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2177. Use of an Analytic Application for Management of Infection Prevention Data
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Background. Healthcare-associated infections (HAI) are a significant cause of morbidity and mortality for patients and continue to be an area of focus for public health programs. In the era of mandatory reporting, hospital infection prevention and control (IPC) departments are responsible for HAI data collection and management. Enumeration of infection and denominator data is often a manual and time-intensive process, which increases the potential for errors. In 2014, IPC and data analytics departments partnered to optimize data collection/reporting through the creation of a QbikView® application, the Infection Control Dashboard (ICD).

Methods. ICD was developed through an iterative process from 2014 to 2015 at a quaternary care children’s hospital and is comprised of infection data from the hospital, electronic surveillance system and electronic medical record software. The first release was May 2014. Iterations included development of statistical process control charts and filters to view data by hospital, pathway, infection, HAI type, and patient details. ICD is standard data displays for internal sharing and tracking infection rates by type, location, or department. ICD also allowed for internal review of detailed denominator data, facilitating validation between internally and externally reported data.

Conclusion. Development of an automated data visualization tool improved HAI data management and reporting, streamlined workflow, and increased employee productivity. Use of this type of tool in IPC programs can improve data quality and enable departments to focus on targeted interventions in near-real time based on data trends.

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2178. Detection of Key Potential Healthcare Pathogens Using Periodic Point Prevalence Surveillance
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Background. Surveillance for asymptomatic carriage of multidrug-resistant (MDR) organisms in healthcare settings can help guide infection prevention strategy. We currently perform surveillance cultures for Gram-negative multidrug-resistant pathogens (GNMDR) in the ICUs on a monthly basis. We added a quarterly point prevalence survey to all hospital units for these and other key pathogens over one year to determine whether our program should expand beyond the ICU and include other organisms.

Methods. Rectal samples were collected quarterly for 1 year starting June 2016 at NorthShore University HealthSystem, a four-hospital, 789 bed system. All hospitalized patients present on the day of the point prevalence testing had a double-headed rectal swab collected. One swab was plated to VACC agar (Remel) for culture of GNMDR and VRE, and the second was plated to CCEFAH (Anaerobe systems) for C. difficile (Cdiff) culture. All samples were collected on a specified day at each of our 4 hospitals, one hospital per week, and sent to the central microbiology lab for processing. Testing for GNMDR included the following pathogens: Carbapenem-resistant Enterobacteriaceae (CRE), ESBLs, and Gram negative organisms susceptible to ≤2 drug classes.

Results. A total of 987 surveillance samples were collected. The number of patients with MDR in the ICU vs. non-ICU units is described in Table 1. There was an 11% greater difference in the percentage of patients colonized with GNMDR and Cdiff in non-ICU patients compared with ICU patients (P = 0.006). An important discovery was three patients colonized with CRE outside the ICU that were previously unknown. The burden of ESBL, VRE and Cdiff carriage was also greater outside the ICU.

Table 1. Comparison of Patients in ICU vs. Non-ICU with Important Hospital Pathogens
| Pathogens | No. Tests | Important Pathogens (%) | ESBL | CRE | MDR | VRE | Toxigenic Cdiff |
|------------|-----------|-------------------------|------|-----|-----|-----|----------------|
| Non-ICU    | 823       | 175 (21%)               | 79   | 3   | 5   | 64  | 47             |
| ICU        | 154       | 17 (11%)                | 5    | 2   | 1   | 7   |

Conclusion. The point prevalence surveillance uncovered a significant amount of MDRs in our non-ICU units, particularly three CREs that were previously unknown. These results suggest there is a large burden of MDR organisms outside the ICU.

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2179. Variability in the Application of Surveillance Definitions for Central Line-Associated Bloodstream Infection Across U.S. Hospitals
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Background. In 2015, the Centers for Disease Control and Prevention (CDC) and the Centers for Medicare and Medicaid Services (CMS) reminded hospitals of the importance of using standardized surveillance definitions to report healthcare-associated infections (HAIs). Concerns remain, however, about how hospitals apply these definitions.

