shifts at additional quantiles, which would provide additional evidence that TBE is a metric that can be used for setting benchmarks and can serve as a signal of CLABSI prevention progress.
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Presentation Type:
Poster Presentation
The Burden of Gastroenteritis Outbreaks in Long-Term Care Settings in Philadelphia, 2009–2018
Hansol Kang, University of Florida College of Medicine; Susan Coffin, Childrens Hospital of Philadelphia; Tiina Peritz, Philadelphia Department of Public Health

Background: Gastroenteritis causes significant morbidity and mortality in long-term care facility (LTCF) residents, a growing population within the United States. **Methods:** We conducted a retrospective cross-sectional study in LTCFs in Philadelphia County from 2009 to 2018. Outbreak characteristics and interventions were extracted from Philadelphia Department of Public Health's (PDPH) database, and quality data on all LTCFs was extracted from the CMS Nursing Home Compare database. **Results:** We identified 121 gastroenteritis outbreaks in 49 facilities. Numbers of affected patients ranged from 2 to 211 patients (median patient attack rate, 17%). Staff were reported ill in 94 outbreaks (median staff attack rate, 5%). Outbreak facilities were associated with higher occupancy rates (91% vs 88%; $P = .033$) and total bed numbers (176 vs 122; $P = .071$) when compared to nonoutbreak facilities. Higher rates of staff illness were associated with prolonged outbreaks (13% vs 4%; $P < .001$) and higher patient illness rates (9% vs 4%; $P = .012$). Prolonged outbreaks were associated with lower frequency of cohorting for outbreak management (13% vs 41%; $P = .046$). **Conclusions:** This study is the largest published analysis of gastroenteritis outbreaks in LTCFs. Facility characteristics and staff disease 20 activity were associated with more severe outbreaks. Heightened surveillance for gastrointestinal symptoms among staff and increased 21 use of cohorting might reduce the risk of prolonged gastroenteritis outbreaks in LTCF.
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Presentation Type:
Poster Presentation
The Daily Direct Costs of Isolating Patients Identified With Highly Resistant Microorganisms
Manon van Dijk, Department of Medical Microbiology and Infectious Diseases, Erasmus MC, University Medical Center, Rotterdam, The Netherlands; Anne F. Voor in 't holt, Medical Microbiology and Infectious Diseases, Erasmus University Medical Centre; Juliëtte Severin, Erasmus MC University Medical Center Rotterdam; Suzanne Polinder, Department of Public Health, Erasmus University Medical Center Rotterdam, The Netherlands; M. Vos, ErasmusMC

Background: Isolation precautions are recommended when caring for patients identified with highly resistant microorganisms (HRMOs). However, the direct costs of isolating patients are largely unknown. Therefore, we aimed to obtain detailed information on the daily direct costs associated with isolating patients identified with HRMO. **Methods:** This study was performed from November until December 2017 on a 12-bed surgical ward. This ward contained solely isolation rooms with an anteroom. The daily direct costs of isolation were based on three cost items: (1) additional personal protective equipment (PPE); measured by counting the consumption of empty packaging materials, (2) cleaning and disinfection of the isolation room; based on the costs of an outsourced cleaning company, and (3) additional workload for healthcare workers; based on literature and multiplied by the average gross hourly salary of nurses. A distinction was made between the costs for strict isolation, contact-plus isolation, and contact isolation. **Results:** During the study period, 26 patients were nursed in isolation because of HRMO carriage, resulting in a total of 304 isolation days (median 7 isolation days; range 1-44). Gloves were consumed the most and hair caps the least. The average daily direct costs of isolation were the least expensive for contact isolation, €28/$31, and the most expensive for strict isolation, €41/$47. **Conclusions:** By using a novel, easy method to estimate consumption of PPE, we conclude that the daily direct costs of isolating a patient, differs per type of isolation. Insight into the direct costs of isolation is of utmost importance when developing or revising policies.
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Poster Presentation
The Development of an Environmental Surveillance Protocol to Detect *Candida auris* and Measure the Adequacy of Discharge Room Cleaning Performed by Different Methods
Sadie Solomon, NYU Langone Health System; Michael Phillips, NYU Langone Medical Center; Anne Kelly, NYU Langone Health System; Akwasi Darko, NYU Langone Health System; Frank Palmeri, NYU Langone Health System; Peter Aguilar, NYU Langone Health System; Julia Gardner, NYU Langone Health System; Judith Medefindt, NYU Langone Health System; Stephanie Sterling, NYU Langone Health System; Maria Aguero-Rosenfeld, NYU Langone Health System; Anna Stachel, NYU Langone Health

