

studies, which increased following the outbreak of Middle East respiratory syndrome in 2015, has declined over time but peaked in 2021 with the COVID-19 pandemic. The text network composed of the key words of the research abstracts was generated and visualized (Fig. 1). As a result of text network analysis, the 5 most common key words were ‘nurse,’ ‘infection control,’ ‘nursing care,’ ‘practice,’ and ‘perception’ in terms of degree and betweenness centrality. Other prominent main keywords were also identified: ‘knowledge,’ ‘compliance,’ ‘education,’ ‘intervention,’ ‘intention,’ and ‘safety.’ With the application of topic modeling to the research abstracts, 5 topics were derived and named as follows (Fig. 2): “infection control in nursing care for patient safety,” “infection control measures for healthcare personnel safety,” “burdens and obstacles for infection control among nurses,” “infection control for multidrug-resistant organisms,” and “knowledge, attitude, practice for infection control among nurses.”

Conclusions: By applying text-network analysis and topic modeling, we obtained insights into Korean ICN research trends. To explore global ICN research trends, further study is necessary to analyze internationally published studies reflecting each country’s nursing work conditions.

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Presentation Type:

Poster Presentation - Top Poster Award

Subject Category: Other

Screening infection prevention policies for equity impacts

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Background: Infection prevention teams utilize policies to guide practice; however, some policies may inadvertently uphold institutional racism and discrimination. Our institution utilizes an equity impact assessment tool during new policy creation or existing policy updates to identify, reduce, eliminate, and prevent inequities in care. **Methods:** We reviewed all 119 current institution-wide policy documents related to or managed by the infection prevention division at Seattle Children’s Hospital using an institutional equity impact assessment tool. The tool asks 6 open-ended questions to help policy owners identify potential inequities and to evaluate how marginalized groups may be affected. Each policy was assessed for its potential to create or sustain inequities for patients, families, or staff. Policies determined to have potential inequities were examined for any language to suggest that equity considerations had been incorporated into the existing policy. Initial policy review was performed by 2 infection prevention physicians, and disagreements were resolved by consensus. We defined the presence of equity considerations as any explicit mention of disparate impact of the policy on marginalized groups or mitigation of such effect. **Results:** Of the 119 policies reviewed, 43 (36%) were identified as having substantial potential to impact marginalized groups and create or sustain inequities. Among them, 42 (98%) of these policies lacked existing equity considerations. The policies with potential equity implications covered the following categories: COVID-19 (including masking, workforce restriction, testing), visitor restrictions, tuberculosis, central-line-associated bloodstream infections (CLABSIs), multidrug-resistant organisms (MDROs), public health reporting, medical behavioral unit policies, off-site affiliate housing policies, special pathogens program (including Ebola, MERS, SARS), surgical-site infections, home care including dialysis, and occupational health-related policies. Examples of policies that did not highlight inequities included those pertaining to construction, water intrusion, and transmission-based precautions. One example of change driven by use of the equity impact assessment tool concerned communication with patients and families about tuberculosis isolation and resulted in creation of a standardized multidisciplinary care conference to better communicate tuberculosis isolation processes (including testing required, visitor restrictions, and anticipated duration of isolation) to families in their language of care. **Conclusions:** Hospital-wide infection prevention policies have the potential to create or sustain existing

inequities. Systematic consideration of equity implications using an equity impact assessment framework could be the first step in mitigating these effects and can result in concrete actions to reduce systemic racism.

