

precautions (SP) may prevent these outcomes, but they are not often used by healthcare workers. Unfortunately, data are largely limited by self-reporting because no standardized tools exist to capture observational data. **Objective:** The specific aim of this study was to describe the relationship between self-reported and observed SP adherence. **Methods:** This multisite, cross-sectional study included 2 elements: (1) surveys of nurses in US hospital units on perceptions of patient safety climate and reported SP adherence and (2) observational SP data. Survey data included 12 items on SP practices (eg, “how often you perform hand hygiene before touching a patient”) and 10 items on SP environment (eg, “my work area is not cluttered”), rated on a 5-point scale from “never” to “always” or from “strongly disagree” to “strongly agree,” respectively. Using novel tools developed and previously pilot tested, we recruited and trained hospital-based staff on observational surveillance methodology to foster the *National Occupational Research Agenda* goals. The 10 observational SP items represented the following 4 categories: (1) hand hygiene, (2) personal protective equipment (PPE), (3) sharps, and (4) soiled linen handling. Observations of healthcare worker–patient interactions followed training and interrater reliability testing. All data were aggregated, and analyses were conducted at the unit level. Pearson correlation coefficients were calculated to determine the relationship between reported and observed SP practices (level of significance, $P < .05$). **Results:** In total, 6,518 SP indications were observed and 500 surveys were collected from nurses on 54 units in 15 hospitals from 6 states. The final analytic sample included 5,285 SP indications and 452 surveys from 43 units in 13 hospitals that provided both types of data. Most indications observed were of HH (72.6%). Overall SP adherence was 64.4%. In descending order, adherence rates were PPE (81.8%), sharps handling (80.9%), linen handling (68.3%), and hand hygiene (58.3%). The aggregate of positive self-reported SP practices was 95.8%, and 77.3% rated unit environment for SP adherence positively. There was no correlation between observed adherence and reported adherence ($r(41) = (-).024, P = .879$). **Conclusions:** In this study, the largest study of SP adherence, observed practice was grossly suboptimal, particularly hand hygiene. Conversely, nurses on the same units rated adherence as high, despite the environment. In combination, both sources of surveillance data provide valuable and actionable insight to target interventions.

Funding: and Disclosure Amanda Hessels reports that she is the principal investigator for the following studies: “Impact of Patient Safety Climate on Infection Prevention Practices and Healthcare Worker and Patient Outcomes” (grant no. DHHS/CDC/NIOSH 1K01OH011186 to Columbia University) and “Simulation to Improve Infection Prevention and Patient Safety: The SIPPS Trial” (AHRQ grant no. R18: 1R18HS026418 to Columbia University).

Doi:[10.1017/ice.2020.1127](https://doi.org/10.1017/ice.2020.1127)

Presentation Type:

Poster Presentation

A Portable, Easily Deployed Approach to Measure Healthcare Professional Contact Networks in Long-Term Care Settings

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Medicine; Treyton Krupp, University of Iowa; Scott Fridkin, Emory Healthcare and Emory University; Matthew Samore, University of Utah School of Medicine; Alberto Segre, Department of Computer Science; Philip Polgreen, University of Iowa

Background: The movement of healthcare professionals (HCPs) induces an indirect contact network: touching a patient or the environment in one area, then again elsewhere, can spread healthcare-associated pathogens from 1 patient to another. Thus, understanding HCP movement is vital to calibrating mathematical models of healthcare-associated infections. Because long-term care facilities (LTCFs) are an important locus of transmission and have been understudied relative to hospitals, we developed a system for measuring contact patterns specifically within an LTCF. **Methods:** To measure HCP movement patterns, we used badges (credit-card-sized, programmable, battery-powered devices with wireless proximity sensors) worn by HCPs and placed in 30 locations for 3 days. Each badge broadcasts a brief message every 8 seconds. When received by other badges within range, the recipients recorded the time, source badge identifier, and signal strength. By fusing the data collected by all badges with a facility map, we estimated when and for how long each HCP was in any of the locations where instruments had been installed. **Results:** Combining the messages captured by all of our devices, we calculated the dwell time for each job type (eg, nurses, nursing assistants, physical therapists) in different locations (eg, resident rooms, dining areas, nurses stations, hallways, etc). Although dwell times over all job and area types averaged ~100 seconds, the standard deviation was large (115 seconds), with a mean of maximums by job type of ~450 seconds. For example, nursing assistants spent substantially more time in resident rooms and transitioned across rooms at a much higher rate. Overall, each distribution exhibits a power-law-like characteristic. By aggregating the data from devices with location data extracted from the floor plan, we were able to produce an explicit trace for each individual (identified only by job type) for each day and to compute cross-table transition probabilities by area for each job type. **Conclusions:** We developed a portable system for measuring contact patterns in long-term care settings. Our results confirm that frequent interactions between HCPs and LTC residents occur, but they are not uniform across job types or resident locations. The data produced by our system can be used to better calibrate mathematical models of pathogen spread in LTCs. Moreover, our system can be easily and quickly deployed to any healthcare settings to similarly inform outbreak investigations.

Funding: None

Disclosures: Scott Fridkin reports that his spouse receives a consulting fee from the vaccine industry.

