

a positive wound culture from a long-term resident. **Methods:** All MDR-A isolates were matched to the patients harboring them. Their clinical, epidemiologic, and geographic histories within our facility were traced. All potentially shared characteristics between cases were evaluated closely. **Results:** In total, 5 cases were determined to be likely connected over a period of ~18 months starting December 2020. The extant isolates underwent molecular evaluation and were genetically related. Patient activity was traced by the infection prevention team to identify potential sources of transmission. Environmental sampling after standard cleaning found a common strain on a shower trolley shared by these patients. Following focused cleaning of this and other shared locations, no new related isolates have been identified from patient or environmental samples. **Conclusions:** In this case, investigation by the infection prevention team of a single multidrug-resistant organism led to identification and eradication of a potential pathogen. Despite standard cleaning processes, a likely shared fomite was identified and decontaminated, thereby preventing future infections. This case exemplifies the value of thorough epidemiologic study paired with modern molecular methods of identification.

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Subject Category: Outbreaks

Impact of respiratory syncytial virus in an open bay neonatal intensive care unit

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Background: Respiratory syncytial virus, RSV, is a respiratory virus that causes cold-like symptoms in adults. In infants and young children, RSV can cause severe illnesses such as bronchiolitis or pneumonia. We describe a successful response to a laboratory-confirmed RSV outbreak in a 21-bed open-pod neonatal intensive care unit (NICU) at a level 2 trauma hospital. **Methods:** After 2 of the 3 initial neonates were diagnosed with hospital-onset RSV, an outbreak investigation began on November 16, 2022. Following the results, testing was expanded to all neonates in the NICU. The clinical case was defined as a hospitalized neonate with laboratory confirmation of RSV by RSV antigen screen or polymerase chain reaction (PCR) detection on the Biofire respiratory panel. Outbreak resolution was determined by utilizing a viral test for the remaining positive neonates after the 2-week incubation period from the last identified positive neonate. **Results:** On day 1 of the investigation, 6 of 18 neonates were identified as positive for RSV. The initial 12 negative neonates received a prophylactic dose of palivizumab. Due to the increase in positive neonates, enhanced infection prevention and control measures were immediately implemented. These measures included the immediate closure of the NICU for new transfers, placing all positive neonates in a single-bay cohort

in the NICU, implementing contact and droplet precautions, minimizing shared staff, increasing environmental cleaning, and using dedicated equipment. With awareness of the increased community occurrence of RSV, additional measures were taken to monitor adherence to infection prevention and control measures by staff and visitors entering the NICU, including daily symptom screening. Visitation was restricted to block scheduling to monitor the number of individuals in the NICU. Once we obtained the complete conversion of the initial neonate cohort, the additional focus shifted to maintaining the enhanced precautions until all neonate laboratory tests were negative. The NICU was successfully reopened once the remaining 3 positive neonates received no growth on their viral culture. **Conclusions:** The quick and effective response from a multidisciplinary team allowed a successful intervention to mitigate the identified outbreak. This investigation highlights the importance of enhanced infection prevention and control practices during increased community spread. Future efforts focus on educating staff and visitors on appropriate measures to decrease transmission risks.

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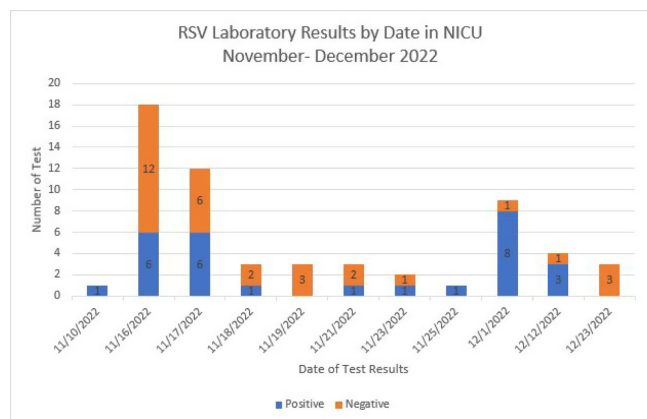
Poster Presentation - Poster Presentation

