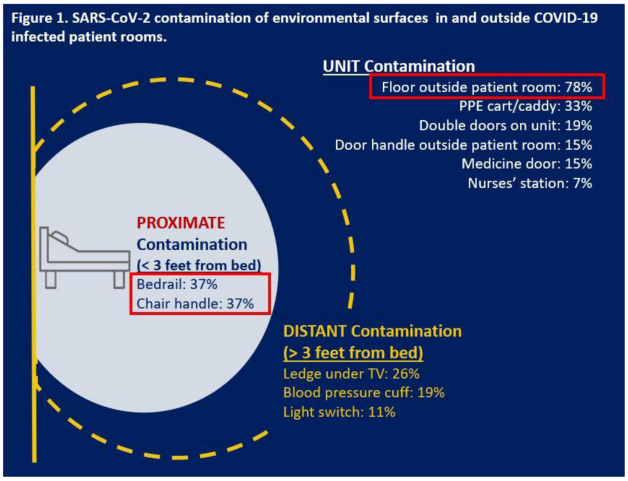

detection. **Results:** In total, 297 swabs were collected from the unit and environmental areas surrounding 27 hospitalized patients: average age, 72.5 years (range, 34–94); 100% male; 92% non-Hispanic white; average comorbidities, 1.8 (SD, 1.1). Of 297 swabs, 80 (27%) were positive for SARS-CoV-2 and 19 (70%) of 27 patients had at least 1 positive site. The most contaminated site was the floor just outside the patient room (78% positive samples), followed by the patient's bedrail (37%) and chair handle (37%) (Fig. 1). Traditionally high-touch surfaces, such as the door handle (outside patient room) and the light switch, did not have high positivity rates (<15%). Interestingly, both the personal protective equipment (PPE) cart outside patient's room (33%) and the double doors leading out of the unit (19%) were positive, which are surfaces often touched with bare hands after handwashing. Analyses of clinical data are underway to examine whether specific care needs, based on activities of daily living disability, comorbidities, and clinical presentation of COVID-19, predict SARS-CoV-2 environmental contamination. **Conclusions:** The presence of environmental contamination by SARS-CoV-2 highlights the importance of transmission via direct or indirect contact. Studies targeting high-risk populations are needed to better understand the transmission of SARS-CoV-2 between infected patients and their environment. Our findings also suggest that handwashing and attention to using disinfecting wipes may mitigate the risk of transmission of virus from surfaces that one might consider safe to touch.

Funding: None
Disclosures: None

Antimicrobial Stewardship & Healthcare Epidemiology 2022;2(Suppl. S1):s76–s77
doi:10.1017/ash.2022.202

Presentation Type:
Poster Presentation - Oral Presentation
Subject Category: COVID-19

RNA and viable SARS-CoV-2 contamination of emergency department surfaces and association with patient COVID-19 status and aerosol procedures

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Background: Aerosol-generating procedures (AGPs) performed on COVID-19–positive patients raise concerns about the dissemination of SARS-CoV-2 via aerosols and droplets. Infectious aerosols and droplets generated by SARS-CoV-2–positive patient AGPs or through direct COVID-19 patient coughing or exhalation could potentially contaminate surfaces, leading to the indirect spread of SARS-CoV-2 via fomites within the emergency department (ED). We sampled surfaces of ED patient rooms occupied by known SARS-CoV-2–positive patients or patients under investigation for COVID-19 and undergoing an AGP to determine the frequency of room contamination with SARS-CoV-2 RNA. **Methods:** Swabs were collected from 5 room surfaces in the ED following AGPs performed on patients under investigation for COVID-19 or positive for SARS-CoV-2. High- and low-touch surfaces 6 feet (2 m) from the patient (door handle and return vent, respectively) and reusable medical equipment were swabbed. Swabs were tested for SARS-CoV-2 RNA by RT-qPCR; positive samples were cultured in Vero E6 cells. Patient COVID-19 results were confirmed through the electronic medical record. **Results:** In total, 203 rooms were sampled: 43 SARS-CoV-2–positive patients with an AGP, 44 SARS-CoV-2–positive patients who did not have an AGP, and 116 SARS-CoV-2–negative patients with an AGP, for a total of 1,015 swabs. Overall, SARS-CoV-2 RNA was detected on 36 (3.5%) surfaces from 29 rooms (14.3%) (Table 1). RNA contamination was detected more frequently in rooms occupied by SARS-CoV-2–positive patients who did not have an AGP than rooms occupied by COVID-19 patients (30% vs 14%). SARS-CoV-2 RNA was also detected in rooms occupied by SARS-CoV-2–negative patients undergoing an AGP (9%). SARS-CoV-2 RNA was most frequently detected on air vents (n = 15), bedrails (n = 10), equipment and vital signs monitors (n = 4 each), and door handles (n = 3). One bedrail was positive by culture and confirmed by an RT-qPCR cycle threshold reduction from >40 to 13. **Conclusions:** We detected SARS-CoV-2 RNA contamination on room surfaces in the ED, regardless of patient AGP or COVID-19 status; however, RNA contamination of room surfaces was most common in rooms occupied by SARS-CoV-2–positive patients who did not have an AGP, which may be attributable to stage of disease and viral shedding. SARS-CoV-2 RNA contamination was also present in rooms where APGs were performed on SARS-CoV-2–negative patients, suggesting carryover from previous patients. SARS-CoV-2 RNA was found most often on room air-return vents, further emphasizing the importance of aerosols in the spread of SARS-CoV-2.