Methods. We performed a survey via the Society for Healthcare Epidemiology of America’s Research Network exploring reporting differences for central line-associated bloodstream infection (CLABSI) in U.S. hospitals. Three patient scenarios were presented, and respondents were asked to determine whether the infection was a CLABSI reportable to the CDC’s National Healthcare Safety Network (NHSN), a secondary bloodstream infection, or an infection present on admission. Hospitals were also asked how they adjudicate cases when having a difficult time determining the type of infection, including whether hospitals contact NHSN, ask for physician or committee guidance on HAI determination, or rely solely upon NHSN definitions.

Results. We sent the survey to 88 U.S. hospitals and received a response from 42 (48%). The respondents included 32 infection preventionists (IPs) and 10 non-IPs involved in infection prevention. Respondents correctly classified the case 79.4% of the time (95% CI: 71.7-86.1%). The additional real-time feedback option included standard data displays for internal sharing and tracking infection rates by type, location, or department. ICD also allowed for internal review of detailed denominator data, facilitating validation between internally and externally reported data.

Conclusion. Our findings suggest variability in the application of NHSN surveillance criteria for CLABSI, with a high reliance on physician or committee review. This appears to result in higher-under-reporting by non-AMCs.

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2180. Incidence and Outcomes of Ventilator-Associated Events, Utilising Centre for Disease Control Criteria in a Tertiary Intensive Care Unit, Victoria, Australia
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Background. Ventilator-associated pneumonia (VAP) is a common complication of admission to intensive care units (ICU), and may be associated with significant morbidity, mortality and healthcare cost. While VAP surveillance is a desirable element
of ICU infection prevention programmes, the lack of an easily applicable definition, providing accurate and clinically meaningful data limits implementation. We aimed to conduct a pilot study of ventilator associate event (VAE) surveillance, per Centre for Disease Control National Healthcare Safety Network (CDC NHSN) criteria, to describe the incidence, and outcomes for patients with VAE in our setting.

Methods. We conducted a prospective cohort study in our 24-bed mixed tertiary ICU in Melbourne, Australia. Adult patients requiring mechanical ventilation for 22 days between March and October, 2015, were included. We collected detailed clinical and laboratory data, including antibiotic duration and indication, and ICU and hospital length of stay. We applied the CDC NHSN criteria.

Results. We included 202 patients (median age 58.1 ± 17.8 years, 32.7% female, 73% medical), over 1,390 ventilator days. Ventilator associated condition (VAC) occurred in 33 (16.3%) patients (23.7 per 1,000 ventilator days), Infection-related VAC (IVAC) in 15 (7.4%) patients (10.7 per 1,000 ventilator days), and possible VAP (PVAP) in 8 (3.9%) patients (5.75 per 1,000 ventilator days). In contrast, clinician-diagnosed VAP (CD-VAP) occurred in 37 (18.3%) patients (26.6 per 1,000 ventilator days). Patients with VAC had a greater median number of ventilator days (12 vs. 4, P < 0.001), ICU length of stay (LOS) (17 vs 6 days, P < 0.005), hospital LOS (30 vs 19 days, P = 0.005), and antibiotic days (12 vs. 5, P < 0.001), than those without VAC. CD-VAP was associated with VOR (OR 4.7, 95% CI 2.1–10.6, P < 0.001), but agreement was poor (kappa 0.29). The overall sensitivity of VAC for CD-VAP was 36%, specificity was 89%, PPV 48%, NPV 85%, while for PVAP these were 17, 99, and 82%, respectively.

Conclusion. VAC is associated with important, measurable surveillance outcomes, but the agreement, sensitivity and predictive value of these criteria for CD-VAP are poor. Hence the CDC criteria may miss clinically important healthcare-associated infections and may not capture the most appropriate target group for VAP prevention.

