Presentation Type:
Poster Presentation

Timing and Route of Contamination of Patient Rooms With Healthcare-Associated Pathogens

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Background: Transmission of healthcare-associated pathogens such as *Clostridioides difficile* and methicillin-resistant *Staphylococcus aureus* (MRSA) is a persistent problem in healthcare facilities despite current control measures. A better understanding of the routes of pathogen transmission is needed to develop effective control measures. **Methods**: We conducted an observational cohort study in an acute-care hospital to identify the timing and route of transfer of pathogens to rooms of newly admitted patients with negative MRSA nares results and no known carriage of other healthcare-associated pathogens. Rooms were thoroughly cleaned and disinfected prior to patient admission. Interactions of patients with personnel and portable equipment were observed, and serial cultures for pathogens were collected from the skin of patients and from surfaces, including those observed to come in contact with personnel and equipment. For MRSA, spa typing was used to determine relatedness of patient and environmental isolates. **Results:** For the 17 patients enrolled, 1 or more environmental cultures became positive for MRSA in rooms of 10 patients (59%), for *C. difficile* in rooms of 2 patients (12%) and for vancomycin-resistant enterococci (VRE) in rooms of 2 patients (12%). The patients interacted with an average of 2.4 personnel and 0.6 portable devices per hour of observation. As shown in Figure 1, MRSA contamination of the floor occurred rapidly as personnel entered the room. In a subset of patients, MRSA was subsequently recovered from patients' socks and bedding and ultimately from the high-touch surfaces in the room (tray table, call button, bedrail). For several patients, MRSA isolates recovered from the floor had the same spa type as isolates subsequently recovered from other sites (eg, socks, bedding, and/or high touch surfaces). The direct transfer of healthcare-associated pathogens from personnel or equipment to high-touch surfaces was not detected. **Conclusions:** Healthcare-associated pathogens rapidly accumulate on the floor of patient rooms and can be transferred to the socks and bedding of patients and to high-touch surfaces. Healthcare facility floors may be an underappreciated source of pathogen dissemination not addressed by current infection control measures.

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To Err is Human, To Forget is Device-related: A Cautionary Note for Endoscopists

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Background: In the United States, ~5 million endoscopies are performed annually. Contaminated endoscopes account for more nosocomial infections than any other medical device, but the vast majority of such events go unreported. We found no reports in the literature or the FDA Manufacturer and User Facility Device Experience (MAUDE) database of the incident described below. **Methods:** During a colonoscopy, the operator noticed resistance while advancing a clipping wire through the channel. A balloon-tipped catheter sheath was then extruded into the colonic lumen. The sheath and endoscope were withdrawn without incident, and the procedure was completed with a different endoscope. According to equipment logs, the last time that type of balloon-tipped catheter was used occurred 20 days prior, resulting in 20 patients having potentially been exposed to an incompletely disinfected device. Interrogation of the endoscope with various inserts revealed that the presence of a retained sheath would allow passage of all types of guide wires, (snips, snares, etc), including the cleaning brush. The only device whose passage would have been prevented by a retained sheath was a vascular clipping device. A review of procedure notes and interviews of involved physicians revealed that such clippings were performed as recently as 2 days prior to the incident, thus reducing the number of potentially exposed to 2, plus the index. The county and state health departments were notified, a MAUDE report was filed, and patients were notified and offered free testing for bloodborne and enteric pathogens. **Discussion:** The root causes of the exposure included the absence of a closed-loop feedback for removable components

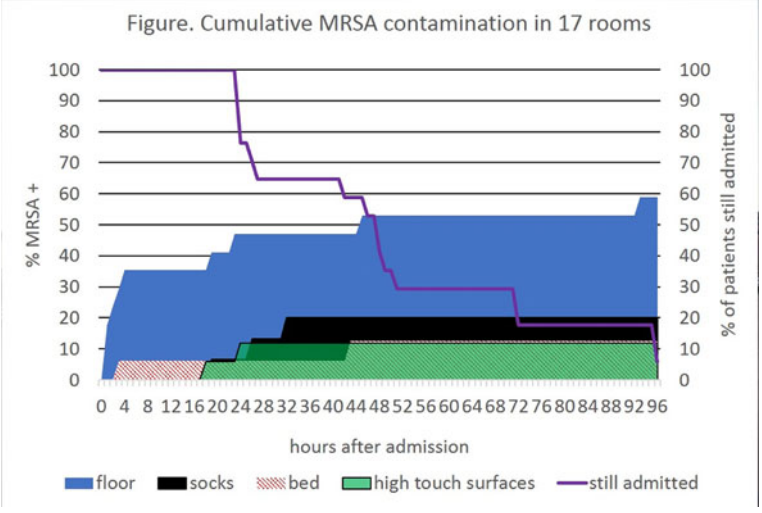

Fig. 1.