Table 1. Percentage of rooms and surface swabs testing positive for SARS-CoV-2 RNA by RT-qPCR or culture

Patient COVID status	AGP	Number of rooms sampled	Percentage of rooms positive for SARS-CoV-2 RNA	Number of swabs collected	Percentage of swabs positive for SARS-CoV-2 RNA	Number of swabs positive by culture
COVID-positive	Yes	43	14%	215	5%	0
COVID-positive	No	44	30%	220	7%	1
COVID-negative	Yes	116	9%	580	2%	0

Funding: None
Disclosures: None

Antimicrobial Stewardship & Healthcare Epidemiology 2022;2(Suppl. S1):s77
doi:10.1017/ash.2022.203

Presentation Type:
Poster Presentation - Oral Presentation
Subject Category: COVID-19

Candidemia before and after the COVID-19 pandemic: An analysis of risk factors and outcomes in patients with candidemia

Nora Colburn; Courtney Nichols; Mark Lustberg; Shandra Day; Michael Haden and Christina Liscynesky

Background: An increase in candidemia has been observed throughout the world since the start of the COVID-19 pandemic. Patients with COVID-19 may have different risk factors, clinical presentations, and outcomes compared to patients without COVID-19. **Methods:** We conducted a retrospective chart review of all inpatients with candidemia at a large, academic medical center from April 30, 2019, to February 19, 2021. The first case of COVID-19 was detected at our institution March 2020 and patients were sorted into pre– versus post–COVID-19 pandemic groups. Data regarding clinical characteristics, risk factors, and outcomes were collected. The rate of candidemia per 10,000 patient days was calculated from January 2013 through February 2021. **Results:** In total, 202 patients were identified with candidemia: 92 cases were identified before the pandemic

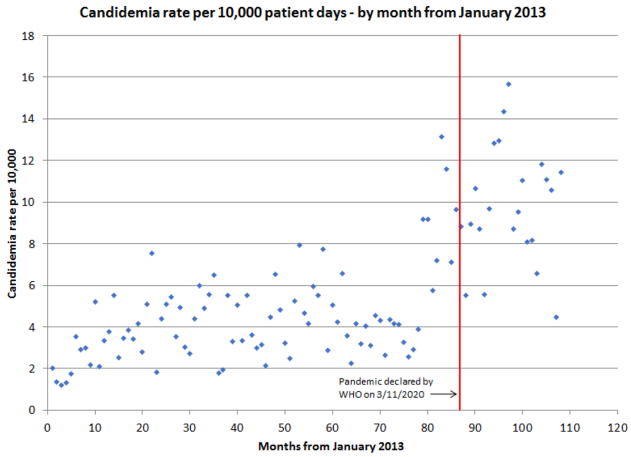

Fig. 1.

and 110 cases were identified after the pandemic began. Moreover, 33 (16.3%) patients were diagnosed with COVID-19 during the admission and 169 (83.7%) did not have COVID-19. Patients with COVID-19 were significantly more likely to be older (median, 64.5 vs 54.8 years; $P = .0006$) and to have a higher body mass index (32.8 vs 29.1; $P = .03$) than patients without COVID-19. Patients with COVID-19 were less likely have some of the traditional risk factors (eg, abdominal surgery, total parenteral nutrition, history of injecting drugs) for candidemia compared to patients without COVID-19. Patients with COVID-19 were significantly more likely to require ICU care (97.0% vs 67.5%; $P < .001$) and to require mechanical ventilation (90.9% vs 53.9%; $P < .001$), and they had higher mortality at 30 days (66.7% vs 31.4%; $P < .001$). A multivariate logistic regression model showed that COVID-19 (OR, 2.53; 95% CI, 1.09–5.90) and higher age (OR 1.45, 95% CI, 1.11–1.91) were significant predictors of 30 day mortality. Using a Poisson regression model, the incidence rate ratio for candidemia per month after the start of the COVID-19 pandemic was 2.09 (95% CI, 1.85–2.36; $P < .0001$) compared to the years prior. **Conclusions:** Rates of candidemia significantly increased after the start of the COVID-19 pandemic. Patients with candidemia in the post–COVID-19 era tend to have nontraditional risk factors, to be more critically ill, and to have increased mortality compared to patients in the pre–COVID-19 era. COVID-19 and higher age were independent predictors of mortality. More studies are needed to further define risk factors for candidemia in patients with COVID-19.

