Table 1. The summary of the results from the baseline and intervention scenarios

Intervention scenarios with % facility-wide HH compliance (no decolonization in baseline)	The mean (IQR) of incident CRE-colonized patients (per 10000 patient-days)	The reduction in incident CRE-colonized patients relative to the baseline: the % mean reduction (IQR)
30% HH compliance (baseline)	29.1 (7.5 – 44.2)	NA
30% HH compliance with decolonization	14.5 (2.2 – 23.7)	50.2 (-26.3 – 87.9)
35% HH compliance with decolonization	8.2 (1.4 – 12.3)	71.9 (23.4 – 94.0)

Note. IQR: interquartile range; CRE: carbapenem-resistant Enterobacterales.

patient days. For decolonization with the baseline HH, the mean incidence rate decreased to 14.5 per 10,000 patient days, which is a 50.2% decrease relative to the baseline incidence (Table 1). The decolonization scenario with a slightly improved HH compliance of 35% produced a relative reduction of 71.9% relative to the baseline incidence. **Conclusions:** Our analysis shows that decolonization, combined with modest improvement in HH compliance, could lead to large decreases in pathogen transmission. In turn, this model implies that efforts to identify and improve decolonization strategies for better patient safety in health care may be needed and are worth exploring.

Disclosures: None

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The impact of a blood-culture diagnostic stewardship intervention on utilization rates and antimicrobial stewardship

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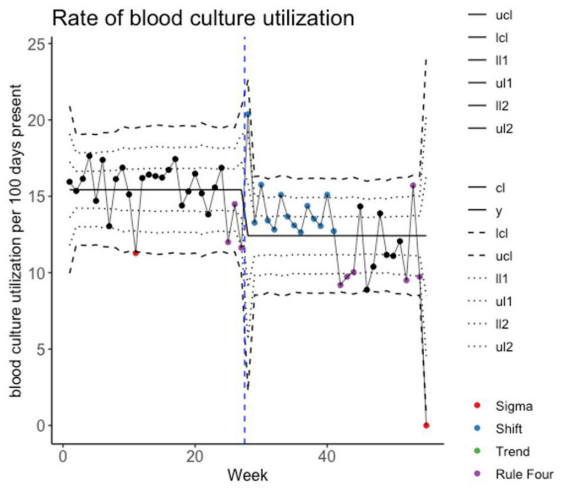
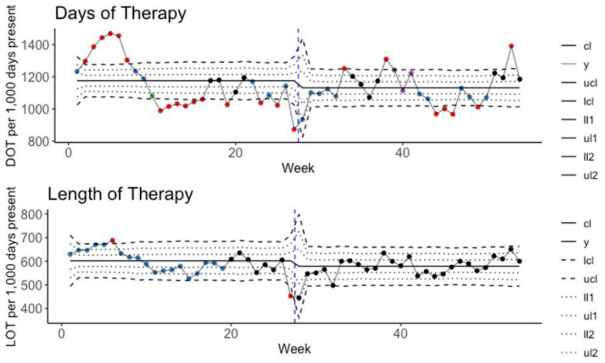
Figures:

Figure 1 - Blood culture utilization



This figure represents a u-chart for blood culture utilization per 100 days present (y-axis) over the study period (x-axis). The blue dashed line represents the start of the intervention (week 28).

Figure 2- Antibiotic Utilization



Legend for figure 2- This figure represents a u-chart for days of therapy (DOT) per 1,000 days present (top) and length of therapy (LOT) per 1,000 days present (bottom) over the study period. The blue dashed line represents the start of the intervention (week 28).

