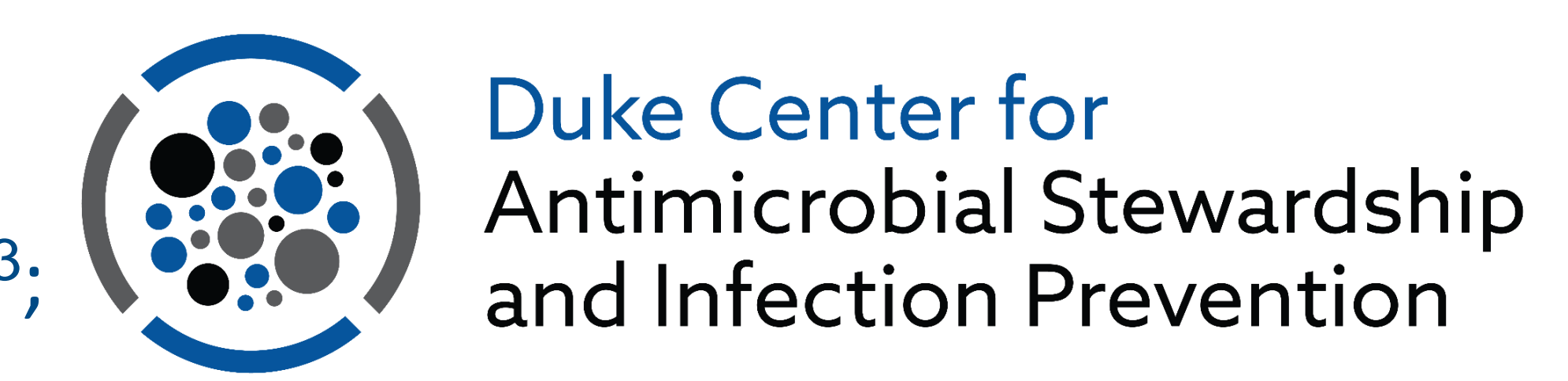


Impact of an Algorithm to Triage Patients Discharged from the Emergency Department with Blood Cultures Positive for *Staphylococcus aureus* or Coagulase-negative Staphylococcus

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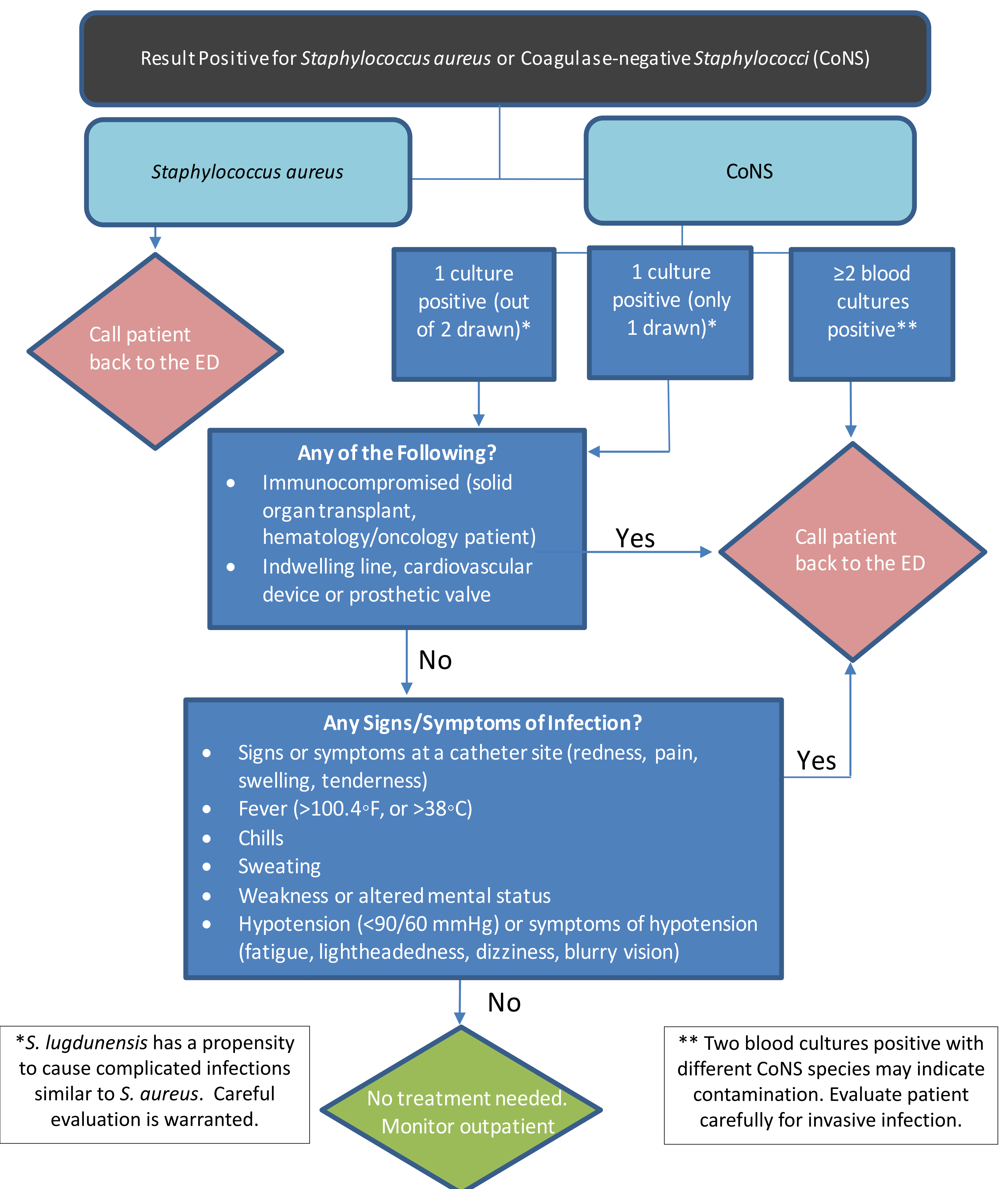
Background

