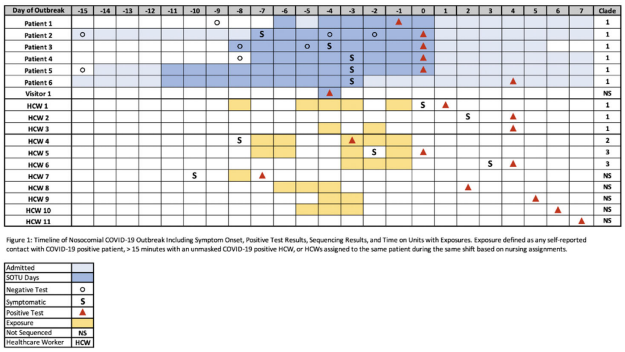
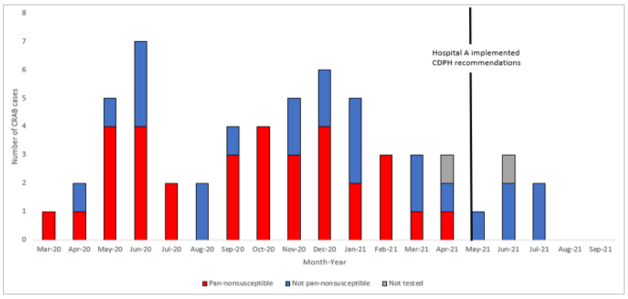


Figure 1: Timeline of Nosocomial COVID-19 Outbreak Including Symptom Onset, Positive Test Results, Sequencing Results, and Time on Units with Exposures. Exposure defined as any self-reported contact with COVID-19 positive patient, > 15 minutes with an unmasked COVID-19 positive HCW, or HCWs assigned to the same patient during the same shift based on nursing assignments.

Figure 1. Carbapenem-resistant *Acinetobacter baumanii* cases at Hospital A by susceptibility during March 18, 2020–September 30, 2021



4 patients had severe liver disease, including 2 with liver transplants. All HCWs and half of the patients had received 2 doses of mRNA vaccine, albeit >5 months from their second vaccination. Whole-genome sequencing confirmed patients 1–6 and HCWs 1–3 had related transmission of COVID-19. However, infections in HCWs 4–6, who worked in a transplant-related office setting without patient contact, were due to 2 separate introductions of SARS-CoV-2 unrelated to the hospital outbreak. Sequencing could not be performed on HCWs 7–11 due to low viral concentration in the original specimens or unavailable specimen. The SARS-CoV-2 δ (delta) variant (B.1.617.2) was identified in all sequenced samples. HCWs 8–10 were asymptomatic and had had contact with each other and had been involved with an intubation without proper PPE for SARS-CoV-2 on patient 6. HCW 8 had had contact with all 6 patients and HCW 9 had had contact with 5 patients. A clear index case could not be identified; however, we suspect that the index case was either visitor 1, who tested positive during patient 2's admission, or an asymptomatic healthcare worker (HCWs 8–10). **Conclusions:** We identified a nosocomial outbreak of the SARS-CoV-2 δ (delta) variant in a solid-organ transplant unit including patients, a visitor, and vaccinated healthcare workers with multiple introductions of the virus. Further transmission was not detected after enhanced infection control measures were introduced, including universal masking and eye protection, closing patient doors, and enforcement of visitor masking policy. We describe the difficulties tracing SARS-CoV-2 transmission in the hospital setting, even with advanced sequencing techniques. This outbreak highlights the importance of booster vaccination and strict infection control practices, especially in the setting of the δ (delta) variant.

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Presentation Type:
Poster Presentation - Oral Presentation
Subject Category: Outbreaks

Outbreak investigation of CRAB at an acute-care hospital ICU during the COVID-19 pandemic—Chicago, Illinois, March 2020–September 2021

Hira Adil; Kelly Walblay; Shelby Daniel-Wayman; Massimo Pacilli; Shannon Xydis; Christine Pate; Ann Valley and Stephanie Black