Subject Category: Outbreaks

COVID-19 outbreak in an acute psychiatric unit—Unique challenges and creative solutions

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Background: We describe the management of a major COVID-19 outbreak in January 2022 during the SARS-CoV-2 omicron-variant winter surge involving the only inpatient psychiatric facility of Santa Clara County, California, which serves a population of 1.9 million. **Methods:** On January 14, 2022, infection prevention staff were notified of a symptomatic COVID-19 case in our locked inpatient psychiatric unit who had been admitted since October 2021. The index patient had no visitors or transfers outside the unit. The patients in this unit were noncompliant with masking and mingled with each other during meals. Initial testing identified 23 positive cases among 47 patients and 12 staff cases. Mitigating actions included closing the unit to new admissions, creating alternate care areas in the emergency psychiatric unit, and separating patients into “exposed but negative” and “infected” cohorts and housing them in “red,” and “yellow” zones, respectively. A “green” zone was created by clearance of positive cases. For the cohort exposed to COVID-19, masking was enforced by supervision, dining was scheduled in batches, and daily symptom screening and antigen testing were performed in addition to standard postexposure RT-PCR testing on day 4 and day 7. Mandatory N95 respirators and eye protection were implemented for staff on unit entry. Exposed staff followed employee health protocols for postexposure testing. Enhanced environmental control measures included terminal cleaning and UV-C disinfection of common areas and patient rooms and a thorough investigation of airflow. Discharged patients were contacted if they were residing in congregate facilities. **Results:** Of 47 patients, 39 (83%) tested positive for COVID-19. However, 8 patients remained negative; all 8 had received at least their primary vaccine series (Table 1). In total, 16 HCWs were SARS-CoV-2 positive in this outbreak. The outbreak officially ended 25 days after the first case. All SARS-CoV-2–positive patients had mild illness, not requiring treatment or hospitalization. We identified vaccine immune escape, staff presenteeism, patient noncompliance with masking, and comingling as major causes of transmission. We determined through contact tracing and temporality that the outbreak likely started from a positive staff member or visitor because most patients had been long-term residents. **Conclusions:** This outbreak was challenging due to the specialized behavioral needs of the involved patients. It was imperative to reopen this unit quickly and safely to provide psychiatric care to our county’s most vulnerable patients. Ongoing PPE education, repeated reinforcement, engagement in staff wellness to combat pandemic fatigue,



Patient	VACCINE STATUS			
	Unvaccinated	Partially vaccinated	Primary series	Up-to-date
COVID +	9	6	18	6
COVID -			5	3

and aggressive vaccination are all crucial to minimizing the impact of future outbreaks.

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Subject Category: Patient Safety

Modeling methicillin-resistant *Staphylococcus aureus* (MRSA) acquisitions in the intensive care unit with different staffing levels and finite direct-care tasks

