Holroyd-Leduc, Alberta Health Services; Thomas Louie , Alberta Health Services; John Conly, Foothills Medical Centre

Background: Hospital-acquired *Clostridioides difficile* infection (HA-CDI) rates are highly variable over time, posing problems for research assessing interventions that might improve rates. By understanding seasonality in HA-CDI rates and the impacts that other factors such as influenza admissions might have on these rates, we can account for them when establishing the relationship between interventions and infection rates. We assessed whether there were seasonal trends in HA-CDI and whether they could be accounted for by influenza rates. **Methods:** We assessed HA-CDI rates per 10,000 patient days, and the rate of hospitalized patients with influenza per 1,000 admissions in 4 acute-care facilities (n = 2,490 beds) in Calgary, Alberta, from January 2016 to December 2018. We used 4 statistical approaches in R (version 3.5.1 software): (1) autoregressive integrated moving average (ARIMA) to assess dependencies and trends in each of the monthly HA-CDI and influenza series; (2) cross correlation to assess dependencies between the HA-CDI and influenza series lagged over time; (3) Poisson harmonic regression models (with sine and cosine components) to assess the seasonality of the rates; and (4) Poisson regression to determine whether influenza rates accounted for seasonality in the HA-CDI rates. **Results:** Conventional ARIMA approaches did not detect seasonality in the HA-CDI rates, but we found strong seasonality in the influenza rates. A cross-correlation analysis revealed evidence of correlation between the series at a lag of zero (R = 0.41; 95% CI, 0.10–0.65) and provided an indication of a seasonal relationship between the series (Fig. 1). Poisson regression suggested that influenza rates predicted CDI rates ($P < .01$). Using harmonic regression, there was evidence of seasonality in HA-CDI rates (χ^2 [2 df] = 6.62; $P < .05$) and influenza rates (χ^2 [2 df] = 1,796.6; $P < .001$). In a Poisson model of HA-CDI rates with both the harmonic components and influenza admission rates, the harmonic components were no longer predictive of HA-CDI rates. **Conclusions:** Harmonic regression provided a sensitive means of identifying seasonality in HA-CDI rates, but the seasonality effect was accounted for by influenza admission rates. The relationship between HA-CDI and influenza rates is likely mediated by antibiotic prescriptions, which needs to be assessed. To improve precision and reduce bias, research on interventions to reduce HA-CDI rates should assess historic seasonality in HA-CDI rates and should account for influenza admissions.

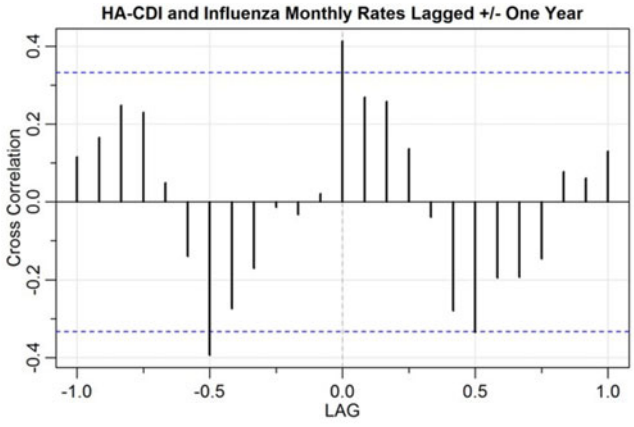

Figure 1 Plot of correlations between monthly series of HA-CDI and Influenza rates. Vertical lines represent Pearson correlation of the series with the influenza series shifted (lagged) in time relative to the HA-CDI series. The dashed blue line corresponds to a two-tailed P<0.05.

Fig. 1.

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Presentation Type:
Poster Presentation

Impact of the Revised Non–Culture-Based Methodology Criteria on Central-Line–Associated Bloodstream Infections

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Background: The current NHSN guideline states that positive results from both blood cultures and non–culture-based testing (NCT) methodologies are to be used for central-line–associated bloodstream infection (CLABSI) surveillance determination. A positive NCT result in the absence of blood cultures or negative blood cultures in patients who meet CLABSI criteria is to be reported to NHSN. However, the reporting criteria for NCT changed starting January 1, 2020: If NCT is positive and the blood culture is negative 2 days before or 1 day after, the NCT result is not reported. If the NCT is positive with no blood culture within the 3-day window period, the NCT result is reported in patients who meet CLABSI criteria. We estimated the impact of the new NCT criteria on CLABSI numbers and rates compared to the previous definition. **Methods:** At our facility, the T2Candida Panel (T2), an NCT, was implemented for clinical use for the detection of early candidemia and invasive candidiasis. The T2 is a rapid molecular test performed directly on blood samples to detect DNA of 5 *Candida* spp: *C. albicans/C. tropicalis*, *C. glabrata/C. krusei*, and *C. parapsilosis*. In this retrospective study performed at an 877-bed teaching hospital in Detroit, we reviewed the impact of discordant T2 results (positive T2 with negative blood cultures) on CLABSI rates from January 1, 2017, to September 30, 2019, based on the current definition, and we applied the revised criteria to estimate the new CLABSI numbers and rates for the same period. **Results:** Of 343 positive T2 results, 202 (58.9%) were discordant and qualified for CLABSI determination during the study period. Of these, 109 (54%) met CLABSI criteria based on the current definition and 11 (5%) met CLABSI criteria using the new definition (proportional $P < .001$), resulting in an 89.9% reduction. The CLABSI rate per 1,000 central-line days, which includes discordant T2 results, based on the current and new NCT criteria, are listed in Table 1. **Conclusions:** In institutions that utilize NCT such as T2, application of the new 2020 NCT NHSN definition would significantly reduce the CLABSI number and have a significant impact on the CLABSI rates and standardized infection ratios (SIRs).