Doi:[10.1017/ice.2020.1128](https://doi.org/10.1017/ice.2020.1128)

Presentation Type:

Poster Presentation

A Prevention Initiative to Reduce Healthcare-Associated Bloodstream Infections in a Spanish University Hospital

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Background: Bloodstream infections are one of the main adverse effects of healthcare in Spain. In our hospital, we have reported that the mean incremental cost of patients who develop bacteremia during admission was €15,526 (US \$18,314.62) per discharge, representing an annual increment in hospital cost of €1,108,190 (US\$1,307,232) in 2005–2012. Moreover, we have also observed that only 15.4% of episodes of our bacteremia occur in intensive care units, with most of these infections (67%) occurring in conventional units.¹ Therefore, we started several initiatives to reduce healthcare-associated bloodstream infections. Herein, we describe one of these initiatives, which is the implementation of the intravascular therapy team (ITT) and its effect on the observed healthcare-associated bloodstream infections. **Methods:** This retrospective analysis evaluated the incidence of healthcare-associated bloodstream infections in a University Hospital of 520 beds from January 2014 to June 2019. The ITT was implemented in 2017. This is a multidisciplinary team with 2 specialists in infection control and 2 specialists in intravascular therapy. We evaluated the annual incidence rate of healthcare-associated bloodstream infections (number of bacteremia episodes per 1,000 days of hospital stay) and its relation with the interventions carried out

by the multidisciplinary team. **Results:** The annual incidences of healthcare-associated bloodstream infections (episodes per 1,000 days of hospital stay) were 0.50 (2014), 0.46 (2015), 0.58 (2016), 0.69 (2017), 0.60 (2018), 0.51 (first quarter 2019), and 0.38 (second quarter 2019, 0.38), respectively. The highest incidence of bacteremia was observed in 2017 when the ITT started the following actions: (1) following a clinical protocol to improve the appropriateness in the utilization of new devices such as a peripherally inserted central catheter (PICC) and Medline; (2) continuous training of healthcare professionals, particularly young staff; (3) feedback with hospitalization units; and (4) proactive surveillance of venous access manipulation and maintenance. The interventions were designed, implemented, and evaluated by the ITT and were well accepted by healthcare professionals. After the implementation of the ITT, the incidence of healthcare-associated bloodstream infections decreased. This trend was particularly relevant for parenteral nutrition catheters (episodes per 1,000 days of parenteral nutrition) (Fig. 1). **Conclusions:** The implementation of the ITT in our center has allowed us to considerably reduce the incidence of healthcare-associated bloodstream infections. From our experience, the interventions related to systematic evaluation, education, and feedback are key to obtain and maintain this improvement.

1. Riu M, et al. Incremental cost of nosocomial bacteremia according to the focus of infection and antibiotic sensitivity of the causative microorganism in a university hospital. *Medicine* (Baltimore). 2017;96(17):e6645. doi: 10.1097/MD.0000000000006645.

Funding: None

Disclosures: Carlota Hidalgo-Lopez reports that this study was partly funded by Diversey. The authors did not receive direct **Funding:** from the sponsor, Juan Pablo Horcajada reports consulting fees from MSD, Pfizerand, and Menarini, as well as speaker fees from MSD, Pfizer, and Zambon.

Doi:10.1017/ice.2020.1129

Figure 1. Incidence rate of healthcare-associated bloodstream infections before and after the implementation of implementation of the intravascular therapy team (ITT) in a University Hospital in Barcelona, Spain

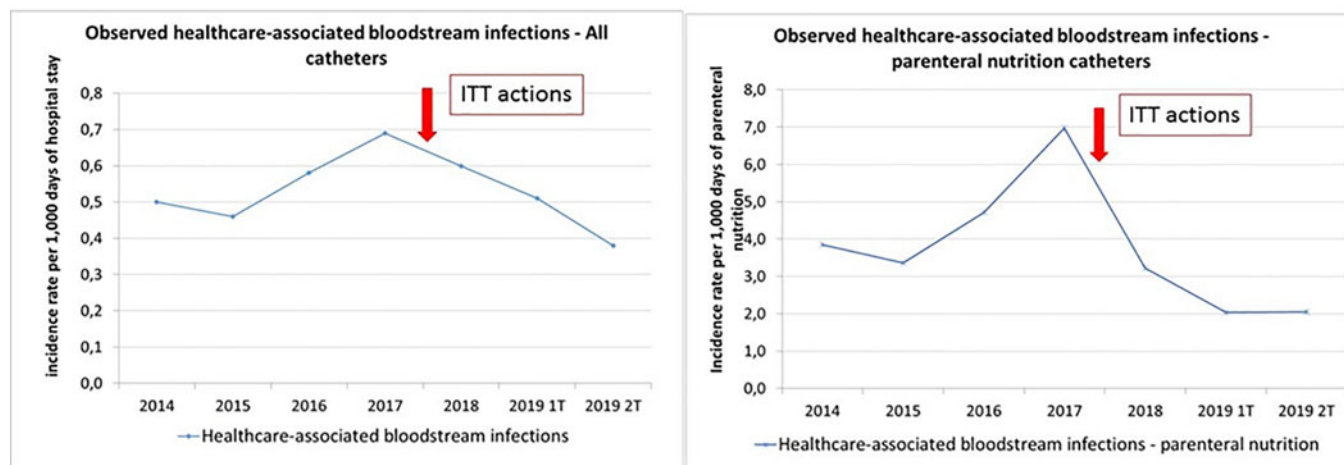


Fig. 1