Background: Blood cultures are often ordered when an infection is suspected; however, they have a low yield in most cases. The overuse of blood culture is associated with high contamination rates, resulting in excess diagnostics, unnecessary antibiotics, longer hospital stays, and higher hospital costs. We evaluated the safety of a multifaceted intervention, which encompassed education and blood-culture restriction, and its impact on blood-culture utilization and antibiotic use in adult intensive care unit (ICU) patients. **Methods:** The study was performed between October 2020 and October 2021 in the 12 general medicine and specialty ICUs of a quaternary academic care center. The intervention, implemented in April 2021, included providing education to ICU and infectious disease physicians based on an algorithm adapted from the Johns Hopkins DISTRIBUTE study in addition to restricting blood-culture ordering on these units to these providers. The month of April 2021 was excluded as a washout period. Study outcomes comprised blood-culture utilization, blood-culture positivity, days of therapy (DOT), and length of therapy (LOT), which were compared across the study periods using IRR or the Pearson χ^2 test, as appropriate. In addition, 30-day mortality and 30-

Table 1- Multiple Cox Proportional Hazard Regression Analysis:

	30-day Mortality		30-day ICU Readmission	
Predicters	HR (95% CI)	P value	HR (95% CI)	P value
Post-intervention (vs. pre-intervention)	1.111 (0.932-1.324)	0.241	1.013 (0.845-1.214)	0.888
Age (years)	1.021 (1.015-1.028)	<0.001	0.997 (0.991-1.002)	0.257
Male (vs. female)	0.986 (0.827-1.175)	0.87	0.969 (0.808-1.163)	0.738
Transplant (vs. non-transplant)	0.361 (0.231-0.563)	<0.001	2.498 (1.966-3.174)	<0.001
Positive SARS-COV2 during admission (vs negative)	2.746 (2.153-3.503)	<0.001	0.384 (0.216-0.684)	<0.001
No SARS-COV2 testing during admission (vs negative)	2.265 (1.817-2.822)	<0.001	0.919 (0.729-1.16)	0.478
Positive blood culture (vs negative)	1.478 (1.164-1.877)	0.001	0.584 (0.332-1.029)	0.063
No blood culture (vs negative)	0.262 (0.207-0.331)	<0.001	0.652 (0.443-0.959)	0.03
Stay in Both MICU and SICU (vs. SICU alone)	0.952 (0.724-1.25)	0.722	0.469 (0.31-0.709)	<0.001
Stay in MICU alone (vs. SICU alone)	1.825 (1.509-2.208)	<0.001	1.14 (0.935-1.39)	0.197
Antimicrobials days of therapy per days present	1.131 (1.093-1.171)	<0.001	1.015 (0.944-1.092)	0.68
Number of negative blood cultures during admission	0.957 (0.917-0.999	0.045	0.705 (0.607-0.818)	<0.001
Length of stays (days)	0.998 (0.997-0.999)	<0.001	1 (0.999-1.001)	0.92

HR: Hazard Ratio; MICU: Medical Intensive Care Unit; SICU: Surgical Intensive Care Unit; SARS-COV2: Severe Acute Respiratory Syndrome Coronavirus 2

day ICU readmission were evaluated utilizing multiple COX regression models. **Results:** In total, 6,303 patients (2,087 MICU, 3,636 SICU, and 580 both) were included in the study, with a median age of 65 years (IQR, 21). Most participants were male (57.5%), with a median length of stay of 175 hours (IQR, 186). After the intervention, blood-culture utilization rates decreased from 15.4% to 12.4% (IRR 0.80, 95% CI, 0.76–0.85) (Fig. 1). There was no difference in blood-culture positivity between the preintervention period (11.05%) and the postintervention period (11.64%; $P = .459$). Days of therapy decreased from 1,180 to 1,130 per 1,000 patient days (IRR, 0.96; 95% CI, 0.95–0.98), and the length of therapy decreased from 602 to 579 per 1,000 patient days (IRR, 0.96; 95% CI, 0.94–0.99) (Fig. 2). There was no difference in 30-day mortality ($P = .241$) nor 30-day ICU readmission ($P = .888$) across the study periods after adjusting for potential confounders (Table 1). **Conclusions:** Our multifaceted intervention decreased blood-culture and antimicrobial utilization in the ICUs without significantly affecting the positivity rate, mortality, or readmission. This study suggests that educating providers on appropriate blood-culture use along with restriction could safely improve healthcare outcomes. Further studies are warranted to validate our results across various institutions and to evaluate the impact of blood-culture optimization in non-ICU patients.

