Presentation Type:
Poster Presentation
Adverse Events Associated With Midline Vascular Catheters

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Background: Central-line–associated bloodstream infections (CLABSIs) result in increased patient morbidity. Guidelines recommend against peripheral venous catheters when access is required for longer than 6 days, often leading to central venous catheter (CVC) placement. To improve vascular access device choice and reduce the potential risk of CLABSI, we implemented a quality improvement initiative comprised of a vascular access algorithm and introduction of a midline vascular access device (MVAD). We report complications associated with MVAD use including deep vein thrombosis (DVT), thrombophlebitis, and BSI. **Methods:** A prospective quality improvement assessment from October 2017 through March 2018. All MVADs were monitored for DVT, thrombophlebitis, and BSI. Insertion time and removal of MVAD were tracked, as well as presence of other vascular access devices. **Results:** From October 2017 through March 2018, 858 MVADs were inserted in 726 different patients, yielding 3,588 MVD days. In total, 6 primary BSIs occurred in patients with MVADs. In patients with only a MVAD, the rate was 0.72 BSI per 1,000 MVAD days, whereas patients with an MVAD as well as a CVC had a rate of 1.98 per 1,000 MVAD days. The overall CLABSI rate at the institution during this period of time was 1.24 per 1,000 CVC days. Also, 29 cases of thrombophlebitis occurred, for a rate of 3.84 per 1,000 catheter days in patients with only an MVAD compared to 4.63 per 1,000 catheter days in patients with an MVAD and a CVC. Also, 25 DVTs occurred during this time, resulting in a rate of 2.88 per 1,000 catheter days in patients with only an MVAD and 4.63 per 1,000 catheter days in patients with multiple vascular-access devices. A significant correlation was noted between MVAD indwell time and BSI ($P = .0021$) and thrombophlebitis ($P = .0041$). The median indwell time for patients experiencing BSI was 16.17 days ± 8.04 days, whereas the median indwell time for patients experiencing thrombophlebitis was 9.24 days ± 7.99 days. **Conclusions:** The implementation of a vascular-access algorithm including MVAD may effectively reduce CVC insertions and BSIs. The rate of BSI in MVAD was below that of CLABSI during the assessment period. Known complications associated with MVAD include DVTs and thrombophlebitis, which correlates with the duration of catheterization, and these risks appear to be further compounded in patients requiring multiple devices for vascular access. Further research into comparing the risk of vascular access of MVAD with CVC is warranted.

Presentation Type:
Poster Presentation
Alcohol Hand Rub Significantly Reduces Overall Bacterial Bioburden on Stethoscopes in a Real-World Clinical Setting

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Background: Stethoscopes are a known vector for microbial transmission; however, common strategies used to clean stethoscopes pose certain barriers that prevent routine cleaning after every use. We aimed to determine whether using readily available alcohol-based hand rub (ABHR) would effectively reduce bacterial bioburden on stethoscopes in a real-world setting. **Methods:** We performed a randomized study on inpatient wards of an academic medical center to assess the impact of using ABHR (AlcareExtra; ethyl alcohol, 80%) on the bacterial bioburden of stethoscopes. Stethoscopes were obtained from healthcare providers after routine use during an inpatient examination and were randomized to control (no intervention) or ABHR disinfection (2 pumps applied to tubing and bell or diaphragm by study personnel, then allowed to dry). Cultures of the tubing and bell or diaphragm were obtained with premoistened cellulose sponges. Sponges were combined with 1% Tween20-PBS and mixed in the Seward Stomacher. The homogenate was centrifuged and all but ~5 mL of the supernatant was discarded. Samples were plated on sheep's blood agar and selective media for clinically important pathogens (CIPs) including *S. aureus*, *Enterococcus* spp, and gram-negative bacteria (GNB). CFU count was determined by counting the number of colonies on each plate and using dilution calculations to calculate the CFU of the original ~5 mL homogenate. **Results:** In total, 80 stethoscopes (40 disinfection, 40 control) were sampled from 46 physicians (MDs) and MD students (57.5%), 13 advanced practice providers (16.3%), and 21 nurses (RNs) and RN students (26.3%). The median CFU count was ~30-fold lower in the disinfection arm compared to control (106 [IQR, 50–381] vs 3,320 [986–4,834]; $P < .0001$). The effect was consistent across provider type, frequency of recent usual stethoscope cleaning, age, and status of pet ownership (Fig. 1). Overall, 26 of 80 (33%) of stethoscopes harbored CIP. The presence of CIP was lower but not significantly different for stethoscopes that underwent disinfection versus controls: *S. aureus* (25% vs 32.5%), *Enterococcus* (2.5% vs 10%), and GNB (2.5% vs 5%). **Conclusions:** Stethoscopes may serve as vectors for clean hands to become recontaminated immediately prior to performing patient care activities. Using ABHR to clean stethoscopes after every use is a practical and effective strategy to reduce overall
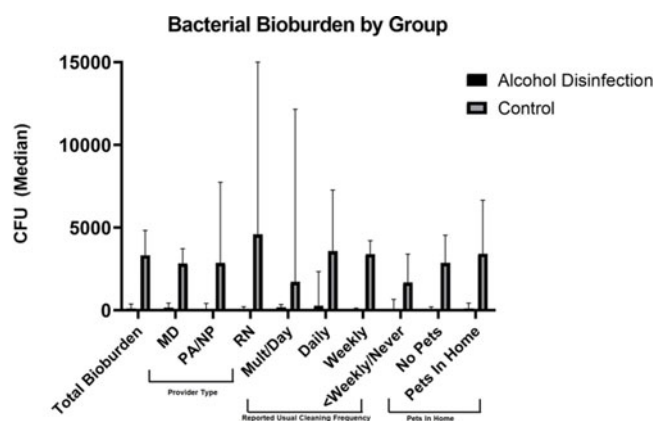

