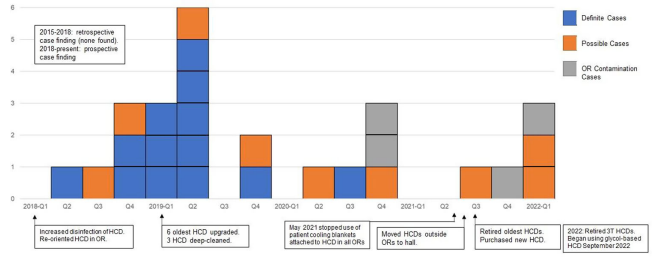

Figure: Timeline of HCD MAIC Infections and Implementation of Infection Control Measures
Abbreviations: HCD (Heater-Cooler Device); MAIC (*Mycobacterium avium-intracellulare* complex); OR (Operating Room)

undergone or are undergoing treatment for MAIC infection, and 4 (15%) have died due to NTM infection or complications. Compared to 47 controls, definite cases were associated with chronic kidney disease, implants, procedure type, use of cardiopulmonary bypass, and HCD age. Cases were not associated with time on bypass, time in the operating room, or other comorbid conditions (Table). All cases occurred despite enhanced disinfection and reorienting the HCD within the operating room, according to manufacturer recommendations. Moreover, 18 cases, including 7 definite cases, occurred after most HCDs were either deep cleaned or upgraded by the manufacturer. Also, 5 cases, including 3 possible cases and 2 contamination cases, occurred after physical separation of the HCD from the operating room. In August 2022, we purchased a fleet of glycol-cooled HCDs, and we have not identified additional MAIC cases since their deployment (Fig.). **Conclusions:** MAIC infections after cardiothoracic surgery were associated with procedure type, especially implants, use of cardiopulmonary bypass, and HCD age. Contrary to prior reports, neither operative nor CPB time was associated with MAIC infection after cardiothoracic surgery. The outbreak persisted despite disinfection and/or deep cleaning and reorienting HCDs within the operating room; some possible and contamination cases occurred even after moving HCDs outside the operating room. Thus, HCD water contamination events in the operating room (eg, spills from HCD tubing) may be a route of exposure, and different infection prevention measures are needed.

Disclosure: None

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Presentation Type:
Poster Presentation - Top Poster Award
Subject Category: Pediatrics

Epidemiology of carbapenem-resistant and extended-spectrum beta-lactamase-producing Enterobacterales in US children, 2016–2020

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Background: The Centers for Disease Control and Prevention's Emerging Infections Program conducts active laboratory- and population-based surveillance for carbapenem-resistant Enterobacterales (CRE) and extended spectrum beta-lactamase-producing Enterobacterales (ESBL-E). To better understand the U.S. epidemiology of these organisms among children, we determined the incidence of pediatric CRE and ESBL-E cases and described their clinical characteristics. **Methods:** Surveillance was conducted among children <18 years of age for CRE from 2016–2020 in 10 sites, and for ESBL-E from 2019–2020 in 6 sites. Among catchment-area residents, an incident CRE case was defined as the first isolation of *Escherichia coli*, *Enterobacter cloacae* complex, *Klebsiella aerogenes*, *K. oxytoca*, or *K. pneumoniae* in a 30-day period resistant to ≥1 carbapenem from a normally sterile site or urine. An incident ESBL-E case was defined as the first isolation of *E. coli, K. pneumoniae*, or *K. oxytoca* in a 30-day period resistant to any third-generation cephalosporin and non-resistant to all carbapenems from a normally sterile site or urine. Case records were reviewed. **Results:** Among 159 CRE cases, 131 (82.9%) were isolated from urine and 19 (12.0%) from blood; median age was 5 years (IQR 1–10) and 94 (59.1%) were female. Combined CRE incidence rate per 100,000 population by year ranged from 0.47 to 0.87. Among 207 ESBL-E cases, 160 (94.7%) were isolated from urine and 6 (3.6%) from blood; median age was 6 years (IQR 2–15) and 165 (79.7%) were female. Annual ESBL incidence rate per 100,000 population was 26.5 in 2019 and 19.63 in 2020. Incidence rates of CRE and ESBL-E were >2-fold higher in infants (children <1 year) than other age groups. Among those with data available, CRE cases were more likely than ESBL-E cases to have underlying conditions (99/158 [62.7%] versus 59/169 [34.9%], P<0.0001), prior healthcare exposures (74/158 [46.8%] versus 38/169 [22.5%], P<0.0001), and be hospitalized for any reason around time of their culture collection (75/158 [47.5%] versus 38/169 [22.5%], P<0.0001); median duration of admission was 18 days [IQR 3–103] for CRE versus 10 days [IQR 4–43] for ESBL-E. Urinary tract infection was the most frequent infection for CRE (89/158 [56.3%]) and ESBL-E (125/169 [74.0%]) cases. **Conclusion:** CRE infections occurred less frequently than ESBL-infections in U.S. children but were more often associated with healthcare risk factors and hospitalization. Infants had highest incidence of CRE and ESBL-E. Continued surveillance, infection prevention and control efforts, and antibiotic stewardship outside and within pediatric care are needed

Disclosure: None

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Presentation Type:
Poster Presentation - Top Poster Award
Subject Category: Product Evaluation

Evaluation of four environmental sampling methods for the recovery of multidrug-resistant organisms

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Background: Environmental contamination is a major risk factor for multidrug-resistant organism (MDRO) exposure and transmission in the healthcare setting. Sponge-stick sampling methods have been developed and validated for MDRO epidemiological investigations, leading to their recommendation by public health agencies. However, similar bacteriological yields with more readily available methods that require less processing time or specialized equipment have also been reported. We compared the ability of 4 sampling methods to recover a variety of MDRO taxa from a simulated contaminated surface. **Methods:** We assessed the ability of (1) cotton swabs moistened with phosphate buffer solution (PBS), (2) e-swabs moistened with e-swab solution, (3) cellulose-containing sponge sticks (CSS), and (4) non–cellulose-containing sponge sticks (NCS) to recover extended-spectrum β-lactamase (ESBL)–producing *Escherichia coli*, carbapenem-resistant *Pseudomonas aeruginosa* (CRPA), carbapenem-resistant *Acinetobacter baumannii* (CRAB), methicillin-resistant *Staphylococcus aureus* (MRSA), vancomycin-resistant *Enterococcus faecium* (VRE), and a mixture that contained VRE, MRSA, and ESBL organisms. A solution of known bacterial inoculum (~10^5 CFU/mL) was made for each MDRO. Then, 1 mL solution was pipetted on a stainless-steel surface (8 × 12 inch) in 5 µL dots and allowed to dry for 1 hour. All samples were collected by 1 individual to minimize variation in technique. Sponge sticks were expressed in PBS containing 0.02% Tween 80 using a stomacher, were centrifuged, and were then resuspended in PBS. Cotton and e-swabs were spun in a vortexer. Then, 1 mL of fluid from each method was plated to selective and nonselective media in duplicate and incubated at 35°C for 24 hours (MRSA plates, 48 hours) (Fig. 1). CFU per square inch and percentage recovery were calculated. **Results:** Table 1 shows the CFU per square inch and percentage recovery for each sampling method–MDRO taxa combination. The percentage recovery varied across MDRO taxa. Across all methods, the lowest rate of recovery was for CRPA and the highest was for VRE. Regardless of MDRO taxa, the percentage recovery was