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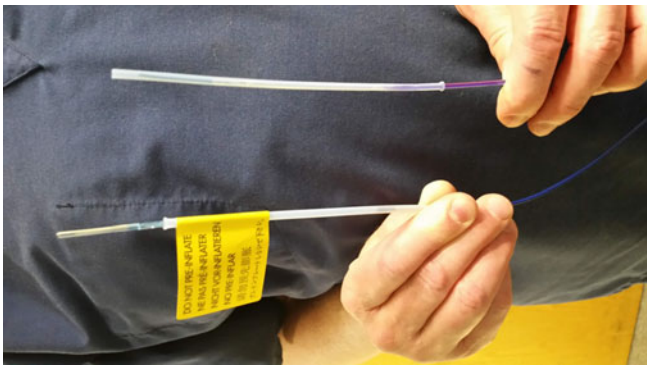

Fig. 2.

(similar to an operating room sponge count), an inexperienced endoscopy technologist, and, in our opinion, a design flaw of the sheath that allows the sheath to enter the channel. Specifically, unlike other sheath brands, this brand lacks a large, irremovable warning flag that precludes channel entry (Fig. 1). Had we not been able to trace the use of each individual endoscope (n = 45) in the clinic and link each to specific patients, procedures, and reprocessing logs, we would have had no way to determine the extent of exposures. This incident, which we present as a cautionary tail to others, highlights (1) a possible equipment design flaw, (2) the importance of closed-loop feedbacks for removable components, (3) the criticality of detailed procedure notes along with granular cleaning and reprocessing logs traceable to every endoscope, and (4) the challenge of communicating risk of disease transmission to patients.

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Toward a Change Among the Epidemiology of Catheter-Related Bloodstream Infections in Catalonia

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Background: Catheter-related bloodstream infections (CRBSIs) are one of the most frequent causes of heathcare-associated infections and an important cause of preventable death. Central venous catheters (CVC) have been considered the most worrisome origin of CRBSI. Implemented preventive measures at most hospitals and published guidelines for the prevention of vascular catheter infections have focused mostly on CVCs. However, peripherally inserted venous catheters (PIVC)–related bloodstream infections have increased in recent years and are currently among the top 10 patient safety concerns for 2019. **Objective:** We describe the changes in the epidemiology of catheter-related bloodstream infections among acute-care hospitals reporting at the VINCat program (Infection Control and Antimicrobial Stewardship Catalan Program) from 2008 to 2018. **Methods:** Data on 55 hospitals in Catalonia reporting all the episodes of CRBSI diagnosed according to standardized definitions during 2008–2018 were used for the analysis. Participating hospitals were classified into 3 groups according to size: group 1 (>500 beds), 9 hospitals; group 2 (500–200 beds), 17 hospitals; and group 3 (<200 beds), 29 hospitals. Catheters were classified in 3 categories: CVCs, PICVCs, and short peripheral venous catheters (PVCs). Rates of catheter-related bloodstream infection (CR-BSI) were obtained by adjusting the total number of episodes by 1,000 hospital stays. Simple linear regressions were performed. Values of $P \leq .05$ were considered statistically significant. **Results:** During the study period, 8,221 nosocomial episodes of CRBSI were diagnosed among the 55 participating hospitals. In total, 37,587,967 hospital stays were counted. The CRBSI rate was 0.22 episodes per 1,000 hospital stays (group 1, 0.28; group 2, 0.15; and group 3, 0.16), following a downward trend from 2008 to 2018 from 0.28 to 0.21 per 1,000 hospital stays ($P < .005$). Among them, CVC-BSI showed a downward trend (from 610 annual episodes in 2008 to 312 in 2018), and PICVC and PVC showed an upward trend (from 51 and 120 annual episodes in 2008 to 130 and 312 in 2018, respectively). Annual rates of PICVCs and PVCs showed an upward trend, but CVCs showed a downward trend in 2018 ($P < .05$): 0.09 per 1,000 hospital stays for PICVCs; 0.07 per 1,000 hospital stays for PVCs, and 0.04 episodes per 1,000 hospital stays for CVCs (Fig. 1). **Conclusions:** PIVC-related bloodstream infections have increased in recent years, whereas bloodstream infections related to CVC have followed a downward trend. Our hospitals should implement preventive measures to specially address the prevention of PICVC infections.

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