Evaluation of Gram-positive Blood Culture Management in Patients Treated and Discharged from the Emergency Department: A Retrospective Analysis

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Background

- Conventional laboratory blood culture methods typically identify organisms and their antimicrobial susceptibilities in 48 to 72 hours.
- Patients who are treated in and discharged from the emergency department (ED) may have to return for positive blood cultures that resulted after discharge.
- Patients with contaminated blood cultures that are called back to the ED can be unnecessarily exposed to the healthcare setting.
- This study characterizes the frequency in which patients with contaminated blood cultures return to the ED, and quantifies unnecessary exposure to the healthcare setting that occurs with conventional methods.

Methods

- Retrospective review of patients with positive blood cultures following ED discharge between January 1st, 2019 and December 31st, 2019
- Inclusion Criteria: Patients aged 25 years or older with gram-positive cocci (GPCs) detected in at least one blood culture bottle after ED discharge
- Exclusion Criteria: Pregnant patients
- Primary outcome: ED readmissions due to blood cultures that were deemed contaminants upon final identification
- Secondary outcomes: Antimicrobial exposure and ED length of stay

Results

- Of the 51 patients included, 37 (71.2%) had GPCs in blood cultures that were considered contaminants per clinical chart review.
- Of the 37 patients with contaminated blood cultures, 30 (81%) were contacted to return to the ED.
- Of the 30 patients contacted, 20 (66.6%) returned to the ED.
- Patients that were brought back to the ED due to contaminated blood cultures stayed for an average of 57.6 hours (median = 48 hours).
- Of the 20 patients brought back to the ED, 13 (65%) were given unnecessary antibiotics.
- The average time of antibiotic exposure was 49.2 hours (SD = 33.6 hours).
- Vancomycin was the most common antibiotic given, either alone (n=8, 40%) or in combination with piperacillin/tazobactam (n=3, 15%).

Discussion

- Providers commonly call patients back to the ED after discharge due to GPC bacteremia, regardless of their clinical presentation.
- Patients are exposed to the hospital setting and administered unnecessary antibiotics throughout the time it takes for blood cultures to identify likely contaminants.

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Patients with contaminated blood cultures that are treated and discharged from the emergency department **are unnecessarily exposed to the hospital and antibiotics** throughout the time it takes for organism identification.

Supplementary Data

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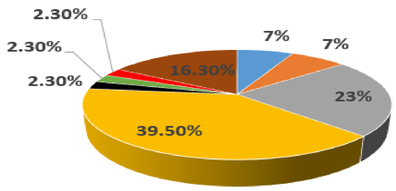
Table 1: Baseline Demographics

Demographics	Value (n = 51)
Age in years, mean (SD)	56 (17)
Female gender (%)	28 (55)
Most Common Chief Complaints	**Value n(%)**
Respiratory Distress	19 (37)
Fever/Chills	5 (10)
Altered Mental Status	4 (8)
Most Common Discharge Diagnoses	**Value n(%)**
Asthma/COPD Exacerbation	7 (14)
Community-Acquired Pneumonia	5 (10)
Skin and Soft Tissue Infection	5 (10)

Table 2a and 2b: Blood Culture Results

2a) Blood Culture growth in patients that were contacted (n = 30)



2b) Blood Culture growth in patients that were not contacted (n = 7)

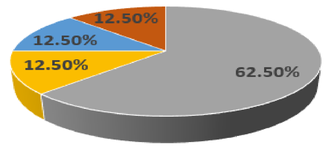


Table 3: Blood Culture Timing compared to Average Length of Stay

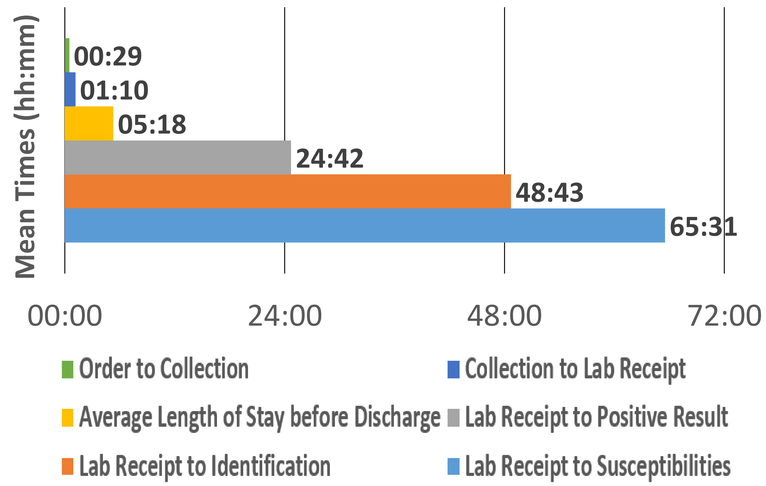


Table 4: Management of Contaminated Blood Cultures

Patients Contacted to Return to the Emergency Department	Value (n=30)
Returned after Discharge (%)	20 (66)
Length of Stay after Return in hours, mean (median)	57.6 (48)
Patients Exposed to Antibiotics after Readmission	**Value (n=13)**
Duration of Antibiotic Exposure in hours, mean (SD)	49.7 (33.6)