NAP1/ST1/RT027 accounted for **Conclusions:** The genomic epidemiology of *C. difficile* across this large community cohort demonstrated a diverse group of strain types that was similarly distributed across epidemiological classifications and between index and recurrent cases. SNP analysis indicated that direct transmission between cases was uncommon.
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Subject Category: CLABSI
Peripheral intravascular catheter-associated bloodstream infection in the medical–surgical ICU
Nancy Hogle; Patrick Burke and Thomas Fraser

Background: Prompt removal of unnecessary central venous catheters (CVC) may reduce central-line–associated bloodstream infection (CLABSI). Primary non–central-line–associated hospital-acquired bloodstream infection (BSI), including peripheral intravascular (PIV) catheter-associated bloodstream infection (PIVABSI) remains a problem. Hospitals use CLABSI surveillance data to measure patient safety, yet this measure alone fails to describe the burden of total intravascular device-related infection. We described non-CLABSI primary BSI due to PIV in our medical–surgical ICU population. **Methods:** Hospital-wide surveillance for primary hospital-acquired BSI, including CLABSI, was conducted in accordance with NHSN protocol. We measured PIV catheter days and central-line days using a database including nursing device documentation and patient census data to count the number of patients with 1 or more devices in place in each location, counted at the same time each day. By substituting the role of the CVC with short or midline PIV in NHSN CLABSI surveillance protocols, we performed surveillance for PIVABSI. We defined PIVABSI as a patient without CVC and either a short or midline catheter in place for >2 calendar days on the date of BSI. Patients with BSI and both CVC and PIV were counted as CLABSI. We compared CVC and PIV utilization and the incidence density of CLABSI and PIVABSI in 8 medical and surgical ICUs at our large teaching hospital. We used OpenEpi version 3.01 software to test the hypothesis that the incidence density of CLABSI would be significantly different from that of PIVABSI. **Results:** From January to September 2021, there were 16 CLABSIs and 12 primary non–central-line–associated hospital-acquired BSIs, all 12 were PIVABSIs. Of these 12, 8 had >1 PIV in place and none were midlines. There were 13,418 central-line days, 10,897 short and midline peripheral IV days, and 22,415 patient days, resulting in device utilization ratios of 0.60 and 0.49, respectively. The incidence density of CLABSI was 1.2 per 1,000 central-line days, although the incidence density of PIVABSI was 1.1 per 1,000 peripheral IV days ($P = .84$). There was no difference in pathogens between the 2 groups. **Conclusions:** PIVABSI represented more than one-third of the total primary hospital-acquired BSIs in our medical and surgical ICUs. Total BSI surveillance is feasible. Efforts to reduce CLABSI should be part of a broader strategy to decrease total hospital-acquired BSI from all vascular access devices.
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Blood-culture ordering practices in patients with a central line at an academic medical center—Iowa, 2020
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Background: The IDSA has a clinical definition for catheter-related bloodstream infection (CRBSI) that requires ≥1 set of blood cultures from the catheter and ≥1 set from a peripheral vein. However, because blood cultures obtained from a central line may represent contamination rather than true infection, many institutions discourage blood cultures from central lines. We describe blood culture ordering practices in patients with a central line. **Methods:** The University of Iowa Hospitals & Clinics is an academic medical center with 860 hospital beds. We retrospectively collected data for blood cultures obtained from adult patients (aged ≥18 years) in the emergency department or an inpatient unit during 2020. We focused on the first blood cultures obtained during each admission because they are usually obtained before antibiotic initiation and are the most important opportunity to diagnose bacteremia. We classified blood-culture orders as follows: CRBSI workup, non-CRBSI sepsis workup, or incomplete workup. We defined CRBSI workup as ≥1 blood culture from a central line and ≥1 peripheral blood culture (IDSA guidelines). We defined non-CRBSI sepsis workup as ≥2 peripheral blood cultures without cultures from a central line because providers might have suspected secondary bacteremia rather than CRBSI. We defined incomplete workup as any order that did not meet the CRBSI or non-CRBSI sepsis workup. This occurred when only 1 peripheral culture was obtained or when ≥1 central-line culture was obtained without peripheral cultures. **Results:** We included 1,150 patient admissions with 4,071 blood cultures. In total, 349 patient admissions with blood culture orders (30.4%) met CRBSI workup. 62.8% were deemed non-CRBSI sepsis workup, and 6.9% were deemed an incomplete workup. Stratified by location, ICUs had the highest percentage of orders with incomplete workups (8.8%), followed by wards (7.2%) and the emergency department (5.1%). In total, 204 patient admissions had ≥1 positive blood culture (17.7%). The most frequently isolated organisms were *Staphylococcus epidermidis* (n = 33, 16.2%), *Staphylococcus aureus* (n = 16, 7.8%), and *Escherichia coli* (n = 15, 7.4%) **Conclusions:** Analysis of blood culture data allowed us to identify units at our institute that were underperforming in terms of ordering the necessary blood cultures to diagnose CRBSI. Being familiar with CRBSI guidelines as well as decreasing inappropriate ordering will help lead to early and proper diagnosis of CRBSI which can reduce its morbidity, mortality, and cost.
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The evaluation of central-line–associated bloodstream infection (CLABSI) preventability at an academic institution
Leon Hsueh; Daniel Uslan and Annabelle De St. Maurice