Disclosures: None

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Evaluation of interprovider consistency in interpretation of blood culture guidelines at an academic medical center

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Background: Blood cultures are a fundamental tool in the diagnosis of infections, but they can lead to clinical confusion and waste resources when they yield false results. To optimize blood-culture orders at our institution, we developed an evidence-based clinical guideline (Fig. 1) to be used by frontline providers on nonneutropenic hospitalized adult inpatients. We retrospectively reviewed charts of patients with positive blood cultures to evaluate whether frontline providers and infectious diseases (ID) attending physicians were able to consistently interpret the guidelines to determine whether blood cultures were drawn appropriately. **Methods:** In total, 95 nonneutropenic adults with an initial positive blood culture collected while on an inpatient unit were identified through a query of the electronic medical record from January 2021 through June 2022. Patients with polymicrobial bacteremia and bacteremia due to *Enterococcus*, *Streptococcus*, and gram-positive rods were excluded. Moreover, 4 medical resident physicians reviewed all patients and 2 ID attending physicians reviewed one-quarter of cases; all were blinded to the culture results. Blood cultures were determined to be either appropriately or inappropriately performed based on our institution's guideline. The free-marginal multirater κ statistics with 95% CIs were calculated to evaluate interrater agreement. **Results:** Baseline patient demographics are shown in Table 1. Immune compromise without neutropenia was noted in 21 of 95 patients. Most patients were at high risk for bacteremia (72%) per our institutional guideline, most of whom were septic (67.7%). Low risk for bacteremia was found in only 12.3% of reviews. Medical resident physicians, ID attending physicians, and all reviewers combined agreed on whether blood cultures were drawn appropriately or inappropriately (84.2%, 92%, and 86.4% agreement rates, respectively). The free-marginal κ statistic was highest for ID attending physicians (0.84; 95% CI, 0.62–0.78), followed by attending physicians and resident physicians combined (0.73; 95% CI, 0.56–0.90), and resident physicians alone (0.68; 95% CI, 0.58–0.78). In the 21 patients with immune compromise, the agreement rates on blood culture appropriateness remained high among all reviewers, resident physicians, and ID attending physicians were 86.6%, 90.5%, and 95%, respectively. **Conclusions:** In our retrospective study of nonneutropenic hospitalized adult inpatients, frontline providers and ID attending physicians interpreted blood-culture guidelines consistently, largely agreeing on which patients had cultures drawn appropriately. Agreement among ID attending physicians was excellent and remained substantial among medical resident physicians. Guidelines on the appropriate use of blood cultures are vital to limiting

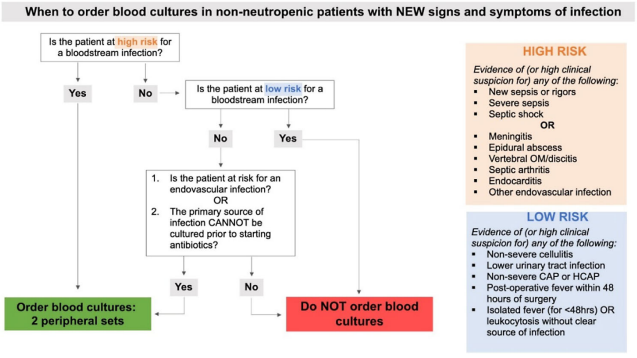

Table 1

Baseline Characteristics	n (%)
Age[1]	63 (50-76.5)
Female	38 (40.0)
Race	
White	44 (46.3)
Black	17 (17.9)
Asian	12 (12.6)
Other or unknown	22 (23.2)
Immune compromise	21 (22.1)
Receiving chemotherapy	8 (8.4)
Solid organ or stem cell transplant	6 (6.3)
Other immune suppressing medication	5 (5.2)
Cirrhosis	2 (2.1)
Organism	
Staphylococcus aureus	16 (16.8)
Coagulase-negative *Staphylococcus*	40 (42.1)
Gram-negative bacteremia	37 (38.9)
Candida species	2 (2.1)
Risk of bacteremia	
High risk	311 (72.3)
Sepsis syndrome[2]	291 (67.7)
Low risk	53 (12.3)
Risk for endovascular infection or source unable to be cultured	19 (4.4)
None of the above	47 (10.9)
Total number of chart reviews	430 (100)

[1] Statistics presented: median (interquartile range)
[2] Sepsis syndrome: new sepsis, rigors, severe sepsis, or septic shock