Funding: None
Disclosures: None

Antimicrobial Stewardship & Healthcare Epidemiology 2022;2(Suppl. S1):s77–s78
doi:10.1017/ash.2022.204

Presentation Type:
Poster Presentation - Oral Presentation
Subject Category: Environmental Cleaning

Multicenter evaluation of contamination of the healthcare environment near patients with *Candida auris* skin colonization

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Background: *Candida auris* is an emerging multidrug-resistant yeast that is transmitted in healthcare facilities and is associated with substantial morbidity and mortality. Environmental contamination is suspected to play an important role in transmission but additional information is needed to inform environmental cleaning recommendations to prevent spread. **Methods:** We conducted a multiregional (Chicago, IL; Irvine, CA) prospective study of environmental contamination associated with *C. auris* colonization of patients and residents of 4 long-term care facilities and 1 acute-care hospital. Participants were identified by screening or clinical cultures. Samples were collected from participants' body sites (eg, nares, axillae, inguinal creases, palms and fingertips, and perianal skin) and their environment before room cleaning. Daily room cleaning and disinfection by facility environmental service workers was followed by targeted cleaning of high-touch surfaces by research staff using hydrogen peroxide wipes (see EPA-approved product for *C. auris*, List P). Samples were collected immediately after cleaning from high-touch surfaces and repeated at 4-hour intervals up to 12 hours. A pilot phase (n = 12 patients) was conducted to identify the value of testing specific high-touch surfaces to assess environmental contamination. High-yield surfaces were included in the full evaluation phase (n = 20 patients) (Fig. 1). Samples were submitted for semiquantitative culture of *C. auris* and other multidrug-resistant organisms (MDROs) including methicillin-resistant *Staphylococcus aureus* (MRSA), vancomycin-resistant *Enterococcus* (VRE), extended-spectrum β-lactamase–producing Enterobacterales (ESBLs), and carbapenem-resistant Enterobacterales (CRE). Times to room surface contamination with *C. auris* and other MDROs after effective cleaning were analyzed. **Results:** *Candida auris* colonization was most frequently detected in the nares (72%) and palms and fingertips (72%). Cocolonization of body sites with other MDROs was common (Fig. 2). Surfaces located close to the patient were commonly recontaminated with *C. auris* by 4 hours after cleaning, including the overbed table (24%), bed handrail (24%), and TV remote or call button (19%). Environmental cocontamination was more common with resistant gram-positive organisms (MRSA and, VRE) than resistant gram-negative organisms (Fig. 3). *C. auris* was rarely detected on surfaces located outside a patient's room (1 of 120 swabs; <1%). **Conclusions:** Environmental surfaces near *C. auris*–colonized patients were rapidly recontaminated after cleaning and disinfection. Cocolonization of skin and environment with other MDROs was common, with resistant

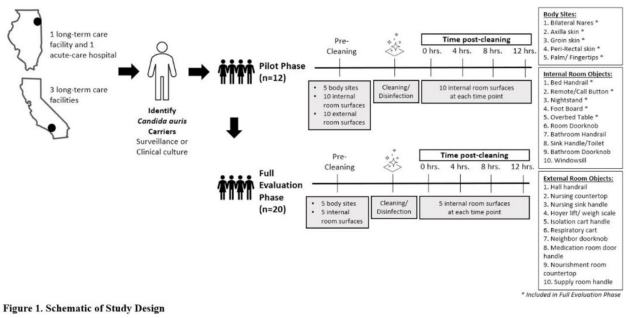

Figure 1. Schematic of Study Design

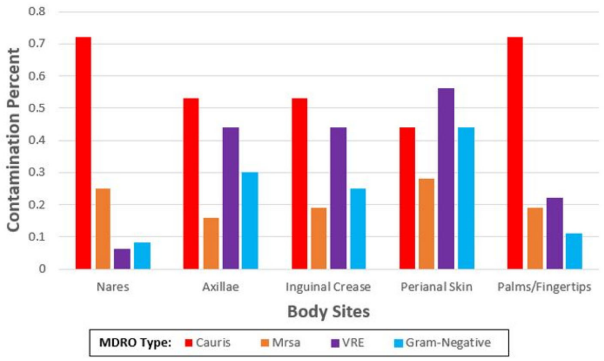

Figure 2. Body site colonization with *Candida auris* and other multidrug-resistant organisms (MDROs)