

Evaluating the Prevalence of Follow-up on Post-discharge Positive Bacterial Results from Sterile Site Cultures and the Impact on Infection-related Complications

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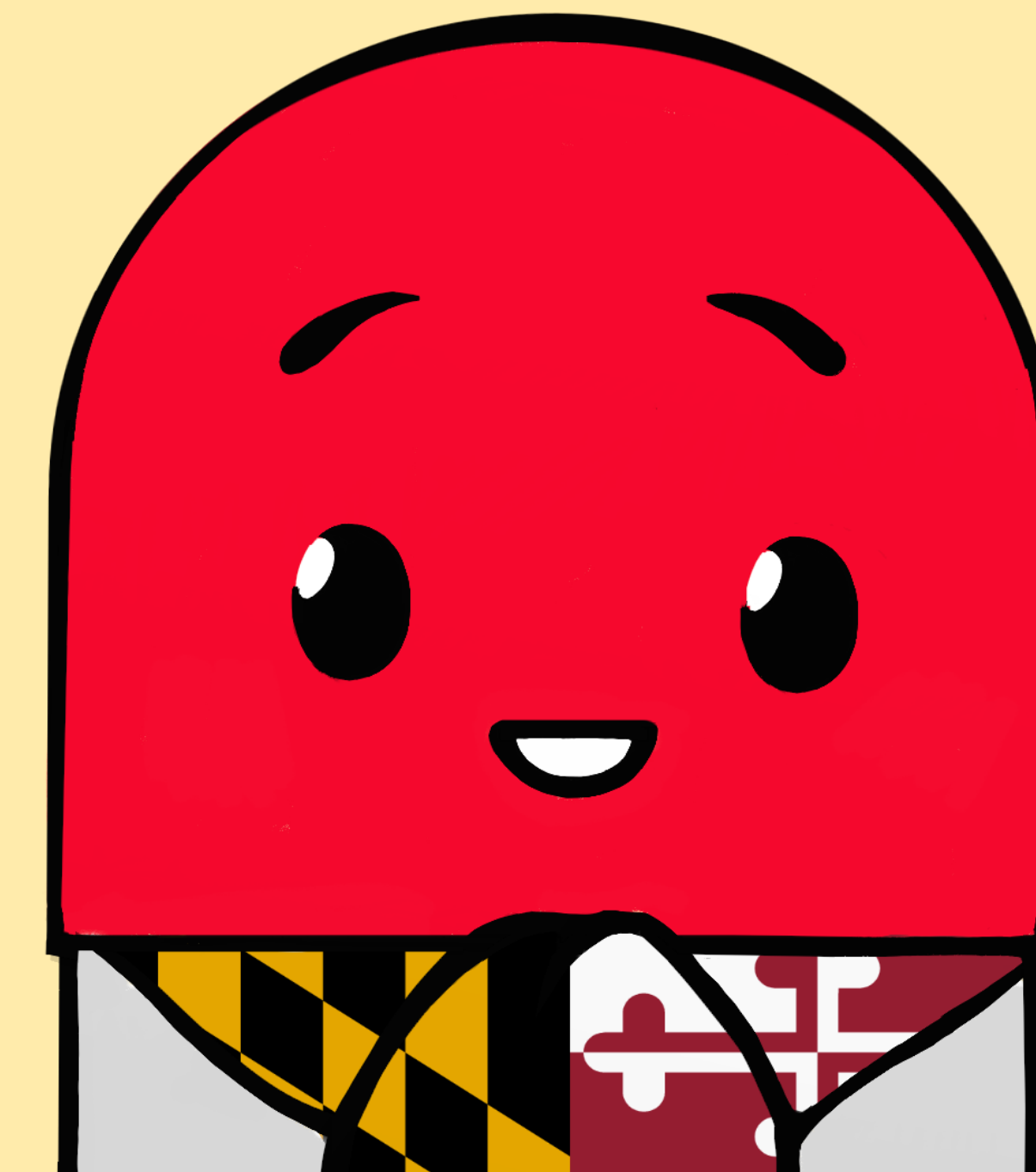


BACKGROUND

- Numerous patients have cultures pending at discharge that if not addressed may delay diagnosis and initiation of appropriate antimicrobials
 - Approximately 41% of patients in the United States have microbiology cultures pending at hospital discharge
- Unfortunately, many U.S. medical systems do not currently have a clear responsible party to follow-up these pending results
 - This obstacle surrounding transitions of care often hinders communication of positive microbiology results, potentially leading to significant delays in diagnosis, initiation of appropriate antimicrobial therapy, and outpatient follow-up
 - These system failures have been theorized to lead to increases in potential patient harm, antimicrobial resistance, and hospital readmissions
- The purpose of the study is to evaluate appropriateness of antimicrobial therapy and result documentation in patients with positive cultures finalized post-discharge

