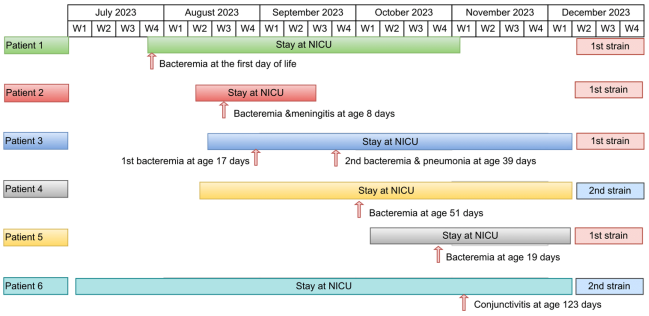

chart-review. Outbreak description and investigation: In August 2023, two NICU neonates (patients 2,3) experienced LOD two weeks apart, one with bacteremic meningitis and the other with two bacteremic episodes three weeks apart. While WGS was pending two additional cases of late-onset GBS bacteremia (patients 4,5) occurred. Isolates from Pts 2,3 and 5 were indistinguishable from each other and from an isolate from an infant admitted to the NICU with early onset bacteremia on July 27, 2023 (day 1 of life) (patient 1). Weekly point prevalence for throat and rectal colonization over 3 weeks identified five infants colonized with unrelated strains. An additional long-stay infant (patient 6) developed GBS conjunctivitis due to a strain indistinguishable from (patient 4) by pulse field gel electrophoresis, WGS for the second cluster is pending. IPAC interventions: Lapses in IPAC practices were observed, with no commonalities among cases other than similar geographic location within the unit. We hypothesized transmission was due to horizontal transmission between babies due to these lapses. Basic IPAC measures, including hand hygiene and environmental cleaning, were reinforced; Additional Precautions were not used due to private rooms' unit structure. No environmental samples were taken due to lack of an obvious environmental point or common source. Point prevalence monitoring persisted until no new cases related to the outbreak strains were further identified in three consecutive weekly point prevalence. **Conclusions:** Increased awareness of healthcare-associated transmission is crucial in NICU as LOD GBS emerges. WGS plays a key role in identifying transmission. Detecting a multi-strain outbreak can appropriately redirect investigations. Legend: Figure 1: Timeline of stay at NICU and infection timing for patients 1-6

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Outbreak of New Delhi Metallo-β-lactamase-producing Escherichia coli in a Neonatal Intensive Care Unit, New York State

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Background: Outbreaks of carbapenemase-producing (CP) organisms (CPOs), including carbapenem-resistant Enterobacterales (CRE), in neonatal intensive care units (NICUs) are not well documented. The Centers for Disease Control and Prevention (CDC) identifies CP-CRE as an urgent threat to United States (US) healthcare facilities. Wadsworth Center, the New York State (NYS) Department of Health's (NYSDOH's) public health laboratory, participates in CDC's Antimicrobial Resistance Laboratory Network to provide CPO identification, characterization, and surveillance. NYSDOH investigated an outbreak of CP-CRE Escherichia coli (E. coli) infections in NICU patients reported by one hospital. **Method:** Hospital A reported a CRE E. coli outbreak in their NICU to NYSDOH, as required by NYS Sanitary Code. In response, epidemiologists reviewed case data, conducted case finding, and provided infection control guidance to the hospital. Hospital A continued NICU clinical surveillance and conducted colonization screening to detect additional cases of CRE E. coli. The Wadsworth Center Antimicrobial Resistance Laboratory Network tested isolates from affected patients for CP genes and performed whole genome sequencing (WGS) to determine the CP gene variant, multilocus sequence type (MLST), and relatedness by mutation event (ME) analysis. NYSDOH epidemiologists assessed Hospital A's infection control practices in affected areas and provided recommendations. **Result:** Hospital A identified two CRE E. coli infections in NICU patients with overlapping admissions in June-July 2023. Retrospective surveillance identified a third CRE E. coli case in an adult medical intensive care unit patient on admission to Hospital A in June 2023, with prior hospitalization April-May 2023. WGS analysis identified the blaNDM-5 gene in all three CRE E. coli patient isolates. The two NICU patients' isolates had the same MLST (361/650) and differed by 9 MEs, indicating relatedness to each other and not the adult patient's (MLST 167/2). NICU patient colonization screening identified no additional blaNDM-5 E. coli cases. NYSDOH's NICU infection control assessment found that both cases were in adjacent isolettes within three feet of each other. Clean isolettes, equipment, and supplies for new admissions were stored in the clinical care space, not in a separate clean area. **Conclusion:** CP-CRE is an urgent threat to US healthcare facilities, including hospital NICUs. Though the incidence and prevalence of CP-CRE blaNDM-5 E. coli are not well-defined in NY, single healthcare-associated cases in NICU populations represent an outbreak. The Wadsworth Center Antimicrobial Resistance Laboratory Network's contributions complement traditional epidemiologic surveillance and investigation methods to provide more specific, comprehensive infection

