EDs (89 vs 52, respectively). The most frequently touched surfaces in EDs included stretcher rails, privacy curtains, visitor chair arm rests and seats, and patient bedside tables, which together accounted for 68.8% of all touch episodes in EDs (Fig. 1). Frequently touched surfaces in HDFs included both shared and single-patient surfaces: 27.8% and 72.2% of HDF touch episodes, respectively. The most frequently touched surfaces in HDFs were supply cart drawers, dialysis machine control panels and keyboards, handwashing faucet handles, bedside work tables, and bed rail or dialysis chair armrests, which accounted for 68.4% of all touch-episodes recorded. **Conclusions:** To our knowledge, this is the first quantitative study to identify HTSs in EDs and HDFs. Our observations reveal that certain surfaces within these environments are subject to a substantially greater frequency of hand contact than others and that a relatively small number of surfaces account for most touch episodes. Notably, whereas HTSs in EDs were primarily single-patient surfaces, HTSs in HDFs included surfaces shared in the care of multiple patients, which may represent an even greater risk of patient-to-patient pathogen transmission than single-patient surfaces. The identification of HTSs in EDs and HDFs contributes to a better understanding of the risk of environment-related pathogen transmission in these settings and may allow prioritization and optimization of cleaning and disinfection resources within facilities.

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Rapid PCR Influenza Testing Decreases Inappropriate Empiric Antibiotic Use

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Background: The clinical picture of influenza-like illness can mimic bacterial pneumonia, and empiric treatment is often initiated with antibacterial agents. Molecular testing such as polymerase chain reaction (PCR) is often used to diagnose influenza. However, traditional PCR tests have a slow turnaround time and cannot deliver results soon enough to influence the clinical decision making. The Detroit Medical Center (DMC) implemented the Xpert Flu test for all patients presenting with influenza-like illness (ILI). We evaluated antibacterial use after implementation of rapid influenza PCR Xpert Flu. **Methods:** We conducted a retrospective study comparing all pediatric and adult patients tested using traditional RT PCR during the 2017–2018 flu season to patients tested using the rapid influenza Xpert Flu during the 2018–2019 flu season in a tertiary-care hospital in Detroit, Michigan. These patients were further divided into 3 groups: not admitted (NA), admitted to acute-care floor (ACF), or admitted to intensive care unit (ICU). The groups were then compared with respect to percentage of antibacterial use after traditional RT PCR versus rapid influenza Xpert Flu testing during their hospital visit for ILI. The χ^2 test was used for statistical analyses. **Results:** In total, 20,923 patients presented with influenza-like illness during the study period: 26% (n = 5,569) had the rapid influenza Xpert Flu and 73.4% (n= 15,354) had traditional RT PCR. For a comparison of the number of patients in 3 groups (NA, ACF, and ICU) and type of influenza PCR performed among these patients, please refer to Table 1. When comparing antibacterial use in the NA group, the proportions of patients who received antibacterial agents in the traditional RT PCR group versus the rapid influenza Xpert Flu group were 24.4% (n = 695) versus 3.9% (n = 450), respectively ($P < .0001$). In the ACF group, the proportions of patients who received antibacterial agents in the traditional RT PCR group versus the rapid influenza Xpert Flu group was 62.3% (n = 1,406) versus 27.7% (n = 994), respectively ($P < .001$). In the ICU group, the proportions of patients who received antibacterials in the traditional RT PCR group versus the rapid influenza Xpert Flu group were 80.3% (n = 382) versus 38.3% (n = 204), respectively ($P < .0001$). **Conclusions:** With rising antimicrobial resistance and increasing influenza morbidity and mortality, rapid diagnostics not only can help diagnose influenza faster but also can reduce inappropriate antimicrobial use.

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Real-Time Bedside Root Cause Analysis (RCA) as a Catalyst for *Clostridioides difficile* Reduction

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Table 1: Total Number of Patients in Each Group and Type of Influenza PCR Performed

Group	Traditional Flu PCR (TF) n (%)	Rapid Influenza Xpert® Flu (RT) n (%)	Total n (%)
Not admitted group (NA)	2837 (20%)	11,287 (80%)	14,124 (67.5%)
Acute Care group (ACF)	2256 (38.9%)	3534 (61%)	5790 (27.6%)
Intensive Care Unit group (ICU)	476 (47.2%)	533 (52.8%)	1009 (4.8%)

