

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 ($\chi^2 P = .265$). However, we detected microbiologic differences between pCLABSIs, EOL-CLABSIs, and dCLABSIs ($\chi^2 P < .001$), 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

Fortune Charles Fil de Lara; Maria Jesusa Mano; Karl Evans Henson; Jia An Bello and Cybele Lara Abad

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.

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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

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 Pre vs. Post-Intervention Groups

Table – Characteristics of patients on Unit A who did and did not have a diagnosis of Hepatic Failure, January 2019 -September 2021

	N patients	Patient days	Length of stay (days)	Central line days	Central Line Utilization Ratio	Infection Classification			p-value ¹
						N Secondary BSI	N Primary HABS, Not CLABS	CLABS	
Hepatic Failure	1000	11547	11.5	2934	0.25	6	23	16	0.04
No Hepatic Failure	3285	19363	5.9	4709	0.24	10	8	9	

¹ Chi-squared test to compare the distribution of infection classification in patients with and without hepatic failure

Table 2—Distribution of pathogens involved in hospital-acquired bloodstream infection in patients who did and did not have hepatic failure

Organism	Hepatic failure	No hepatic failure
Enterococcus	16	14
Enterobacteriales	16	7
Yeast	10	4
Staphylococcus aureus	4	4
Common Commensal	7	1
Other	3	4

ward, we have demonstrated that these units house a population uniquely susceptible to HABS and CLABS.

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Central-line associated bloodstream infection (CLABS) in patients hospitalized with COVID-19

Minji Kang; Zane Conrad; Elizabeth Thomas; Doramarie Arocha and Julie Trivedi

Background: Significant increases in healthcare-associated infections (HAIs) including central-line associated blood stream infections (CLABSIs) have been reported during the COVID-19 pandemic. Acute-care hospitals have faced staffing and personal protective equipment shortages, increased critical care capacity, and diversion of resources from traditional HAI surveillance and prevention efforts. In this study, we characterized CLABSIs among patients with COVID-19 and compared demographics, comorbidities, and outcomes between patients diagnosed with CLABS with and without COVID-19. **Methods:** This is an observational retrospective cohort study of all patients diagnosed with CLABS as defined by NHSN at William P. Clements Jr. University Hospital from April 1, 2020, through September 30, 2021. A retrospective chart review was conducted to identify demographics, comorbidities, and outcomes of hospitalized patients diagnosed with CLABS. Patients hospitalized with and without COVID-19 were compared using the independent-sample *t* test for means and the χ^2 test for proportions. **Results:** Overall, 82 patients diagnosed with CLABS between April 1, 2020, to September 30, 2021, among whom 31 (38%) were hospitalized with COVID-19 and 51 (62%) were not hospitalized with COVID-19. Patients hospitalized with COVID-19 were significantly more likely to be obese (58% for COVID-19 positive vs 26% for COVID-19 negative; *P* = .01) and to require extracorporeal membrane oxygenation (19% vs 4%; *P* = .04). However, COVID-19 patients were significantly less likely to have hematologic malignancy (7% vs 28%; *P* = .03), undergone bone marrow transplantation (0% vs 18%; *P* = .01), or have neutropenia (3% vs 22%; *P* = .03). There were no significant differences in line type or organism identified. Gram-positive pathogens were identified in 16 patients (52%) hospitalized with COVID-19. Gram-negative pathogens were identified in 3 patients (10%); fungal organisms were identified in 10 patients (32%), and 2 cases (7%) were polymicrobial. Patients with COVID-19 were significantly more likely to require an ICU stay (84% vs 43%). **Conclusions:** High device

Table 1. Characteristics of patients with CLABS hospitalized with and without COVID-19

	Total N=82	COVID-19 Positive N=31 (38%)	COVID-19 Negative N=51 (62%)	P-value
Male	47 (57%)	19 (61%)	28 (55%)	0.65
Age (mean ± SD)	58.1± 15.2	55.9± 15.3	50.4±15.2	0.31
Comorbidities				
Obesity	31 (38%)	18 (58%)	13 (26%)	0.01
DM	20 (24%)	11 (36%)	9 (18%)	0.11
Solid tumor	11 (13%)	2 (7%)	9 (18%)	0.19
Heme malignancy	16 (20%)	2 (7%)	14 (28%)	0.02
Solid organ transplant	7 (9%)	3 (10%)	4 (8%)	1.00
BMT	9 (11%)	0 (0%)	9 (18%)	0.012
Neutropenia	12 (15%)	1 (3%)	11 (22%)	0.026
Immunocompromised	32 (39%)	7 (23%)	25 (49%)	0.02
Recent Surgery	7 (9%)	1 (3%)	6 (12%)	0.25
ECMO	8 (10%)	6 (19%)	2 (4%)	0.04
Location				<0.001
Ward	34 (41%)	5 (16%)	29 (57%)	
Intensive Care Unit	48 (59%)	26 (84%)	22 (43%)	
Days admitted (mean ± SD)	20.9 ± 20.4	27.1 ± 25.1	17.1 ± 16.1	0.03
Line days (mean ± SD)	15.6 ± 12.4	19.5 ± 17.0	13.2 ± 7.8	0.03
Line type				0.07
PICC	23 (28%)	5 (16%)	18 (35%)	
CVC	19 (23%)	10 (32%)	9 (18%)	
HD	14 (17%)	3 (10%)	11 (22%)	
Port	4 (5%)	1 (3%)	3 (6%)	
More than 1	22 (27%)	12 (39%)	10 (20%)	
Organism				0.38
Gram positive	37(45%)	16 (52%)	21 (41%)	
Gram negative	16 (20%)	3 (10%)	13 (26%)	
Fungal	24 (29%)	10 (32%)	14 (28%)	
Polymicrobial	5 (6%)	2 (7%)	3 (6%)	

utilization as well as prolonged hospitalization and line days among patients with COVID-19 along are contributing risk factors for CLABS among patients hospitalized with COVID-19. This finding highlights the need for ongoing HAI surveillance and prevention efforts in patients hospitalized with COVID-19 given their characteristics and increased risk for CLABS. Reinforcing infection prevention efforts by accentuating the importance of optimal line care and regular feedback are crucial, especially among patients hospitalized with COVID-19.

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Human factors analysis of the disinfection of central-line needleless connectors

Richard Martinello; Joan Hebden; Frank Drews and David Pegues

Background: Patients requiring vascular catheters are at risk for bloodstream infections (BSIs), particularly those with central venous access devices (CVADs). Central-line-associated bloodstream infections (CLABSIs) may occur as a result of the introduction of pathogenic microbes during CVAD access procedures, including through the needleless connector. The use of an antiseptic scrub is recommended to disinfect the needleless connector before device access, and this procedure has been shown to reduce the risk for CLABS. We identified perceived barriers and facilitators and assessed compliance with instructions for use of chlorhexidine or alcohol antiseptic products (CHG or IPA; 5-second scrub time plus 5-second dry time) and alcohol antiseptic products (IPA; facility protocol 15-second scrub time plus let dry) for needleless connector disinfection. **Methods:** We performed a multiple-methods study involving focus groups composed of a convenience sample of nurses and clinical observations of CVAD needleless-connector access procedures in 3 medical ICUs and 1 surgical ICU at 2 academic medical centers. We used open-ended questions to guide the focus-group discussions. We directly observed nursing staff performing needleless-connector disinfection following a time-motion paradigm using an electronic tool to document the observed needleless-connector access events and to measure needleless-connector