Stephanie Johnson; Matthew Mitchen and Eric Lofgren

Background: Modeling is a cost-effective way to evaluate interventions pertaining to hospital infection acquisitions, such as staffing levels. Increasing the number of nurses in an intensive care unit affects rates of HAI transmission. The way compartmental models are often formulated assumes that there is a never-ending series of tasks for workers to perform. Our previous models used a baseline of 1:3 nurse:patient ratio, and we kept the number of tasks the same across staffing ratios. We wanted to understand how having a finite number of tasks, using this baseline number, across staffing levels affected HAI acquisitions. **Methods:** We used a stochastic mathematical model of methicillin-resistant *Staphylococcus aureus* (MRSA) to study the impact of changes in staffing and a finite pool of tasks on hospital-associated acquisitions. For a 15-bed intensive care unit (ICU), we have 1 intensivist, and we set the nurse:patient ratios at 1:1, 1:1.5, 1:2.5, 1:3, 1:5, and 1:7.5, to represent the extreme ends of staffing levels and more moderate values in line with critical care society guidelines. Each model was run 1,000 times. The outcome of each scenario is the median number of hospital-associated MRSA acquisitions in 1 year from those 1,000 runs. **Results:** Treating the 1:3 nurse:patient ratio as the baseline, with 45 MRSA acquisitions per year, increasing the number of nurses from 5 to 6 (moving to a 1:2.5 nurse:patient ratio) had a relative risk (RR) of 0.77, suggesting that a small change in nurse staffing levels might have an outsized impact on rates. More dramatic changes had correspondingly larger swings in MRSA acquisition rates, with 1:1 nurse:patient ratio scenarios having an RR of 0.17, and at the other extreme, a 1:7.5 nurse:patient ratio having an RR of 4.66. Comparing the infinite to finite models, the ratios with more nurses had lower acquisition rates, with decreases ranging from 20% to 50%. Ratios with fewer nurses in the ICU showed 100%–400% increases in the number of acquisitions. All results were statistically significant. **Conclusions:** As nurse:patient ratios go up, the burden of direct-care tasks fall on fewer people, which has a direct impact on HAI rates. Our model demonstrates this hypothesis. Therefore, appropriate staffing should be considered in infection control guidelines, and the cost of staffing should be weighed against its impact on infection prevention as well as other areas of patient care. In this study, we considered only the impact from changes in contact patterns emerging from different staffing levels. Further insights may exist when considering other outcomes that also accompany increased staffing.

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Subject Category: Patient Safety

Electrifying the case review process for better speed, reach, and impact

Jennifer Gutowski; Melissa Bronstein; Adam Tatro; Stephany Frey and Emil Lesho

Background: Prevention of healthcare-associated infections (HAIs) requires timely feedback to and input from all staff involved in patient care to best identify practice gaps and improvement targets. However, multidisciplinary review of HAI events can be challenging to promptly complete given staffing shortages and the excess administrative burden of emailed and printed forms and disjointed analyses, reporting, and visualization tools. Plagued by a lack of feedback from attending and ordering physicians, difficulty transcribing and analyzing nonstandardized data, and challenges in summarizing and distributing actionable findings, we sought to reduce turnaround time (TAT), improve data collection, and broaden communication of HAI contributing factors and proposed solutions. **Methods:** A secure web application for electronic data capture and reporting, Research Electronic Data Capture (REDCap), was used; the software application is free to nonprofit organizations. The review process is now initiated by an infection preventionist entering HAI information into an initial survey, which automatically cascades information into 4 subsequent surveys, distributed through automated email links, providing an opportunity for individual responses from the nursing unit, the attending provider, an infectious disease physician, and the ordering provider for the positive test that detected the HAI. Survey questions focus on evaluation of adherence to CDC and SHEA HAI prevention strategies. Reminders are automatically generated and continue to be sent to involved staff until their portion is completed. Survey responses are automatically summarized upon completion of all reviews and are shared with several stakeholders, including hospital leadership, the care team, infection prevention staff, and quality-control partners (Fig.). Discrete qualitative and quantitative data are exported in a standard application-programming interface (API) format for immediate analysis and interpretation. **Results:** After the review process was launched using new electronic technology, the average TAT and completion rate improved from 23 days and 40% to 7 days and 95%, respectively. Input from ordering and attending physicians, once extremely rare, became frequent. Nuanced insight into causative and preventive factors, previously unachievable, occurred during review of all 38 HAIs reported in December 2022. Reviewers believed that 48% of HAIs reviewed could have been prevented. **Conclusions:** Applying electronic technology to HAI case review improved completion and timeliness of reviews by both providers and nurses. By sharing data and insights with all stakeholders in real time, the new procedure permitted multidirectional communication between the care teams and increased awareness of patient harm as well as ownership of patient safety. Our process is freely and readily generalizable to any nonprofit healthcare facility.

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