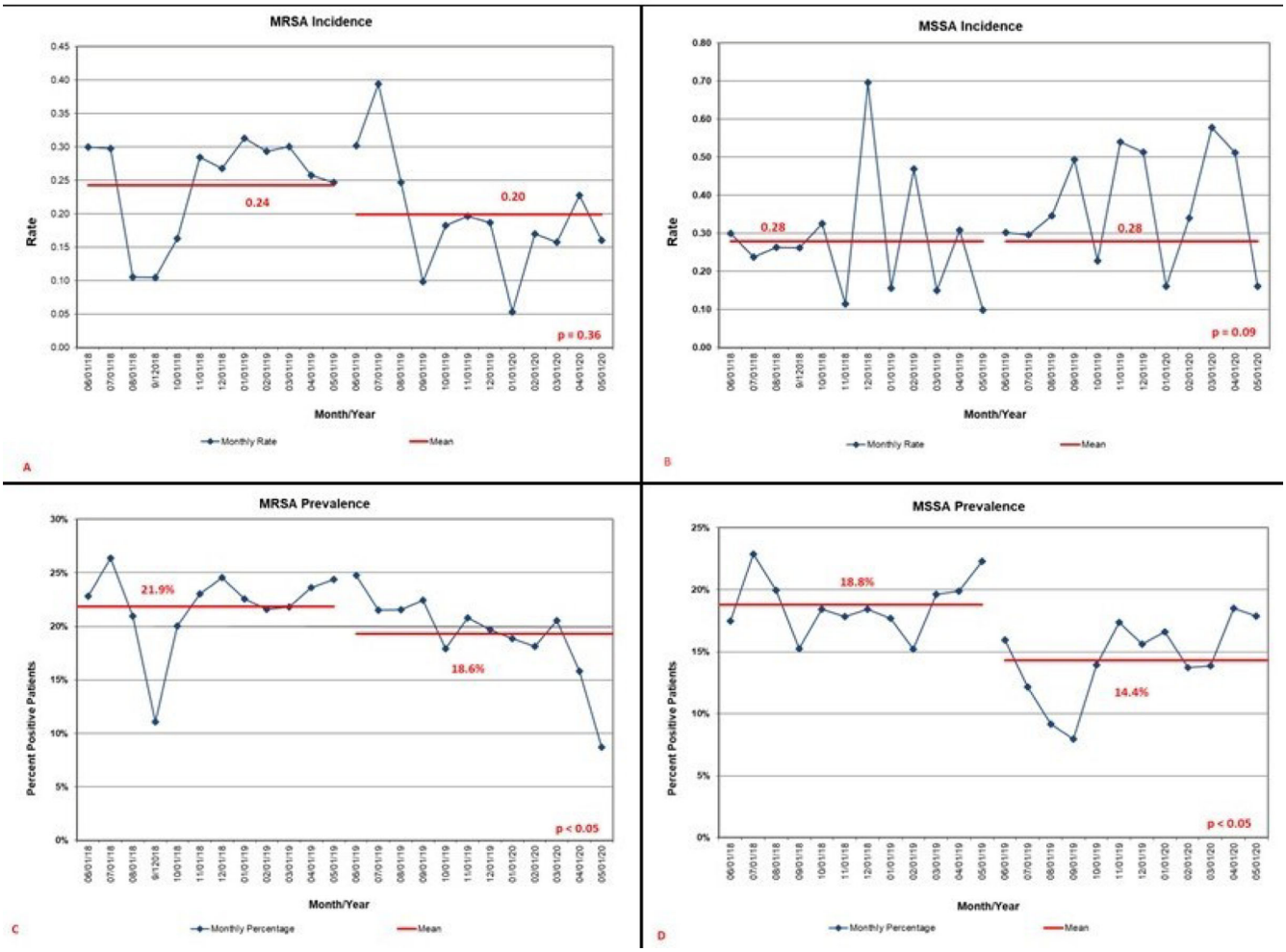
Figure 1. The rate of new positive patients per 1000 patient days A) MRSA incidence and B) MSSA incidence. Percent *S. aureus* positive patients per the average monthly census C) MRSA prevalence and D) MSSA prevalence.



