

Table 1.

Infection†	Pre-Pandemic‡			Pandemic‡		
	Facilities‡	Incidence‡	95%CI‡	Facilities‡	Incidence‡	95%CI‡
CDI‡	398‡	0.59*‡	0.57-0.62‡	382‡	0.56*‡	0.54-0.59‡
MRSA-BSI‡	398‡	0.73*‡	0.66-0.82‡	382‡	0.82*‡	0.73-0.92‡
VRE-BSI‡	397‡	2.51†‡	2.18-2.89‡	383‡	3.53†‡	3.11-4.01‡

* → Standardized-infection-ratio¶

† → Infections-per-100,000-patient-days.¶

use and reuse) or overuse with multiple gown and glove layers, and antimicrobial prescribing changes during the COVID-19 pandemic might increase healthcare-associated infection (HAI) incidence and antimicrobial resistance. We compared the incidences of *Clostridioides difficile* infection (CDI), methicillin-resistant *Staphylococcus aureus* bloodstream infection (MRSA BSI), and vancomycin-resistant enterococci bloodstream infection (VRE BSI) reported by California hospitals during the COVID-19 pandemic with incidence data collected prior to the pandemic. **Methods:** Using data reported by hospitals to the California Department of Health via the NHSN, we compared incidences in the second and third quarters of 2020 (pandemic) to the second and third quarters of 2019 (before the pandemic). For CDI and MRSA BSI, we compared the standardized infection ratios (SIRs, based on the 2015 national baseline), and we calculated the *P* values. No adjustment model is available for VRE BSI; thus, we measured incidence via crude incidence rates (infections per 100,000 patient days). We calculated incidence rate ratio (IRR) with 95% CI for VRE BSI. To examine the possible effect of missing data during the pandemic, we performed a sensitivity analysis by excluding all facilities that had incomplete data reporting at any time during either analysis period. **Results:** Incidence measures and numbers of facilities contributing data in pre-pandemic and pandemic periods are shown in Table 1. There were no statistically significant changes in SIRs at *P* = .05 for either MRSA BSI or CDI between the pre-pandemic and pandemic periods (MRSA BSI *P* = .17; CDI *P* = .08). Crude VRE BSI incidence increased during the pandemic compared to the pre-pandemic period (IRR, 1.40; 95% CI, 1.16–1.70). Excluding facilities with incomplete data had minimal effect. **Conclusions:** We found insufficient evidence that MRSA BSI or CDI incidence changed in California hospitals during the pandemic relative to the pre-pandemic period; however, there was a significant increase in the crude incidence of VRE BSI. Next, we will include interrupted time series analyses to assess departure from long-term trends, including a risk-adjusted model for VRE BSI. Additionally, we will evaluate for changes in central-line-associated bloodstream infection incidence and antimicrobial resistance among HAI pathogens.

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Subject Category: COVID-19**Secondary Bacterial Pneumonias and Bloodstream Infections in Patients Hospitalized with COVID-19**

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Group Name: The Emory COVID-19 Quality and Clinical Research Collaborative

Background: Patients hospitalized with COVID-19 are at risk of secondary infections—10%–33% develop bacterial pneumonia and 2%–6% develop bloodstream infection (BSI). We conducted a retrospective cohort study to identify the prevalence, microbiology, and outcomes of secondary pneumonias and BSIs in patients hospitalized with COVID-19. **Methods:** Patients aged ≥18 years with a positive SARS-CoV-2 real-time polymerase chain reaction assay admitted to 4 academic hospitals in Atlanta, Georgia, between February 15 and May 16, 2020, were included. We extracted electronic medical record data through June 16, 2020. Microbiology tests were performed according to standard protocols. Possible ventilator-associated pneumonia (PVAP) was defined according to Centers for Disease Control and