Fig. 1.

bacterial contamination that can be easily incorporated into clinical workflow. Larger studies are needed to determine the efficacy of ABHR at removing CIP from stethoscopes as stethoscopes in both arms were frequently contaminated with CIP. Prior cleaning of stethoscopes on the study day did not seem to impact contamination rates, suggesting the impact of alcohol foam disinfection is short-lived and may need to be repeated frequently (ie, after each use).

Presentation Type:
Poster Presentation
Amidst the CAUTI Metrics Hurley Burly, a Sustained SURly Success Adaptable for Reducing Other Nosocomial Infections
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Background: Surveillance metrics for catheter-associated urinary tract infections (CAUTIs) are subject to ongoing debate and refinement to best capture infectious catheter-related harm (ICRH) and noninfectious catheter-related harm (NCRH). Indwelling urinary catheters cause 5 times more NCRH than ICRH. The commonly used standardized infection ratio (SIR) does not fully capture NCRH nor the impact of prevention efforts in all settings. Alternatively, device utilization rates and ratios (DUR) do not reflect differences in other factors that may describe levels of device use. DUR lose comparability over time and across settings and can mask truly effective interventions by selecting for a higher risk group of catheterized patients. Experts now advocate use of the standardized utilization ratio (SUR). We sought to implement a multidimensional intervention to reduce exposure risk, CAUTI, and NCRH across a 5-hospital healthcare system, totaling 1,692 acute-care beds. **Methods:** The intervention comprised the following elements: (1) an interactive educational campaign comprising one-on-one engagements between infection preventionists and frontline providers, encouraging the use of female external urinary collection devices and male custom-fitted condom catheters, rewarding overall participation, device utilization, hand hygiene, and CAUTI rates; (2) educational emails to all staff from top executives; (3) increasing the urinalysis reflex to culture threshold from >5 to ≥10 WBCs; and (4) clinical decision support (CDS) for ordering urine cultures for patients with indwelling catheters and for encouraging Foley catheter alternatives and catheter removal. Monthly, quality department representatives discuss unit level DURs with managers, who then discuss patient-level device use at daily huddles with physicians and advanced practice providers. Significance was determined using the 2-tailed t test. The results are listed in Table 1. **Discussion:** One year after the intervention, use of device alternatives increased 5-fold, CDS-driven ordering predominated, and the SIR and SUR remained significantly decreased. These successes are especially notable because , a ventricular-assist device program was launched in the postintervention period. By the end of the study, the program became the second-busiest of its type in the United States, resulting in a group of patients at high risk of device use and infection in the postintervention period, but absent in the preintervention period. numerous reports of effective interventions for reducing CAUTI have been published, we found no large studies using the SUR as the main metric. The limitations of this study include the lack of a population SIR and data pertaining to catheter-related bacteriuria and antibiotic usage. However, this approach is easily customizable to any infection, device, and diagnostic test.

Table 1.

Table:

	Pre-Intervention 09-01-17 to 09-15-18	Post-Intervention 09-16-18 to 09-30-19	P value
Mean Monthly CAUTIs (SD)	6.69 (1.97)	3.08 (2.02)	0.0002
Mean Monthly Patient Days (SD)	27071 (1150)	26879 (961)	0.6544
CAUTI/ 10,000 Patient Days (SD)	2.49 (0.77)	1.15 (0.76)	0.0002
Mean Monthly Device Days (SD)	4582 (430)	3837 (357)	0.0001
CAUTI/ 1000 Device Days (SD)	1.47 (0.45)	0.80 (0.55)	0.0035
Mean Monthly Orders for Device Alternatives	9.00	131.43	
Mean Monthly Device-Alternative Days (SD)	108 (177)	541 (34)	<0.0001
Monthly Average SIR (SD)	1.31 (0.41)	0.70 (0.49)	0.0029
Monthly Average SUR (SD)	1.05 (0.09)	0.85 (0.07)	<0.0001
Mean monthly % of total urine culture orders that were CDS-driven	0%	55.91%	

Presentation Type:
Poster Presentation
An Interactive Sociotechnical Analysis of the Implementation of Electronic Decision Support in Antimicrobial Stewardship
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Background: There is great enthusiasm for the potential of decision support tools embedded in the electronic medical record to improve antimicrobial use in hospitals. Yet they are often limited in their ability to change prescriber behavior. Analyzing these tools using an interactive sociotechnical approach (ISTA) can identify