Presentation Type:
Poster Presentation - Top Poster Award
Subject Category: Diagnostic/Microbiology

Implementation of diagnostic stewardship in two surgical ICUs: Time for a blood-culture change

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Background: Blood cultures are commonly ordered for patients with low risk of bacteremia. Liberal blood-culture ordering increases the risk of false-positive results, which can lead to increased length of stay, excess antibiotics, and unnecessary diagnostic procedures. We implemented a blood-culture indication algorithm with data feedback and assessed the impact on ordering volume and percent positivity. **Methods:** We performed a prospective cohort study from February 2022 to November 2022 using historical controls from February 2020 to January 2022. We introduced the blood-culture algorithm (Fig. 1) in 2 adult surgical intensive care units (ICUs). Clinicians reviewed charts of eligible patients with blood cultures weekly to determine whether the blood-culture algorithm was followed. They provided feedback to the unit medical directors weekly. We defined a blood-culture event as ≥1 blood culture within 24 hours. We excluded patients aged <18 years, absolute neutrophil count <500, and heart and lung transplant recipients at the time of blood-culture review. **Results:** In total, 7,315 blood-culture events in the preintervention group and 2,506 blood-culture events in the postintervention group met eligibility criteria. The average monthly blood-culture rate decreased from 190 blood cultures per 1,000 patient days to 142 blood cultures per 1,000 patient days ($P < .01$) after the algorithm was implemented. (Fig. 2) The average monthly blood-culture positivity increased from 11.7% to 14.2% ($P = .13$). Average monthly days of antibiotic therapy (DOT) was lower in the postintervention period than in the preintervention period (2,200 vs 1,940; $P < .01$). (Fig. 3) The ICU length of stay did not change before the intervention compared to after the intervention: 10 days (IQR, 5–18) versus 10 days (IQR, 5–17; $P = .63$). The in-hospital mortality rate was lower during the postintervention period, but the difference was not statistically significant: 9.24% versus 8.34% ($P = .17$). The all-cause 30-day mortality was significantly lower during the intervention period: 11.9% versus 9.7% ($P < .01$). The unplanned 30-day readmission percentage was significantly lower during the intervention period (10.6% vs 7.6%; $P < .01$). Over the 9-month intervention, we reviewed 916 blood-culture events in 452 unique patients. Overall, 74.6% of blood cultures followed the algorithm. The most common reasons overall for ordering blood cultures were severe sepsis or septic shock (37%), isolated fever and/or leukocytosis (19%), and documenting clearance of bacteremia (15%) (Table 1). The most common indications for inappropriate blood cultures were isolated fever and/or leukocytosis (53%). **Conclusions:** We introduced a blood-culture algorithm with data feedback in 2 surgical ICUs and observed decreases in blood-culture volume without a negative impact on ICU LOS or mortality rate.

Disclosure: None

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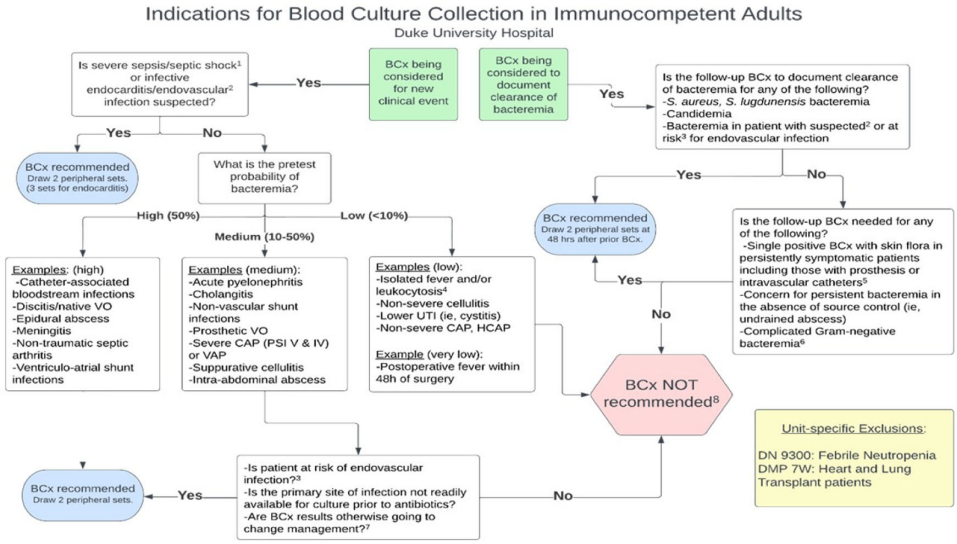