Prevention (CDC) criteria. We assessed in-hospital mortality, comparing patients with and without infections using the χ^2 test. SAS University Edition software was used for data analyses. **Results:** In total, 774 patients were included (median age, 62 years; 49.7% female; 66.6% black). In total, 335 patients (43.3%) required intensive care unit (ICU) admission, 238 (30.7%) required mechanical ventilation, and 120 (15.5%) died. Among 238 intubated patients, 65 (27.3%) had a positive respiratory culture, including 15 with multiple potential pathogens, for a total of 84 potential pathogens. The most common organisms were *Staphylococcus aureus* (29 of 84; 34.5%), *Pseudomonas aeruginosa* (16 of 84; 19.0%), and *Klebsiella* spp (14 of 84; 16.7%). Mortality did not differ between intubated patients with and without a positive respiratory culture (41.5% vs 35.3%; *P* = .37). Also, 5 patients (2.1%) had a CDC-defined PVAP (1.7 PVAPs per 1,000 ventilator days); none of them died. Among 536 (69.3%) nonintubated patients, 2 (0.4%) had a positive *Legionella* urine antigen and 1 had a positive respiratory culture (for *S. aureus*). Of 774 patients, 36 (4.7%) had BSI, including 5 with polymicrobial BSI (42 isolates total). Most BSIs (24 of 36; 66.7%) had ICU onset. The most common organisms were *S. aureus* (7 of 42; 16.7%), *Candida* spp (7 of 42; 16.7%), and coagulase-negative staphylococci (5 of 42; 11.9%); 12 (28.6%) were gram-negative. The most common source was central-line-associated BSI (17 of 36; 47.2%), followed by skin (6 of 36; 16.7%), lungs (5 of 36; 13.9%), and urine (4 of 36; 11.1%). Mortality was 50% in patients with BSI versus 13.8% without (*p* < 0.0001). **Conclusions:** In a large cohort of patients hospitalized with COVID-19, secondary infections were rare: 2% bacterial pneumonia and 5% BSI. The risk factors for these infections (intubation and central lines, respectively) and causative pathogens reflect healthcare delivery and not a COVID-19-specific effect. Clinicians should adhere to standard best practices for preventing and empirically treating secondary infections in patients hospitalized with COVID-19.

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Subject Category: COVID-19**COVID-19 Contact Tracing in a Pediatric Hospital: Maximizing Effectiveness Through Specialized Team and Automated Tools**

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Background: In their interim infection prevention and control recommendations for the coronavirus disease 2019 (COVID-19) pandemic, the Centers for Disease Control and Prevention (CDC) recommend that healthcare facilities have a plan to identify, investigate, and trace potential COVID-19 exposures. In an academic hospital, the scale of such tracing is substantial, given that medically complex patients can have dozens of staff contacts across multiple locations during an encounter. Furthermore, the family-centered care model employed by pediatric institutions precludes visitor exclusion, further complicating tracing efforts. Despite this complexity, tracing accuracy and timeliness is of paramount importance for exposure management. To address these challenges, our institution developed a contact-tracing system that balanced expert participation with automated tracing tools. **Methods:** Our institution's contact-tracing initiative includes positive patients, parents and/or visitors, and staff for the enterprise's inpatient, procedural, and ambulatory locations at the main campus and 4 satellites. The team consists of 11 staff and is overseen by an infection preventionist. For positive patients and parents and/or visitors, potentially exposed staff are automatically identified via a report that extracts staff details for all encounters occurring during the patient's infectious period. For positive staff, trained contact tracers call the staff member to determine whether mask and distancing practices could result in others meeting CDC exposure criteria. Any potentially exposed healthcare workers (HCWs) receive an e-mail that details exposure criteria and provides follow-up instructions. These HCWs are also entered into a secure, centralized tracking database that (1) allows infection prevention and occupational

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health staff to query and identify all epidemiologic links between traced patients, parents and/or visitors, and staff, and (2) initiates staff enrollment in a twice-daily symptom tracking system administered via REDCap. Potentially exposed patients and parents and/or visitors are contacted directly by a hospital representative. The contact tracing team, infection prevention staff, and occupational health staff meet daily to review positive staff cases in the last 24 hours. **Results:** To date, the team has traced ~1,300 patients, 15 parents and/or visitors, and 700 staff. Since the start of the pandemic, tracing and contact notification for all positive cases has been conducted within 24 hours. Through these proactive tracing efforts and other institutional infection prevention initiatives, the institution only experienced 1 staff cluster ($N < 15$) and < 5 hospital-onset patient cases. **Conclusions:** Equipping a trained group of contact tracers with automated tracking tools can afford infection prevention and occupational health departments the ability to achieve and sustain timely and accurate contact tracing initiatives throughout a large-scale pandemic response.