Background: Carbapenem-resistant *Acinetobacter baumannii* (CRAB) is primarily associated with hospital-acquired infections and is an urgent public health threat due to its ability to contaminate the environment and cause severe disease. In 2019, Illinois began pilot surveillance for CRAB requiring select laboratories to submit specimens for molecular characterization. On July 17, 2020, the Chicago Department of Public Health (CDPH) was notified of an increase in CRAB infections in a 20-bed ICU at an acute-care hospital in Chicago (hospital A) during the initial COVID-19 surge. We summarize the outbreak investigation findings and infection control recommendations. **Methods:** Clinical cultures were collected from patients in hospital A, and CRAB-positive isolates were sent to the Wisconsin State Laboratory of Hygiene for mechanism of resistance and antibiotic susceptibility testing. On-site assessments and remote follow-ups were conducted by CDPH infection preventionists to evaluate infection control practices including environmental cleaning, hand hygiene compliance, and use of personal protective equipment (PPE). The Illinois Department of Public Health and CDPH summarized the testing results, facilitated a containment response, and provided recommendations for infection control. **Results:** From March 18, 2020, to September 30, 2021, 56 patients with CRAB infections were identified from hospital A, and 33 (59%) of these cases were pan-nonsusceptible. Most specimen sources were sputum (n = 30, 54%), followed by blood (n = 13, 23%), urine (n = 6, 11%) and other (n = 7, 13%). Among isolates with mechanism testing (n = 54), 45 (83%) were positive for OXA-24/40 and 9 (17%) were positive for OXA-23. Of the CRAB-positive patients, 28 (50%) were previously positive for SARS-CoV-2. To date, 25 of these patients (45%) have been discharged and 31 (55%) have died. Two onsite visits and 7 remote-assistance sessions were conducted as part of the investigation. In response to increased COVID-19 hospitalizations, hospital A moved to crisis-capacity PPE use and encountered staffing shortages, which led to compromised infection control measures. Cleaning agents (Quat disinfectant cleaner) were also found to be ineffective against CRAB and required long contact times. **Conclusions:** In response to the CRAB outbreak at hospital A, CDPH recommended that the hospital stop crisis-capacity protocols for PPE, conduct admission screening and point-prevalence testing for CRAB, implement a hand hygiene campaign, and use an EPA-registered List K product for environmental cleaning. These recommendations were implemented in May 2021, and no CRAB cases have been reported since July 2021. To reduce CRAB transmission during the pandemic, facility leadership must commit resources to educate staff on effective infection control practices including conventional use of PPE, appropriate cleaning agents, and improved hand hygiene.

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Subject Category: Patient Safety

Racial disparities in rate of central-line–associated bloodstream infections and catheter-associated urinary tract infections

Erin Gettler; Jessica Seidelman; Jay Krishnan; Naseem Alavian; Ibukun Kalu; Melissa Campbell; Sarah Lewis; Deverick Anderson and Becky Smith

Background: Racial and ethnic disparities in healthcare access, medical treatment, and outcomes have been extensively reported. However, the impact of racial and ethnic differences in patient safety, including healthcare-associated infections, has not been well described. **Methods:** We performed a retrospective review analyzing prospectively collected data on central-line–associated bloodstream infection (CLABSI) and

Table 1 Rate and Rate Ratios (RR) of Central Line-Associated Bloodstream Infections by Race and Ethnicity

Race/Ethnicity	Total CLABSIs (n)[1]	Rate[2]	RR[3]	95% CI	p-value[4]
White	179	0.85	Reference	—	<0.001
Black	145	1.08	1.27	1.02-1.58	
Hispanic/Latino	27	1.21	1.43	0.95-2.14	
Asian	5	0.76	0.89	0.37-2.17	
American Indian/Alaska Native	1	0.26	0.31	0.04-2.22	
Native Hawaiian/Pacific Islander	1	1.87	2.20	0.31-15.71	
Other	92	1.52	1.79	1.39-2.30	

[1]Total number of CLABSIs over the surveillance period by race/ethnicity.
[2]Rates of central line-associated bloodstream infection per 1000 device days.
[3]White was the reference group for RR comparisons.
[4]Overall p-value by chi-square listed with the reference group.

Table 2 Rate and Rate Ratios (RR) of Catheter-Related Urinary Tract Infections by Race and Ethnicity

Race/Ethnicity	Total CAUTIs (n)[1]	Rate[2]	RR[3]	95% CI	p-value[4]
White	101	0.89	Reference	—	0.07
Black	74	1.26	1.42	1.05-1.92	
Hispanic/Latino	8	0.87	0.97	0.47-2.00	
Asian	7	2.21	2.49	1.16-5.36	
American Indian/Alaska Native	1	0.62	0.69	0.10-4.97	
Native Hawaiian/Pacific Islander	0	0	0	0	
Other	42	1.35	1.52	1.06-2.18	

[1]Total number of CAUTIs over the surveillance period by race/ethnicity.
[2]Rates of catheter-related urinary tract infection per 1000 device days.
[3]White was the reference group for RR comparisons.
[4]Overall p-value by chi-square listed with the reference group.