Background: Contaminated surfaces within patient rooms and on shared equipment is a major driver of healthcare-acquired infections (HAIs). The emergence of *Candida auris* in the New York City metropolitan area, a multidrug-resistant fungus with extended environmental viability, has made a standardized assessment of cleaning protocols even more urgent for our multihospital academic health system. We therefore sought to create an environmental surveillance protocol to detect *C. auris* and to assess patient room contamination after discharge cleaning by different chemicals and methods, including touch-free application using an electrostatic sprayer. Surfaces disinfected using touch-free methods may not appear disinfected when assessed by fluorescent tracer dye or ATP bioluminescent assay. **Methods:** We focused on surfaces within the patient zone which are touched by the patient or healthcare personnel prior to contact with the patient. Our protocol sampled the over-bed table, call button, oxygen meter, privacy curtain, and bed frame using nylon-flocked swabs dipped in nonbacteriostatic sterile saline. We swabbed a 36-cm^2 surface area on each sample location shortly after the room was disinfected, immediately inoculated the swab on a blood agar 5% TSA plate, and then incubated the plate for 24 hours at 36°C. The contamination with common environmental bacteria

was calculated as CFU per plate over swabbed surface area and a cutoff of 2.5 CFU/cm^2 was used to determine whether a surface passed inspection. Limited data exist on acceptable microbial limits for healthcare settings, but the aforementioned cutoff has been used in food preparation. **Results:** Over a year-long period, terminal cleaning had an overall fail rate of 6.5% for 413 surfaces swabbed. We used the protocol to compare the normal application of either peracetic acid/hydrogen peroxide or bleach using microfiber cloths to a new method using sodium dichloroisocyanurate (NaDCC) applied with microfiber cloths and electrostatic sprayers. The normal protocol had a fail rate of 9%, and NaDCC had a failure rate of 2.5%. The oxygen meter had the highest normal method failure rate (18.2%), whereas the curtain had the highest NaDCC method failure rate (11%). In addition, we swabbed 7 rooms previously occupied by *C. auris*–colonized patients for *C. auris* contamination of environmental surfaces, including the mobile medical equipment of the 4 patient care units that contained these rooms. We did not find any *C. auris*, and we continue data collection. **Conclusions:** A systematic environmental surveillance system is critical for healthcare systems to assess touch-free disinfection and identify MDRO contamination of surfaces.

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The Great Masquerade: Identification of Clinically Relevant *Clostridioides difficile* Infections

Emily Sickbert-Bennett, UNC Health Care; Lisa Stancill, UNC Health Care; Lauren DiBiase, UNC Health Care; Kevin Alby, UNC Health Care; David Jay Weber, University of North Carolina at Chapel Hill