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Not Your Usual Exposure: Tuberculosis Contact Investigation Related to Contaminated Bone Allograft

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Background: Mycobacterium tuberculosis transmission through contaminated bone allograft product is unusual and was first described in 2021 with a second outbreak in 2023. In July 2023, Michigan Medicine conducted contact tracing for healthcare personnel (HCP), patients, and visitors following exposure to an immunocompromised patient with surgical site infection and subsequent widely disseminated tuberculosis (bacteremia, pulmonary, lymphadenopathy) following spinal fusion with bone allograft in April 2023. The patient was in the emergency department, operating room (OR), and inpatient units for 9 days prior to initiation of Airborne Precautions (AP). **Methods:** Michigan Medicine is a 1,107 bed academic hospital. HCP are screened for tuberculosis with interferon-gamma release assay (IGRA) testing upon hire and following tuberculosis exposure. Exposure testing includes baseline IGRA testing and follow-up testing at 10-12 weeks post exposure. Exposure criteria for this investigation was defined as sharing room airspace with the tuberculosis patient prior to initiation of airborne precautions or Central Sterile Processing Department (CSPD) staff involved with instrument decontamination without the use of a respirator. Of note, universal masking with surgical masks was not required during this time for staff and patients/visitors, with the exception of CSPD and OR staff. Contact tracing was performed by Infection Prevention and Occupational Health Services managed all test results and conversions. **Results:** 176 employees from perioperative care areas (n=30), CSPD (n=7), OR (n=9) and inpatient units (n=130) were

IGRA tested. Five employee conversions were identified: one surgeon, one circulating OR nurse, two CSPD decontamination staff, and one respiratory therapist. At time of detection, none of the conversions had evidence of active tuberculosis. Additionally, 46 patients and visitors were tested with zero conversions. HCP compliance with IGRA testing was initially 15% before engagement from hospital and unit leadership and human resources. With intervention, employee compliance reached 100%. **Conclusion:** Despite standard use of surgical masks for OR and CSPD staff, aerosolization of infected bone graft material played an important role in tuberculosis transmission during surgery and instrument cleaning. Respiratory therapy practices in the ICU setting likely also increased risk for pulmonary tuberculosis transmission. Achieving 100% HCP compliance for baseline and follow-up IGRA testing is challenging and requires engagement of both unit and hospital leadership and human resources to ensure all HCP are tested.