STUDY DESIGN & METHODS

- Retrospective cross-sectional cohort study at University of Maryland Medical Center (UMMC)
- Adult patients admitted for ≥48 hours with positive sterile site cultures that finalized post-discharge from 7/1/2019 to 12/31/2019
- Primary outcome:** determine the prevalence of patients with post-discharge positive sterile-site cultures warranting antimicrobial therapy intervention
 - Warranting intervention was defined by whether a discharge antimicrobial plan required escalation or de-escalation based on finalized culture results
 - Antimicrobial escalation or de-escalation was determined if results indicated an antimicrobial therapy mismatch or antimicrobial spectrum being exceedingly broad for the finalized organism
- Secondary outcomes:** evaluating the prevalence and timeliness of documentation of culture acknowledgement and/or intervention; comparison of 30-day hospital readmission among those warranting intervention versus those who did not
 - Prevalence of documentation of culture finalization was defined as the quantity of cultures with documentation within the electronic medical record (EMR)
 - Timeliness was measured in calendar days as the difference between time of culture acknowledgement documentation and time of culture finalization.
- Statistical analysis:
 - Bivariate analysis used for comparisons including X² or Fisher's Exact (FE) Test for nominal variables; Student t-test or Mann Whitney U test for continuous variables
 - Multivariable logistical regression analysis was used to find independent predictors and potential confounding of 30-day hospital readmission



Take-home Points:

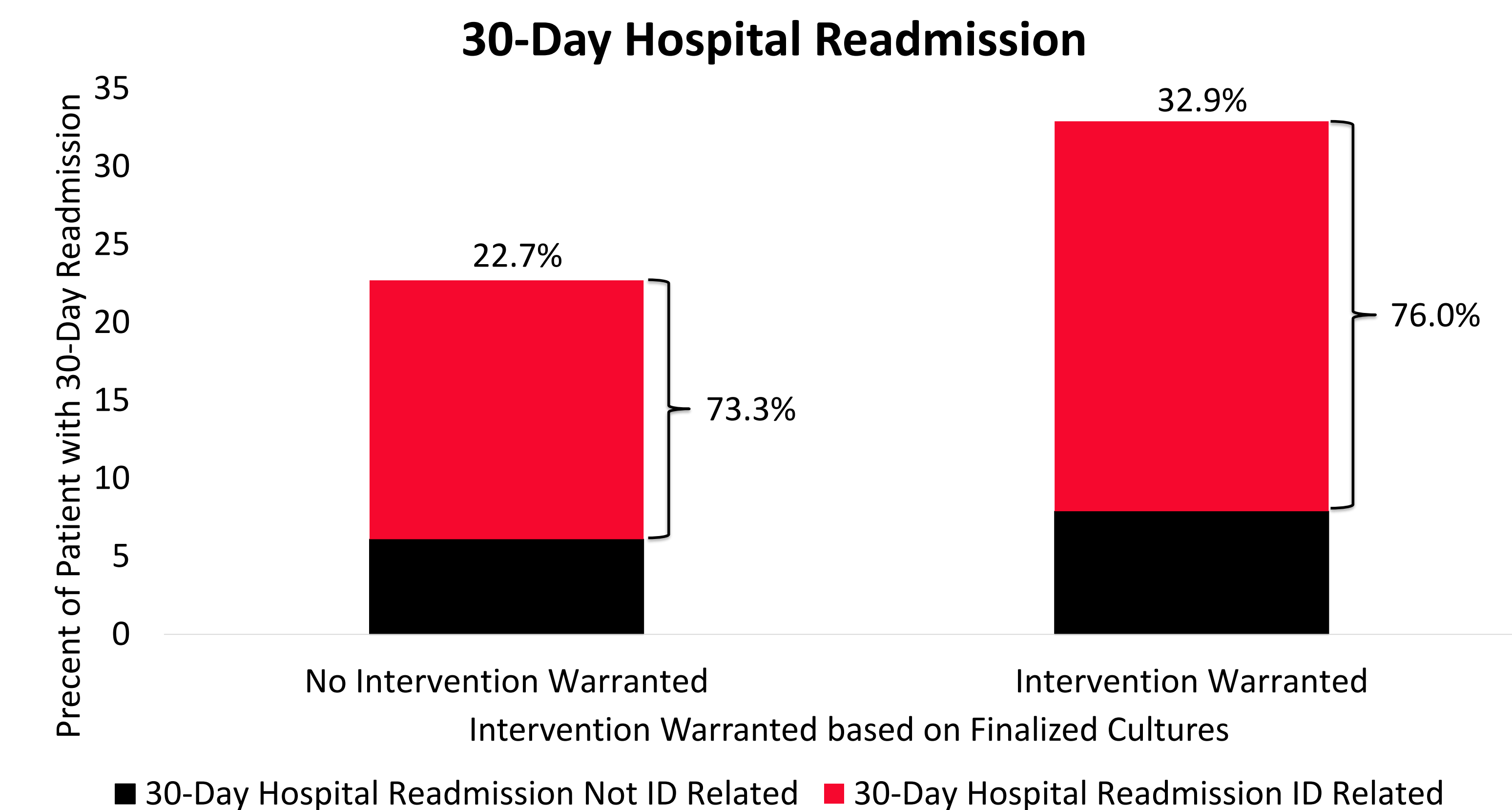
A significant number of patients with cultures finalized post-discharge warranted antimicrobial intervention. Acknowledgment of final culture data may decrease the risk of 30-day hospital readmission.