Background: In 2008, the hospital-acquired conditions (HACs) initiative labeled central-line–associated bloodstream infections (CLABSIs) as preventable "never events" that could no longer be reimbursed by Medicare. However, some patients have inherent unpreventable etiologies for bacteremia, such as obstructive biliary malignancies. We assessed the number of CLABSIs that were reasonably preventable. **Methods:** We examined all CLABSI cases at 2 academic medical centers over a 2-year period (2019–2021). We established 3 categories of CLABSIs: (1) preventable CLABSI (pCLABSI); (2) end-of-life CLABSI (EOL-CLABSI), which were CLABSIs that were caused by underlying disease processes in patients who were nearing the end of their lives due to a debilitating comorbidity; and (3) definition-based (dCLABSI), which met NHSN criteria for a CLABSI but, based on the pathogen and the clinical situation, likely occurred as a consequence of a patient's comorbidities. Two experienced infectious diseases physicians (D.U. and A.S.M.) reviewed the charts of each patient with a CLABSI and, based on expert opinion, determined the category for each

CLABSI. **Results:** Over the 2-year period, 147 CLABSIs were identified among the 2 hospitals, 66 (44.9%) of which occurred in an ICU. Most CLABSIs were pCLABSIs, making up 99 CLABSIs (67.3%). In comparison, 20 cases were categorized EOL-CLABSIs (13.6%), although 26 cases were dCLABSIs (17.7%), and 2 cases could not be classified. There was no difference in the distribution of CLABSI types in an ICU versus a non-ICU setting (χ^2 $P = .265$). However, we detected microbiologic differences between pCLABSIs, EOL-CLABSIs, and dCLABSIs (χ^2 $P < .001$), with gram-positive cocci making up the large majority of pCLABSIs (62.6%), followed by *Candida* spp (24.2%). Gram-negative bacilli (GNR) made up 11.1% of pCLABSIs. In comparison, GNRs were more prevalent in EOL-CLABSIs and dCLABSIs, making up 30.0% and 38.5% of each CLABSI type, respectively. **Conclusions:** Two-thirds of CLABSIs were deemed preventable. Central lines are important for managing critically ill patients, many of whom have inherent risk factors for bloodstream infections. EOL-CLABSIs highlight the potential for early care discussions to avoid CLABSIs at the end of a patient's life and to avoid unnecessary blood cultures for patients on comfort care. Additionally, the pCLABSI distinction allows hospital epidemiology teams to focus on the CLABSI cases that can realistically be prevented with appropriate central-line care, techniques, and hand hygiene. Creating these categories allows hospital systems to use more targeted approaches for improving CLABSI rates.

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The effectiveness of a dedicated central venous access care team to prevent catheter-related bloodstream infections

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Background: Catheter-related bloodstream infection (CRBSI) rates remain high despite the use of an insertion bundle. We hypothesized that line care and maintenance by a dedicated team would help decrease CRBSI rates. This study was conducted in The Medical City (TMC), is a 526-bed, private, tertiary-care center in Pasig City, Philippines. **Methods:** All adult hospitalized patients from October 1, 2020, to October 31, 2021, with a newly inserted temporary central venous catheter (CVC) were eligible for inclusion. CRBSI rates before the intervention (October 2019 to March 2020) and after the intervention (April to October 2021) were compared. The intervention arm consisted of a dedicated central venous access team (CVAT) who provided education and performed daily line care and dressing changes per protocol. A series of χ^2 and Wilcoxon rank-sum tests were performed to compare characteristics between exposure groups. Incidence rates of CRBSI before and after the intervention were compared using an incidence rate ratio approach. **Results:** In total, 209 CVCs were enrolled in the study, with 103 CVCs (49.28%) in the preintervention arm and 106 CVCs (50.72%) in the postintervention arm. Baseline patient characteristics were similar. CRBSIs were more frequent in the preintervention arm than the postintervention arm (39 of 103 vs 28 of 106; $P = .08$). The CRBSI incidence density rate was higher in the preintervention arm than the postintervention arm, but the difference was not statistically significant (37.46 per 1,000 patient days vs 25.97 per 1,000 patient days; $P = .14$). Median time to CRBSI was similar in both groups (9 vs 8 days). **Conclusions:** Baseline CRBSI rates were high and risk of infection increased by day 8 after line insertion. We detected a decreasing trend in rates of CRBSI with a dedicated CVAT, but multiple interventions are likely needed to influence overall rates.