Background: Despite clear guidance for appropriate testing of symptomatic patients for *Clostridioides difficile* testing (McDonald et al), the ideal testing methodology remains unresolved. Laboratories currently use different algorithms that incorporate enzyme immunoassay (EIA) testing for toxin, glutamate dehydrogenase (GDH) antigen, and polymerase chain reaction (PCR) testing in combination or as a single test. At UNC Hospitals, a large academic hospital with nearly 1,000 beds in the ninth most populous state in the United States, patients are currently tested by an EIA test for toxin and GDH antigen first, and discordant toxin/GDH results are referred for PCR testing. Previous studies have demonstrated that detection of toxin by EIA is a better predictor of *C. difficile* infection (CDI) complications (Polage et al). **Methods:** We investigated all patients who were tested for *C. difficile* from July 2018 to June 2019. Within each testing methodology and result, we assessed the percentage of patients with at least 3 loose stools documented within a 24-hour period, percentage with a severe episode based on white blood cell (WBC) counts >15,000 cells/mL, or percentage with a serum creatinine level >1.5 mg/dL. Fisher-type confidence intervals were calculated for each proportion. **Results:** Patients positive for *C. difficile* by the EIA method had 66.9% appropriate loose stool documentation (95% CI, 57.4%–75.5%), whereas patients with EIA-indeterminate (toxin negative, GDH positive) and positive by only PCR had 49.7% appropriate loose stool documentation (95% CI, 42.7%–56.8%). *C. difficile* patients that tested negative had 48.1% appropriate loose stool documentation (95% CI, 46.0–50.2%). In addition, patients positive by the EIA method had nearly double the proportion of severe disease by WBC or creatinine criteria compared to patients who were either positive by PCR or who tested negative (Table 1). **Conclusions:** Patients positive for *C. difficile* by the EIA method were statistically more likely to meet criteria for loose stool documentation. There was no statistically significant difference between patients that tested positive only by PCR or who tested negative. The percentage of patients with severe episode criteria based on WBC or creatinine was nearly doubled between those who tested positive by EIA and PCR (20% vs 10%), although this finding was not statistically significant. The percentage with severe disease (WBC or creatinine) was nearly identical among patients who were positive by PCR and who tested negative. These findings demonstrate that documentation of loose stool is a more sensitive indicator of toxin detection than either clinical parameter, reinforcing the importance of stool documentation in evaluating patients for *C. difficile* testing.

Table 1.

Table: Markers of CDI severity by test type

	% with appropriate loose stools (95% CI)	% severe WBC (95% CI)	% severe creatinine (95% CI)
EIA Positive	66.9% (57.4, 75.5%)	21.4% (14.2, 30.2%)	20.5% (13.5, 29.2%)
PCR Positive	49.7% (42.7, 56.8%)	10.7% (6.8. 15.8%)	13.7% (9.3, 19.1%)
Negative	48.1% (46.0, 50.2%)	10.8% (9.6, 12.2%)	11.7% (10.3, 13.1%)

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The ICEL Healthcare-Associated Infection Probability Equation

Mark Moore, John's Hopkins Bayview Medical Center

Backround: In American hospitals alone, the CDC estimates that hospital acquired infections (HAIs) account for an estimated 1.7 million infections and 99,000 associated deaths each year.[1] Although the United states and most industrialized nations have made strides in lowering the overall HAI rate by taking critical steps to reduce HAIs, an overall formula that combines a global risk assessment per patient for HAI acquisition has yet to be established. To address this issue, we developed the ICEL equation. This equation uses a probabilistic argument to estimate the likelihood of HAI acquisition and to promote infection control dialogue among healthcare practitioners from diverse healthcare disciplines. **Methods:** We defined HAI risk using the ICEL acronym as follows: HAI risk = (I + C + E + L), where I is invasive devices present; C is patient-specific characteristics; E is the average number of pathogenic organisms in the patient environment; and L is the length of stay. A simple scale of 1–10 points is subjectively assigned for each of the following categories:

I = (number of invasive devices / surgeries / % body surface areas open)

C = Patient specific characteristics (immune system integrity / immunomodulators / radiation exposure / chemotherapy, etc)

E = Environmental conditions / cleaning (average number of pathogenic bacteria in room, 100% hand hygiene compliance, patient / staff colonization, etc)

L = Length of stay days risk, where 0–3 days is low risk, 4–7 is moderate risk, and 8–10+ is high risk