) 1: 69 (65.7%) >1 : 18 (17.1%)	0: 2 (5.6%) 1: 24 (66.7%) >1 : 10 (27.8%)	0: 16 (23.5%) 1: 44 (64.7%) >1 : 8 (11.8%)	0.019
Antibiotics in 14 days prior to surgery (among patients undergoing surgery)	54.0% (47/87)	58.8% (20/34)	51.9% (27/52)	0.658
Intra-operative surgical cultures sent to micro (among patients undergoing surgery)	92.0% (80/87)	88.2% (30/34)	94.2% (49/52)	0.427
Any culture positive (among patients with any culture obtained)	67.3% (66/98)	65.7% (23/35)	67.7% (42/62)	>0.999
Antibiotics on discharge (IV includes patients who received a combination of IV and oral antibiotics)	None: 10 (9.5%) Oral: 34 (32.4%) IV: 61 (58.1%)	None: 7 (19.4%) Oral: 6 (16.7%) IV: 23 (63.9%)	None: 2 (2.9%) Oral: 28 (41.2%) IV: 38 (55.9%)	0.003
PICC placed during admission	54 (51.9%)	25 (69%)	29 (42.6%)	0.013
Discharge location (Home vs Facility)	Home: 82 (78.1%) Facility: 23 (21.9%)	Home: 19 (52.8%) Facility: 17 (47.2%)	Home: 62 (91.2%) Facility: 23 (8.8%)	<0.0001