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Implementation of the WHO IPC Ring Approach During the 2022 Uganda Sudan Ebola Virus Disease (SUDV) Response at the Epicentre
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Background: At the onset of an outbreak, immediate infection, prevention and control (IPC) measures and strategies are critically important in stopping the transmission. During the 2022 Sudan Virus Disease (SUDV) outbreak in Uganda, the IPC technical working group (TWG) adopted the WHO ring approach for intensive and targeted IPC support to interrupt transmission in high-risk areas and healthcare facilities (HCFs). Objectives: a) Leverage surveillance and epidemiological activities to guide response efforts and implement targeted IPC interventions. b) To rapidly interrupt SUDV transmission at the source through multiple IPC interventions. **Methods:** The IPC TWG delineated outbreak perimeters (rings) to include health facilities and community sites within 500 meters in urban centres and 1 kilometer in rural areas around each confirmed case. A data base with this information was developed and updated daily with information provided by the surveillance team. To activate response within 12 hours, interventions included rapid needs and risk assessments , health educational materials, deployment of decontamination teams and district IPC mentors with hygiene supplies delivered within 24 hours and a 72-hour follow-up. Trained Village Task Forces (VTF) and IPC mentors conducted health education, set up screening points, holding units, and rapid notification channels. **Results:** 56 rings including HCFs (38) and community sites (78) were identified within the radius of confirmed cases. Using the IPC scorecard, health facility mean scores significantly increased from 18% to 61.7% at follow-up in three weeks. Community WASH baseline scores improved from 11.1% (inadequate) to 69% with a basic level in two weeks. There was marked reduction in the incidence of new cases in the epicentre within the first 32 days. **Conclusion:** The results suggest that the IPC ring approach is an instrumental strategy health ministries can adopt to rapidly provide targeted comprehensive support at the source to interrupt transmission. A collaborative effort across pillars and partners in the implementation of the ring approach is key through concerted efforts and information sharing across response pillars.

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Clearing the Air, Breathe Easy: Intensive Care Unit Remodeling Unveils Insights into Aspergillosis Prevention
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Background: Invasive aspergillosis (IA) poses a substantial threat to morbidity and mortality, particularly among immunocompromised individuals. In 2023, a New York City Intensive Care Unit (ICU) experienced an aspergillus outbreak following a structural water leak, resulting in two patients diagnosed with Invasive Aspergillus niger in their bronchial cultures. Immediate interventions, including patient relocation and ICU reconstruction were implemented to mitigate further impacts. This study aims to assess the impact of timely relocation of patients and renovation of the ICU, on the incidence of invasive aspergillosis. **Method:** A quasi-experimental study design of ICU patients over a nine month period included surveillance by the Infection Prevention department from March 1 to December 1, 2023. Surveillance included review of microbiology reports, environmental cultures, and patient chart reviews. The Pre-intervention spanned March 1 to May 1, and the post-intervention from May 4 to December 1. Indoor mold assessments of pre- and post-intervention involved testing wall surfaces for moisture, air sample collection for fungal spores, and surface swabs for direct fungal analysis. The intervention included relocating all seventeen patients from the impacted ICU and comprehensive reconstruction. Reconstruction involved the removal and replacement of all sheetrock within the unit extending four feet from the floor with moisture-resistant sheetrock. Additionally, moisture resistant single sheet welded vinyl flooring and cove-bases were installed. All heating, ventilation, and air-conditioning (HVAC) systems were inspected and cleaned. Construction activities strictly adhered to Infection Control Risk Assessment (ICRA) guidelines, with emphasis on maintaining negative pressure, to ensure a safe environment. **Result:** Environmental swab samples from 50% of ICU rooms indicated growth of Aspergillus/Penicillium, Chaetomium, and Stachybotrys/Memnoniella type spores during the pre-intervention phase. Environmental microbiology results strongly suggest the indoor environment as the fungal spore source, with the presence of fruiting structures indicating surface mold growth. Indoor air samples, when compared to outdoor samples collected during pre-intervention, showed rare (2-6 raw count) growth of Aspergillus in 55% of the sampled rooms and subequently no growth post-intervention. Prospective surveillance revealed no further aspergillus growth in the ICU population and environment. **Conclusion:** Our findings highlight a potential correlation between environmental modifications and reduced IA incidence. Swift mitigation and structural interventions are crucial in averting potentially fatal outcomes, marking a significant advancement of prevention strategies for inner-city hospital settings. Although promising, study limitations include the inability to speciate environmental aspergillus for comparison to patient bronchial cultures and the absence of baseline bronchial cultures for affected patients on admission.

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Investigation of a Donor-derived Carbapenamase-producing Carbapenem-resistant Enterobacterales Hospital Outbreak
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