RESULTS

Baseline Demographics and Clinical Characteristics

	Overall (n=208)	No Intervention Warranted (n=132)	Intervention Warranted (n=76)	P-Value
Age (years)	51 (37-63)	51 (36.3-62)	51 (38.3-64.8)	0.65
Male, n (%)	117 (56.2)	71 (53.8)	46 (60.5)	0.35
Discharging Service, n (%)				
Medicine	90 (43.3)	58 (43.9)	32 (42.1)	0.8
Surgical	95 (45.7)	62 (47)	33 (43.4)	0.62
Trauma	23 (11)	12 (9.1)	11 (14.5)	0.23
Culture Site, n (%)				
Blood	61 (29.3)	45 (34.1)	16 (21.1)	0.047
Bone/joint fluid	32 (15.4)	20 (15.2)	12 (15.8)	0.902
Cardiac	5 (2.4)	4 (3.0)	1 (1.3)	0.397
GI abscess	21 (10.1)	9 (6.8)	12 (15.8)	0.039
Dental abscess	16 (7.7)	14 (10.6)	2 (2.6)	0.038
OR/tissue/deep wound culture	61 (29.3)	33 (25.0)	28 (36.8)	0.071
Other	12 (5.8)	7 (5.3)	5 (6.6)	0.704
Organism, n (%)				
Gram-positive	124 (59.6)	93 (70.5)	31 (40.8)	<0.001
Gram-negative	49 (23.5)	25 (18.9)	24 (31.6)	0.04
Fungal	22 (10.6)	11 (8.3)	11 (14.5)	0.17
Polymicrobial	12 (5.8)	3 (2.3)	9 (11.8)	0.006
Other	1 (0.5)	0 (0)	1 (1.3)	0.36
Antimicrobials Prescribed, n (%)				
Intravenous	34 (16.3)	24 (18.2)	10 (13.2)	0.345
Oral	111 (53.4)	78 (59.1)	33 (43.4)	0.029
None	63 (30.3)	30 (22.7)	33 (43.4)	0.002
Length of Stay (days)	4 (2.0-9.0)	4 (3.0-8.0)	4 (2.0-9.0)	0.95

- Patients with antimicrobial therapy warranting intervention due to finalization of cultures occurred in 76 (36.5%) patients
- Among patients warranting intervention:
 - 62 (81.6%) warranted escalation of antimicrobial therapy
 - 13 (17.1%) warranted de-escalation of antimicrobial therapy
 - 1 (1.3%) warranted both de-escalation and escalation
- Rates of result acknowledgement documentation were overall low (35.5%)
- Inpatient ID team involvement did not statistically significantly impact warranting intervention on post-discharge cultures (53.8% vs. 47.4%, P = 0.372)
- Documentation of results acknowledgement was completed more frequently in patients that warranted intervention (47.4% vs. 28.8%, P = 0.007) and time to documentation was notably shorter in this group as well (4 days vs. 9 days, P=0.04)



Multivariable Logistical Regression of 30-day Hospital Readmission

Covariate	Unadjusted Odds Ratio	95% Confidence Interval	Adjusted Odds Ratio	95% Confidence Interval
ID Team Involvement				
Documentation of Result	0.52	(0.22-1.21)	--	--
Intervention Warranted	0.42	(0.18-1.01)	0.41	(0.18-1.01)
Bacteremia	1.3	(0.51-3.12)	--	--
No ID Team Involvement				
Documentation of Result	0.52	(0.22-1.3)	0.19	(0.07-0.53)
Intervention Warranted	0.86	(0.35-2.13)	--	--
Bacteremia	0.95	(0.35-2.58)	--	--

References:

Hanna D et al. *Jt Comm J Qual Patient Safe.* 2005;31:68-80; Sherman H et al. *Int J Qual Health Care.* 2009;21:2-8; Roy CL et al. *Ann Intern Med.* 2005;143:121-9; El-Kareh et al. *J Hosp Med.* 2011;6:291-6; El-Kareh et al. *J Gen Intern Med.* 2012;27:1243-50.