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Poster Presentation - Top Poster Award

Subject Category: Outbreaks

***Mycobacterium chimaera* infections in cardiothoracic surgery patients exposed to heating and cooling devices despite infection control measures**

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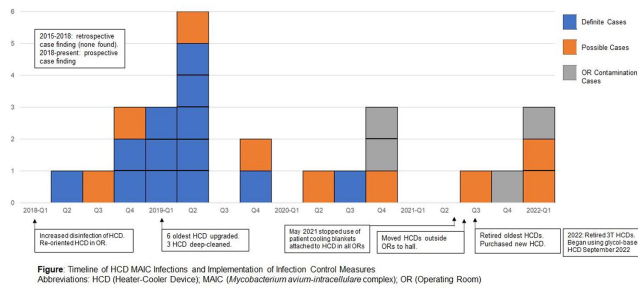
Background: LivaNova 3T heating and cooling devices (HCDs) have been associated with *Mycobacterium chimaera*, a *Mycobacterium avium*-intracellulare (MAIC) species, infections after cardiothoracic surgery. We describe our outbreak, which persisted despite escalating infection control measures. **Methods:** We identified patients with a positive MAIC culture following cardiothoracic surgery from January 2015 to the present at our institution. We classified these as “definite,” “possible,” or “operating room contamination” cases based on positive cultures from sterile sites, airway, or surgical specimens without evidence of infection. To identify patient or surgery characteristics associated with risk for MAIC infection, we conducted a case–control study comparing definite cases to randomly selected unmatched controls of patients over the same period without a positive MAIC culture after cardiothoracic surgery. **Results:** We identified 26 patients with a positive MAIC culture after cardiothoracic surgery: 13 definite, 9 possible, and 4 contamination cases. Among definite cases, the most common surgeries were valve replacements and left ventricular assist devices (5 cases each). The mean time from cardiothoracic surgery to diagnosis was 525 days. Overall, 10 (77%) cases occurred after exposure to our oldest HCDs (manufactured in 2013 or earlier). To date, 16 (62%) have

Table. Patients with Definite MAIC Compared to Those Without MAIC After CTS

	definite case (N=13)	control (N=47)	P-value
Mean age at surgery in years (SD)	55.0 (13.7)	73.0 (128)	NS
Race			
Caucasian	11 (84.6%)	35 (74.5%)	NS
African-American	2 (15.4%)	8 (17.0%)	NS
Asian	0 (0%)	1 (2.1%)	NS
Unknown	0 (0%)	3 (6.4%)	NS
Male gender	13 (100%)	38 (80.9%)	NS
Mean body mass index (SD)	27.4 (5.51)	27.1 (4.87)	NS
Diabetes mellitus	2 (15.4%)	9 (19.1%)	NS
Chronic kidney disease	4 (30.8%)	2 (4.3%)	0.017
Immunocompromised	1 (7.7%)	3 (6.4%)	NS
Implants placed during surgery	12 (92.3%)	13 (27.7%)	<0.001
Procedure type			
CABG	1 (7.7%)	15 (31.9%)	NS
Bioprosthetic valve	2 (15.4%)	9 (19.1%)*	NS
Mechanical valve	3 (23.1%)	3 (6.4%)	NS
CHD repair/palliation	1 (7.7%)	4 (8.5%)	NS
Heart transplant	1 (7.7%)	1 (2.1%)	NS
Lung transplant	0 (0%)	1 (2.1%)	NS
LVAD	5 (38.5%)	1 (2.1%)	<0.001
Other	0 (0%)	13 (27.7%)	NS
Cardiopulmonary bypass (CBP) used	12 (92.3%)	28 (59.6%)	0.043
Mean CBP time in minutes (SD)	129 (49.4)	125 (62.6)	NS
Mean time in OR in minutes (SD)	429 (137)	416 (449)	NS
Mean HCD age in year at time of index surgery (SD)	10.9 (2.08)	7.39 (3.42)	0.0041

Abbreviations: SD (standard deviation); MAIC (*Mycobacterium avium*-intracellulare complex); CTS (cardio-thoracic surgery); CABG (coronary artery bypass graft); CHD (congenital heart defect); LVAD (left ventricular assist devices); CBP (cardiopulmonary bypass)

*One bioprosthetic valve case also included a CABG, and one bioprosthetic valve case also included a CHD repair.



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.

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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

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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 (~10⁵ 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