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2181. Efficacy of UV-C Disinfection with or Without Sodium Hypochlorite Compared with Usual Disinfection of Hospital Environmental Surfaces: Pilot Study

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Background. The Centers for Medicare and Medicaid Services (CMS) requires hospitals to report healthcare-associated infections (HAIs) through the Hospital Inpatient Quality Reporting Program. Facilitated by the Centers for Disease Control and Prevention’s National Healthcare Safety Network (NHSN), mandatory reporting aims to improve quality by benchmarking and improving transparency. In addition, the majority of U.S. states have policies in place for mandatory reporting of HAIs in acute care hospitals. The aim of this study was to examine Infection Preventionists’ perceptions of the impact of mandatory reporting on infection prevention and control (IPC) departments.

Methods. In winter of 2018, we electronically surveyed IPs working in acute care hospitals. The survey was distributed by the Association of Professionals in Infection Prevention and Epidemiology (APIC) to its members via an initial email and weekly e-blasts over a 6-week period. Descriptive statistics were conducted and themes from open-ended questions were analyzed to describe IP perceptions of mandatory reporting.

Results. There were 255 IPs who completed the survey; 187 IPs provided responses in the mandatory reporting section. Half (53%) reported that mandatory reporting resulted in more influence of the IPC department on hospital decision making and 38% reported increased visibility. The most important benefit of mandatory reporting was increased awareness of IPC for hospital administrators (42%), followed by transparency of outcomes for patients and providers (28%). However, a third of IPs reported an increase in staff education and routine IPC activities. IPs also reported an increased workload and lack of action based on the results of the reports as drawbacks of reporting mandates.

Conclusion. According to IPs, mandatory reporting has resulted in increased visibility and awareness of IPC in their hospitals, however, some drawbacks were also identified. Given CMS and state mandates for HAI reporting, policy makers need to be attuned to additional demands placed on hospitals to comply with mandatory reporting processes. Future research should aim to examine whether IPC departments have sufficient resources to comply with these regulatory policies and ways in which to improve the reporting process.

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2183. Financial Cost, Length of Stay, and Patient Experience Associated with Healthcare-Associated Infections Across a 43 Hospital Network

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Background. Hospital-acquired infections (HAIs) are critical to improve patient safety and hospital quality. However, not all HAI-associated outcomes are well studied. We examined several of these—the financial and length of stay (LOS) burden of HAIs and patient experience—across all HAI groups.

Methods. National Healthcare Safety Network-reported catheter-associated urinary tract infections (CAUTI), C. difficile infections (CDI), central line-associated bloodstream infections (CLABSI), MRSA bacteremia, and colon surgery site infections (SSI-COLO) were queried for the first 9 months of 2016 from 43 hospitals. Patients with an HAI were matched to controls on hospital and primary diagnosis to create a retrospective case–control study. CAUTI and CLABSI patients were matched to controls with associated device codes. LOS and total attributable cost (ATC) were calculated for all HAI and control patients. If patients returned a Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey, their likelihood to recommend (LTR) response was additionally analyzed.

Results. Data were analyzed for 123 CAUTI, 1,116 CDI, 166 CLABSI, 58 MRSA, and 127 SSI-COLO case–control pairs across 43 hospitals. TDVC per case was significantly higher among HAI cases than controls for CDI ($6,484), CLABSI ($14,646), and SSI-COLO ($9770; figure 1). LOS was significantly higher for cases across all HAI groups, with attributable differences of 7.6 days for CAUTI, 6.4 for CDI, 9.7 for CLABSI, 7.4 for MRSA, and 4.5 for SSI-COLO (Figure 2). Of 3,180 subjects, 98 returned HCAHPS surveys. Response rate of “Yes, definitely” to LTR for 85 HAI patients was 63.5% compared with 72.6% for 113 control patients (Figure 3).

Figure 1: Mean hospital cost attributable to cases of HAI and control.