- Duke University Health System (DUHS) Emergency Department (ED) staff review positive blood cultures in patients discharged prior to results.
- Assessing which cases should return to the ED or can safely stay outpatient can be challenging.
- Calling patients back to the ED for contaminated cultures may cause undue burden on both EDs and patients.
- We developed an evidence-based algorithm to assist in interpreting positive blood cultures growing staphylococci in patients discharged from the ED.

Methods

- Multi-center, retrospective cohort study
- Population:** adult patients discharged from DUHS EDs between January 2019 - May 2022 with one or both positive blood cultures with staphylococci resulting after discharge.
- Exclusion criteria:** Polymicrobial blood cultures (non-Staphylococcal species); patient death, return to ED, or admission prior to culture results; pregnant patients
- Primary objective:** Compare the actual rate of callback to the ED versus the rate if the algorithm had been used
- Secondary objectives:** 30- and 60-day staphylococcal infection-related readmission and mortality rates
- Statistics:** Asymptotic McNemar's test compared the paired binomial proportions. Newcombe square-and-add approach estimated the difference in the rates with 95% confidence intervals.

Methods (Callback Algorithm)



Results (Population Characteristics)

Characteristic	Total Patients (N = 188)
Age (years), median (Q1, Q3)	59.3 (45.0, 72.1)
Intravascular Prosthetic Material Present, n (%)	31 (16.5)
Immunocompromising Condition, n (%)	22 (11.7)
Infectious Symptoms when contacted by ED, n/number called (%)	58/153 (37.9)
Number of Index Cultures Drawn, median (Q1, Q3)	2 (2, 2)
Number of Index Cultures with Growth, n (%)	
1	154 (81.9)
2	34 (18.1)
Species identified, n (%)	
CoNS (Not <i>S. lugdunensis</i>)	154 (81.9)
<i>S. lugdunensis</i>	0 (0.0)
<i>S. aureus</i>	36 (19.1)
Methicillin-Resistant <i>S. aureus</i>	14 (7.4)
Methicillin-Susceptible <i>S. aureus</i>	23 (12.2)

Results (Actual versus Algorithm Guided Callback Rates)

Comparative Outcomes, n/n (%)	Actual	Algorithm Guided	Difference in rates	Newcombe 95% CI	P-Value
Rate of patients advised to return to ED	115/188 (61.2%)	86/188 (45.7%)	29/188 (15.4%)	(9.8%, 20.9%)	<0.001
Rate of patients with <i>S. aureus</i> advised to return to ED	32/36 (88.9%)	36/36 (100%)	-4/36 (-11.1%)		
Rate of patients with CoNS advised to return to ED	85/154 (55.2%)	52/154 (33.8%)	33/154 (21.4%)	(14.9%, 27.6%)	
Rate of concordance to the algorithm for all patients	129/188 (68.6%)		-59/188 (-31.3%)		

Conclusions

- Algorithm-guided interpretation of blood cultures growing staphylococci could significantly reduce the overall rate of callback to DUHS EDs by approximately 15%, while also calling back patients with true infections who might be missed, in accordance with best evidence-based practice.
- Zero patients who were identified as growing contaminants by the algorithm had a confirmed 60-day staphylococcal infection-related readmission or death (data not shown).