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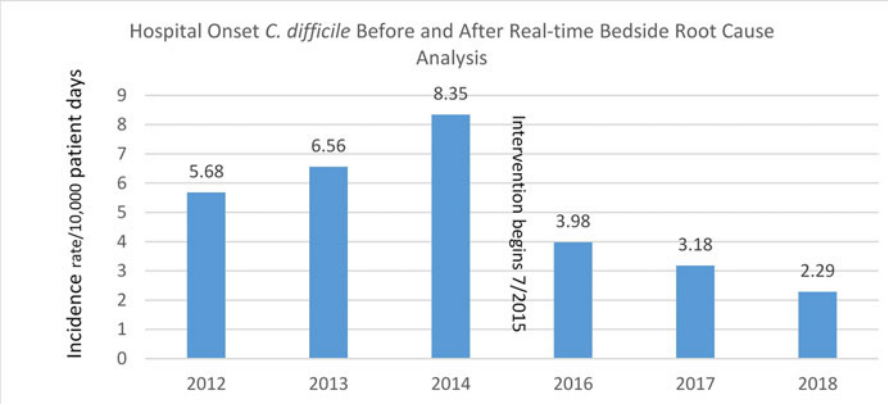

Fig. 1.

Background: *C. difficile* infection has been a significant cause of morbidity and mortality over the past decade. Our hospital had rates of hospital-onset, laboratory-identified, *C. difficile* infection (HO-CDI) that were significantly higher than our state and national benchmarks. HO-CDI is defined as a test positive for *C. difficile* occurring on or after day 4 of hospitalization, regardless of the presence of symptoms. New leadership at the hospital sought a creative way to engage staff in finding solutions to our high rates of HO-CDI. **Objective:** The purpose of this intervention was to engage frontline staff in reporting and solving patient care situations that may increase infection risk to decrease HO-CDI rates. **Methods:** Starting in July 2015, real-time bedside RCAs were performed weekly for any HO-CDI on the unit to which the infection was attributed and on any unit from which the patient had been recently transferred. Top clinical leadership of the hospital, and all services and departments, physicians, nurses, and others involved with the patient's care were expected to attend and identify factors that may have contributed to the infection. The findings were documented, and changes to care were made based on the findings. The rate of incident hospital onset HO-CDI per 10,000 patient days was used to measure outcome because standardized infection ratios for the period before 2016 were not available. **Results:** Staff members suggested 6 specific actions that were undertaken to decrease HO-CDI risk (Table 1). The HO-CDI rate during the preintervention period (2012–2014) was 6.85 per 10,000 patient days (275 cases). In the postintervention period (2016–2018) the HO-CDI rate was 3.13 per 10,000 patient days (101 cases). There was a 54% reduction in the HO-CDI rate in the postintervention period ($P < .001$). **Conclusions:** The multidisciplinary bedside RCA process resulted in staff providing recommendations for actions to reduce HO-CDI risk. Implementation of staff suggestions resulted in a sustained, significant decrease in HO-CDI.

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Real-Time Identification of Patients Included in the CMS Bundled Payment Care Improvement (BPCI) Program

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Background: The Bundled Payment Care Improvement Program is a CMS initiative designed to encourage greater collaboration across settings of care, especially as it relates to an initial set of targeted clinical episodes, which include sepsis and pneumonia. As with many CMS incentive programs, performance evaluation is retrospective in nature, resulting in after-the-fact changes in operational processes to improve both efficiency and quality. Although retrospective performance evaluation is informative, care providers would ideally identify a patient's potential clinical cohort during the index stay and implement care management procedures as necessary to prevent or reduce the severity of the condition. The primary challenges for real-time identification of a patient's clinical cohort are CMS-targeted cohorts are based on either MS-DRG (grouping of ICD-10 codes) or HCPCS coding—coding that occurs after discharge by clinical abstractors. Additionally, many informative data elements in the EHR lack standardization and no simple and reliable heuristic rules can be employed to meaningfully identify those cohorts without human review. **Objective:** To share the results of an ensemble statistical model to predict patient risks of sepsis and pneumonia during their hospital (ie, index) stay. **Methods:** The predictive model uses a combination of Bernoulli Naïve Bayes natural language processing (NLP) classifiers, to reduce text dimensionality into a single probability value, and an eXtreme Gradient Boosting (XGBoost) algorithm as a meta-model to collectively evaluate both standardized clinical elements alongside the NLP-based text probabilities. **Results:** Bernoulli Naïve Bayes classifiers have proven to perform well on short text strings and allow for highly explanatory unstructured or semistructured text fields (eg, reason for visit, culture results), to be used in a both comparative and generalizable way within the larger XGBoost model. **Conclusions:** The choice of XGBoost as the meta-model has the benefits of mitigating concerns of nonlinearity among clinical features, reducing potential of overfitting, while allowing missing values to exist within the data. Both the Bayesian classifier and meta-model were trained using a

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