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Transmission of COVID-19 on an Inpatient Hospital Prison Unit

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Background: Prison populations have been disproportionately affected by COVID-19, partly due to challenges related to social distancing. Data on viral transmission dynamics in inpatient prison units remain limited. The Ohio State University Wexner Medical Center (OSUWMC) has a 24-bed inpatient prison unit in collaboration with the Ohio Department of Rehabilitations and Corrections (ODRC). The unit has 5 shared rooms holding 4 patients each and 4 single-patient rooms. Several cases of inpatient transmission of COVID-19 were identified on the inpatient prison unit. **Methods:** An IRB-approved retrospective chart review was conducted to evaluate inpatient transmission dynamics of hospital-acquired (HCA) COVID-19. All ODRC patients admitted from March 1 to April 24, 2020, were included. Patients assigned to the prison unit during their hospital stay were evaluated for potential HCA COVID-19, defined as a positive SARS-CoV-2 test ≥ 4 days after admission. Patient characteristics, testing data, symptoms, aerosol-generating procedures (AGPs), and room assignments were reviewed. Healthcare workers (HCWs) and correction officers (COs) working on the unit who tested positive during this period were identified. **Results:** In total, 142 ODRC patients were admitted during the study period and 89% had a positive SARS-CoV-2 testing prior to or during admission. Also, 61 patients (43%) were assigned to the prison unit. Moreover, 8 patients on the unit met potential HCA COVID-19 definition with 7 linked to 3 distinct clusters. Also, 7 COs had COVID-19 (outside hospital exposure) and 5 HCWs acquired COVID-19 from patient exposure on the unit. In cluster 1, 4 patients admitted to the same room developed HCA COVID-19. A symptomatic index patient not tested on admission given an atypical presentation required CPAP and frequent nebulizer treatments. In cluster 2, 1 patient from cluster 1 was transferred to another room. The new roommate subsequently developed HCA COVID-19. In cluster 3, a symptomatic correctional officer was assigned to 2 patients in a shared room; the patients later developed HCA COVID-19. **Conclusions:** Three patient clusters of HCA COVID-19 on a prison unit were identified. Aerosol transmission potentially played a role in cluster 1. Inpatient transmission within the unit prompted updated guidance for ODRC admissions, including universal SARS-CoV-2 admission testing, excluding patients requiring AGPs from shared rooms, and preemptive isolation for patients from an ODRC facility experiencing a COVID-19 surge. Universal testing was quickly expanded to all inpatient admissions. HCWs and COs were also linked to inpatient transmission, highlighting the importance of strict infection control practices for patient populations who cannot socially distance.

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Building a PPE Monitor Team as Part of a Comprehensive COVID-19 Prevention Strategy

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Background: The use of personal protective equipment (PPE) is a critical intervention in preventing the spread of transmission-based infections in healthcare settings. However, contamination of the skin and clothing of healthcare personnel (HCP) frequently occurs during the doffing of PPE. In fact, nearly 40% of HCP make errors while doffing their PPE, causing them to contaminate themselves. PPE monitors are staff that help to promote their colleagues' safety by guiding them through the PPE donning and doffing processes. With the advent of the COVID-19 pandemic in early 2020, the UNC Medical Center chose to incorporate PPE monitors as part of its comprehensive COVID-19 prevention strategy, using them in inpatient areas (including COVID-19 containment units and all other units with known or suspected SARS-CoV-2-positive patients), procedural areas, and outpatient clinics. **Methods:** Infection prevention and nursing developed a PPE monitoring team using redeployed staff from outpatient clinics and inpatient areas temporarily closed because of the pandemic. Employee training took place online and included fundamentals of disease transmission, hand hygiene basics, COVID-19 policies and signage, and videos on proper donning and doffing, including coaching tips. The monitors' first shifts were supervised by experienced monitors to continue in-place training. Employees had competency sheets signed off by a supervisor. **Results:** The Medical Center's nursing house supervisors took over management and deployment of the PPE monitoring team, and infection prevention staff continued to train new members. Eventually, as closed clinics and areas reopened and these PPE monitors returned to their regular positions, areas used their own staff to perform the role of PPE monitor. In the fall of 2020, a facility-wide survey was sent to all inpatient staff to assess their perceptions of the Medical Center's efforts to protect them from acquiring COVID-19. It included a question asking how much staff agreed or disagreed that PPE monitors "play an important role in keeping our staff who care for COVID-19 patients safe." Of the 626 staff who answered this question, 67.6% agreed or strongly agreed that PPE monitors played an important role in keeping staff safe. Thus far, there has been no direct transmission or clusters of COVID-19 involving HCP in COVID-19 containment units with PPE monitors. **Conclusions:** PPE monitors are an important part of a comprehensive COVID-19 prevention strategy. In early 2021, the UNC Medical Center posted and hired paid PPE monitor positions to continue this critical work in a sustainable way.

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The COVID-19 Pandemic and Antibiotic Use on the United States-Mexico Border

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Background: The US-Mexico border represents a unique region of the country where antibiotics are more accessible and nonprescription treatment with antibiotics is deeply enculturated. Currently, both the United