CHARACTERISTIC	Pre-Intervention	Post-Intervention	p-value
N, catheters (%)	103 (49.28)	106 (50.72)	-
Age (yr)	61.64 ± 16.20	62.92 ± 17.53	0.59
Sex, female	42 (40.78)	52 (49.06)	0.23
Reason for CVC			
Hemodialysis	23 (22.33%)	29 (27.36%)	0.40
Access	80 (77.67%)	77 (72.64%)	
CRBSI			
Infection, n	39 (37.86)	28 (26.42)	0.08
Catheter days, n	1,041	1,078	-
Incidence density rate	37.46 (26.64-51.21)	25.97 (17.26-37.54)	0.14
Time to CRBSI, median, days (range)	9 (3, 15)	8 (4, 11)	0.42
Pathogen			
Gram positive	10 (25.64)	3 (10.71)	
Gram negative	17 (43.59)	14 (50)	0.12
Both	3 (7.69)	7 (25)	
Fungal	9 (23.08)	4 (14.29)	
Adverse events			
Occlusion	1 (0.97)	2 (1.89)	0.58
Others	-	1 (0.94)	0.32
Outcome			
Alive	61 (59.22)	49 (46.23)	0.07
Expired	42 (40.78)	57 (53.77)	

Table 1: Baseline Characteristics and Outcomes the Pre vs. Post-Intervention Groups

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Hospital-acquired bloodstream infections in patients with and without hepatic failure

Jordan Bosco; Patrick Burke; Francisco Marco Canosa; Stephen Wilson; Steven Gordon and Thomas Fraser

Background: The NHSN parameter estimate for predicted number of central-line–associated bloodstream infection (CLABSI) is the same for gastroenterology wards as other specialty wards, such as behavioral health and gerontology. We conducted this study to contribute to the body of knowledge surrounding the risk for hospital-acquired bloodstream infection (HABSI) in patients with and without hepatic failure. The Cleveland Clinic is a 1,200-bed, multispecialty hospital with a solid-organ transplant service. Patients with hepatic failure who do not require critical care are housed on 36-bed unit A. On unit A, 43% of patients are under hepatology or gastroenterology service, although 51% of patients are under general internal medicine. Overall, unit A has a high incidence of HABSI. **Methods:** Surveillance for HABSI and CLABSI is performed at the Cleveland Clinic per NHSN protocol. All patients with a midnight stay on unit A from January 2019 through September 2021 were dichotomized as having hepatic failure (yes or no) if they ever received the *International Classification of Diseases Tenth Revision* code for "hepatic failure, not elsewhere classified." We joined the diagnostic code to patient days and central-line-days databases and summarized the data using Microsoft Excel software. We stratified the number of patients, patient days, device days, infection classification, and hospital length of stay by whether the patient had hepatic failure, and we compared the incidence of HABSI and CLABSI between the 2 groups using OpenEpi version 3.01 software. **Results:** We identified 72 HABSIs among 4,285 patients who stayed on unit A for 30,910 patient days during the study period. The incidences of HABSI in patients with and without hepatic failure were 39.0 and 13.9 per 10,000 patient days, respectively ($P < .001$). The incidence of CLABSI was 5.4 and 1.9 per 1,000 line days, respectively ($P = .01$). Patients with hepatic failure stayed longer (11.5 vs 5.9 days), yet the central-line utilization ratios were not substantially different (0.25 vs 0.24). *Enterococcus* was the most common pathogen involved in CLABSI in both groups (Table 2). **Conclusions:** Patients with hepatic failure experienced CLABSI more frequently than patients without hepatic failure, stayed longer in the hospital, and were less likely have HABSI attributed to another primary focus of infection according to NHSN definitions. Although hepatic failure may be among the most severe conditions among patients in a gastroenterology