IQR; Interquartile range; PICC: peripherally inserted central catheter

Results

Figure 1: Total Length of Stay

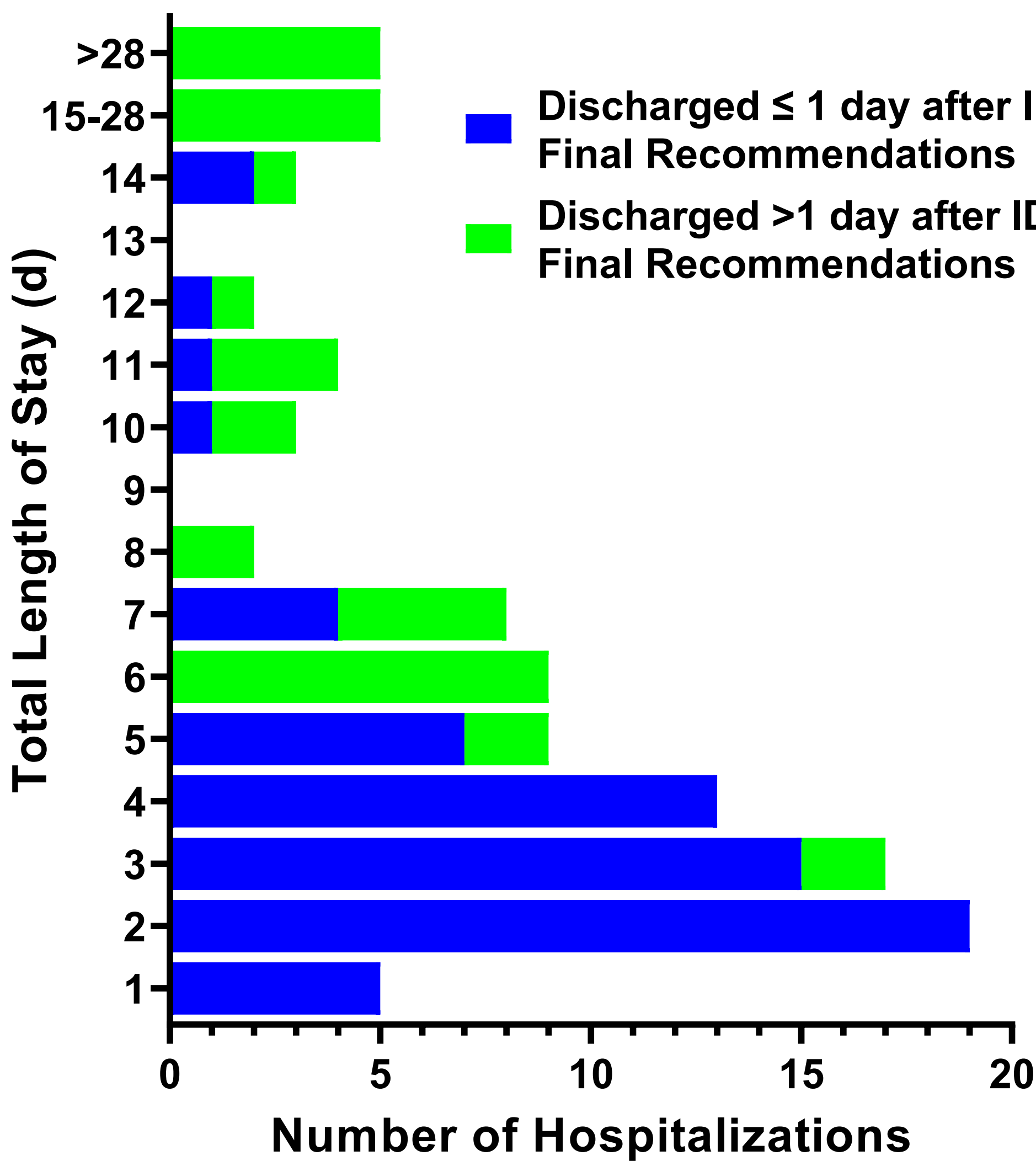
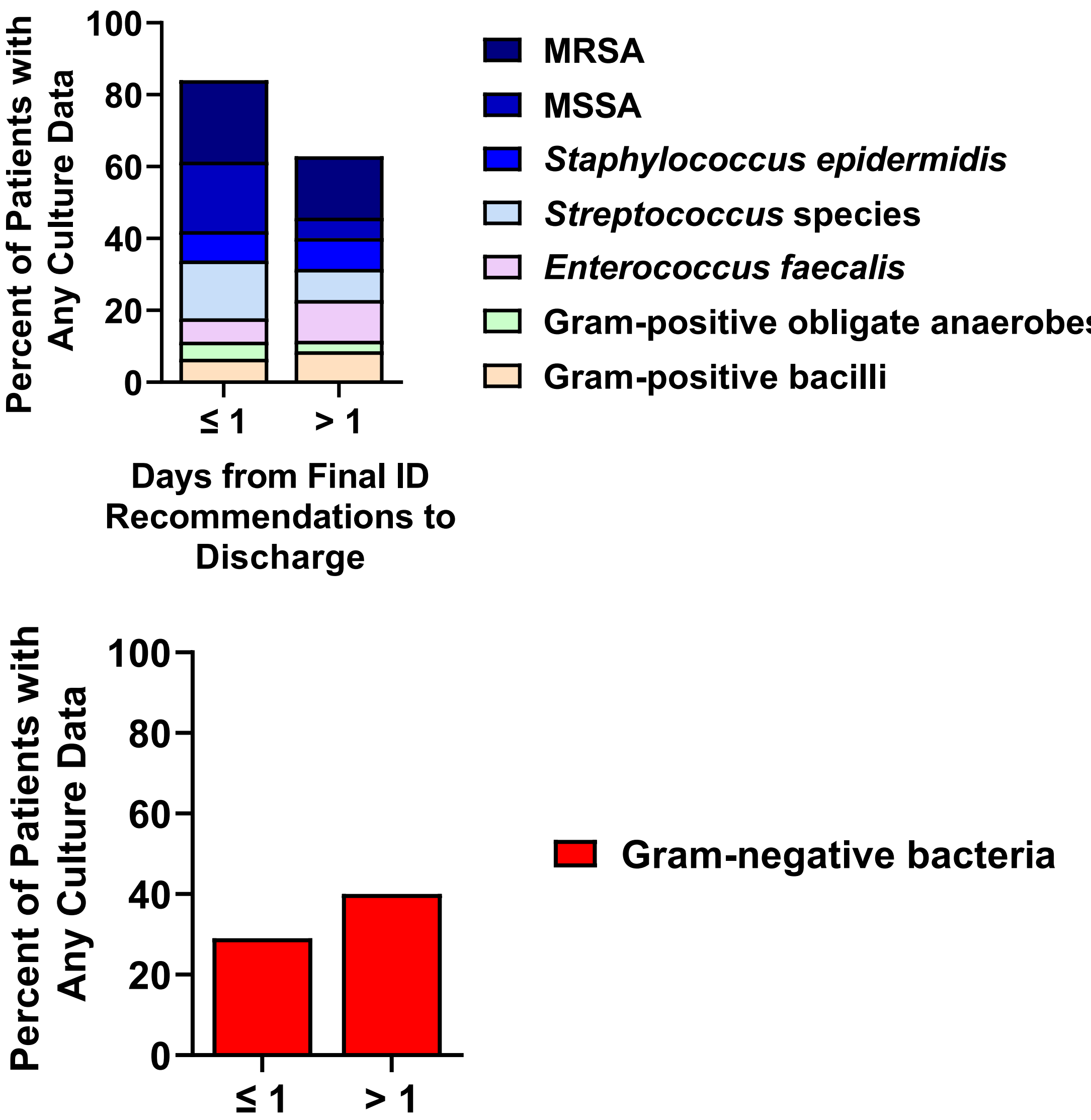


Figure 2: Culture-Positive Results of Patients with Orthopedic-Infection Admissions



Post-Hospitalization Outcomes

No significant difference between patients who discharged ≤ 1 or >1 day after ID final recommendations for 30-day readmission rate, all-cause mortality, OPAT complications, or rate of ID clinical follow-up.

Patients who discharged ≤ 1 day after ID final recommendations had significantly shorter LOS, more oral-only antibiotic regimens upon discharge, and were more likely to discharge home.

Conclusions

- ID consultation is unlikely the primary barrier to hospital discharge among HOIs, though may signal more complex HOIs and increased LOS
- The majority of patients with prolonged LOS discharged >1 day after ID final recommendations
- Factors independent of infection (e.g. insurance, disposition to a facility, PICC placement) likely play a larger role
- Process improvements to expedite transitions of care and discharges should include protocols for prompt ID consultation, PICC placement, coordination of OPAT, and consideration of protocols to encourage PO over IV therapy

References

For questions, to discuss further, or for a list of references that informed this poster, please email.