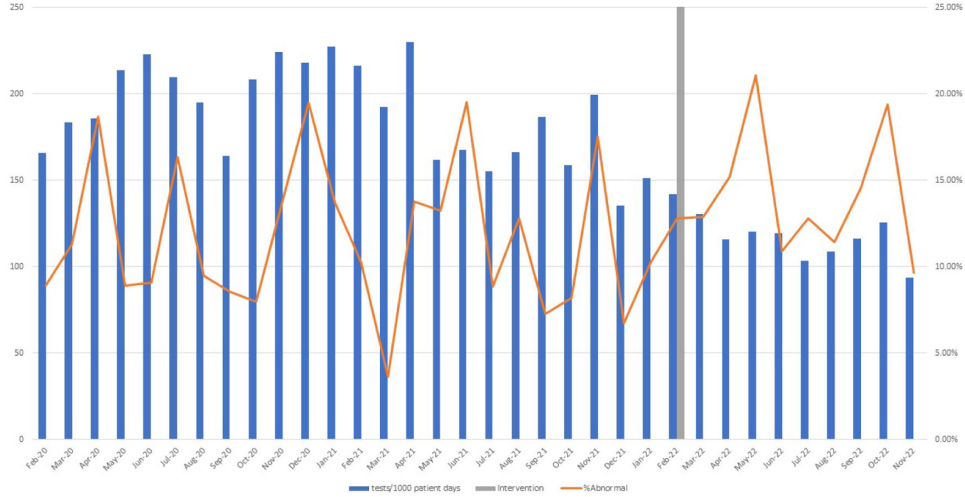

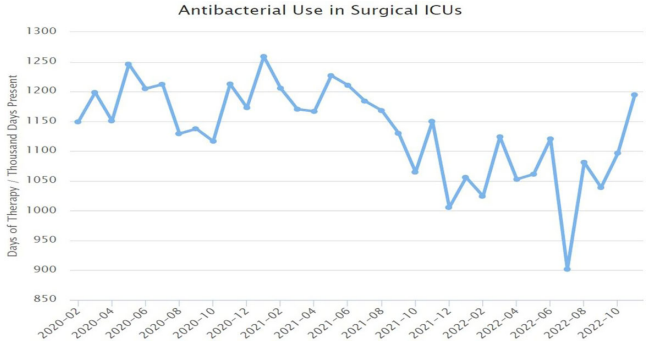

Table 1. Indication for blood culture orders of 916 included patients stratified by appropriate or inappropriate based on clinician chart review

Indication	Total Number (% of all indications)	Appropriate (% of row)	Inappropriate (% of row)
Severe Sepsis or Septic Shock	341 (37.2)	341 (100)	0 (0)
Isolated fever and/or leukocytosis	170 (18.6)	46 (27.1)	124 (72.9)
Documenting clearance of bacteremia	140 (15.3)	115 (82.1)	25 (17.9)
Other	136 (14.8)	78 (57.4)	58 (42.6)
Suspected infective endocarditis or endovascular infection	50 (5.5)	49 (98.0)	1 (2.0)
Ventilator-associated pneumonia	37 (4.0)	35 (94.6)	2 (5.4)
Post-op fever within 48 hours of surgery	11 (1.2)	1 (9.1)	10 (90.9)
Catheter-associated bloodstream infection	6 (0.7)	6 (100)	0 (0)
Severe community-acquired pneumonia	6 (0.7)	4 (66.7)	2 (33.3)
Severe cellulitis or cellulitis in patient with comorbidities	4 (0.4)	3 (75.0)	1 (25.0)
Non-severe community-acquired pneumonia or hospital-acquired pneumonia	4 (0.4)	2 (50.0)	2 (50.0)
Cholangitis	3 (0.3)	3 (100.0)	0 (0)
Acute pyelonephritis	3 (0.3)	2 (66.7)	1 (33.3)
Native septic arthritis	3 (0.3)	2 (66.7)	1 (33.3)
Lower urinary tract infection	1 (0.1)	1 (100)	0 (0)
Meningitis	1 (0.1)	1 (100)	0 (0)
Total	916	689	227

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