catheter-associated urinary tract infection (CAUTI) rates per 1,000 device days. Data for adult patients admitted to an academic medical center between 2018 and 2021 were stratified by 7 racial and ethnic groups: non-Hispanic White, non-Hispanic Black, Hispanic/Latino, Asian, American Indian/Alaska Native, Native Hawaiian/Pacific Islander, and othe. The "other" group was composed of bi- or multiracial patients, or those for whom no data were reported. We compared the CLABSI and CAUTI rates between the different racial and ethnic groups using Poisson regression. **Results:** Compared to non-Hispanic White patients, the rate of CLABSI was significantly higher in non-Hispanic Black patients (1.27; 95% CI, 1.02–1.58; $P < .03$) and those in the "other" race category (1.79; 95% CI, 1.39–2.30; $P < .001$, respectively), and these trends increased in Hispanic/Latino patients (Table 1). Similarly, Black patients had higher rates of CAUTI (1.42; 95% CI, 1.05–1.92; $P < .02$), as did Asian patients (2.49; 95% CI, 1.16–5.36; $P < .02$), and patients in the "other" category (1.52; 95% CI, 1.06–2.18; $P < .02$) (Table 2). **Conclusions:** Racial and ethnic minorities may be vulnerable to a higher rate of patient safety events, including CLABSIs and CAUTIs. Additional analyses controlling for potential confounding factors are needed to better understand the relationship between race or ethnicity, clinical management, and healthcare-associated infections. This evaluation is essential to inform mitigation strategies and to provide optimum, equitable care for all.

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Poster Presentation - Oral Presentation
Subject Category: Respiratory Viruses

Assessing alternatives to HEPA air purification requirements to reduce viral pathogen transmission in healthcare HVAC systems

Werner Bischoff; David Ornelles; Lauren Ivey and Bill Payne

Background: High-efficiency particulate air (HEPA) filters are currently recommended when using recirculated air to eliminate the risk of pathogen transmission such as SARS-CoV-2 from one patient care area to the next. We tested the efficacy of lower-grade air filters in eliminating airborne virus transmission. **Methods:** We conducted an experiment in 2 adjacent exam rooms in an unoccupied hospital emergency unit. The HVAC system contained a 15,000-cubic-feet-per-minute rooftop air handler. All outside air and exhaust dampers were closed during the trial (full air recirculation). We conducted experiments in 3 tests arms with varying grades of MERV filters (AAF Flanders, Louisville, KY): (1) control without filters, (2) MERV8+14 filters, and (3) MERV8+16 filters. We repeated 20-minute virus challenge runs 3 times per test arm. Live attenuated influenza vaccine (2 mL LAIV, FluMist Quadrivalent 2020/21, AstraZeneca, Wilmington, DE), was aerosolized into the HVAC system via a commercial nebulizer. Air was sampled using 3 six-stage Andersen air samplers placed in the center of the adjacent room. Environmental particle counts were collected using a particle counter (PEC-PCO-1, PCE Americas). **Results:** Concentrations of viral RNA were determined by qPCR, and viral concentrations (vg/mL) in each stage of each arm were compared directly. Pairwise comparisons of the virus and particle burdens across each stage of each test arm were made using a general linear model. LAIV was detected in the control arm at a virus burden of 2,277 vg/mL, indicating a >6.5 log reduction of the virus released in the HVAC system (8.8×109 total vg). In the second arm, the MERV8+MERV14 filters demonstrated in a 13-fold decrease in viral burden compared to the control arm (mean virus burden: 169 vg/mL, p Our study demonstrates that viral containing particles can be transported via a hospital HVAC system from one patient room to the next. Considering the decrease in detectable virus within the HVAC system, the combination of MERV8+MERV16 filters reduced the virus burden reaching an adjacent room to levels well below the human infectious dosages for influenza and other highly infective viruses. **Conclusions:** Our findings indicate that MERV8+MERV16 filters provide protection against virus transmission through HVAC systems and are a cost-conscious alternative to HEPA filters.

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Subject Category: Respiratory Viruses

Clinical factors associated with antibiotic de-escalation after a positive multiplex molecular respiratory panel

Jonathan Baghdadi; Daniel Morgan; Anthony Harris and Katherine Goodman

Background: Under ideal circumstances, multiplex molecular respiratory panels can support early all discontinuation of unnecessary antibiotics by facilitating diagnosis of viral infection. Our goal was to identify clinic situations in which a positive respiratory panel was associated with antibiotic de-escalation. We focused on gram-negative antibiotics in recognition of the urgent threat posed by gram-negative resistance. **Methods:** The sample included hospitalized adults tested by respiratory panel while receiving gram-negative antibiotics at the University of Maryland Medical Center from 2015 to 2020. Only the first respiratory panel performed during hospitalization was included. The primary outcome was the combination of a positive result on respiratory panel indicating detection of a viral pathogen and de-escalation of gram-negative antibiotics. De-escalation was assessed