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Impact of UV-Light Use on the Quality of Manual Cleaning and Room Turnover Times at a Large Tertiary-Care Hospital, 2019

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University of Iowa Healthcare; Angie Dains, University of Iowa Hospital and Clinics; Tatiana Izakovic; Kyle Jenn, University of Iowa Hospitals & Clinics; Holly Meacham, University of Iowa Hospital and Clinics; Glen Rogers, University of Iowa Hospitals & Clinics; Bill Millard, University of Iowa Hospitals & Clinics; Daniel Diekema, University of Iowa Carver College of Medicine; Michael Edmond, University of Iowa Hospitals and Clinics; Jorge Salinas, University of Iowa

Background: Manual cleaning is the recommended method of environmental disinfection; it plays a key role in the prevention of healthcare-associated infections. Recently, automated "no-touch" disinfection technologies, such as ultraviolet (UV) light, have been proposed as a supplement to manual cleaning. However, UV light adds time to the cleaning process and may decrease the quality of manual cleaning. We evaluated the impact of adding UV light on the quality of manual cleaning and on room turnover times. **Methods:** During January–September 2019, we assessed the thoroughness of disinfection cleaning (TDC) of environmental surfaces in rooms identified for discharge. According to hospital policy, contact precautions rooms use UV light after manual cleaning with an EPA-approved sporicidal agent (bleach). Non–contact precautions rooms are disinfected using quaternary ammonium only. Rooms were identified after patient admission, selected randomly, and marked once discharge orders were placed. Fluorescent markers were applied on high-touch surfaces before discharge and were assessed after the cleaning process was completed. TDC scores were defined as the percentage of cleaned surfaces of the total of examined surfaces. UV-light disinfection time is determined automatically based on room size. We compared TDC scores and manual cleaning times between contact precautions rooms and noncontact precautions rooms. We also calculated UV-light cycle durations. **Results:** We assessed 2,383 surfaces in 24 contact precautions rooms with UV-light disinfection and 201 noncontact precautions rooms without UV-light disinfection. The TDC score was similar in contact precautions rooms (243 of 273 surfaces) and noncontact precautions rooms (1,835 of 2,110 surfaces; 89% vs 87%). The median manual cleaning time for contact precautions rooms was 56 minutes (IQR, 37–79), and for noncontact precautions rooms the median manual cleaning time was 33 minutes (IQR, 22–43). UV-light use added a median of 49 minutes (IQR, 35–67) to the overall cleaning process. The median turnover time for contact precautions rooms was 156 minutes (IQR, 87–216) versus 58 minutes (IQR, 40–86) in noncontact precautions room. **Conclusions:** In a setting with an objective assessment of environmental cleaning, there was no difference in quality of manual cleaning between contact precautions rooms (UV light) and noncontact precautions rooms (UV light). Adding UV light following manual disinfection increased the overall cleaning time and delayed room availability.

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Impact on National Policy on the Hand Hygiene Promotion Activities in Hospitals in Korea

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Background: After the Middle East respiratory syndrome coronavirus outbreak in Korea in 2015, the government newly established the additional reimbursement for infection prevention to encourage infection control activities in the hospitals. The new policy was announced in December 2015 and was implemented in September 2016. We evaluated how infection control activities improved in hospitals after the change of government policy in Korea. **Methods:** Three cross-sectional surveys using the WHO Hand Hygiene Self-Assessment Framework (HHSAF) were conducted in 2013, 2015, and 2017. Using multivariable linear regression model including hospital characteristics, we analyzed the changes in total HHSAF scores according to the survey time. **Results:** In total, 32 hospitals participated in the survey in 2013, 52 in 2015, and 101 in 2017. The number of inpatient beds per infection control professionals decreased from 324 in 2013 to 303 in 2015 and 179 in 2017. Most hospitals were at intermediate or advanced levels of progress (90.6% in 2013, 86.6% in 2015, and 94.1% in 2017). In a multivariable linear regression model, the total HHSAF scores were significantly associated with hospital teaching status (β coefficient of major teaching hospital, 52.6; 95% CI, 8.9–96.4; $P = .018$), bed size (β coefficient of 100-bed increase, 5.1; 95% CI, 0.3–9.8; $P = .038$), and survey time (β coefficient of 2017 survey, 45.1; 95% CI, 19.3–70.9; $P = .001$). **Conclusions:** After the national policy implementation, the number of infection control professionals increased, and the promotion of hand hygiene activities was strengthened in Korean hospitals.

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Implement Electronic Decision Support to Decrease Hospital-Onset *Clostridium difficile* Infections at Two Community Hospitals

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Background: Literature supports appropriate testing as a key factor affecting the hospital-onset (HO) *Clostridium difficile* infections (CDI) standardized infection ratio (SIR). In 2016, facility A was a significant outlier in HO CDI with an SIR of 2.57. In 2017, facility B had a peak SIR of 1.9. Both SIRs were considerably