on Dutch neonatal CLABSI surveillance criteria, which are summarized in Figure 2. Neonatal CLABSI is defined as a bloodstream infection occurring >72 hours after birth, associated with an indwelling central venous or arterial line and laboratory confirmed by 1 or more blood cultures. In addition, the blood culture finding should not be related to an infection at another site and one of the following criteria can be applied: (1) a bacterial or fungal pathogen is identified from 1 or more blood cultures; (2) the patient has clinical symptoms of sepsis and (2A) a common commensal is identified in 2 separate blood cultures or (2B) a common commensal is identified by 1 blood culture and C-reactive protein (CRP) level is >10 mg/L in the first 36 hours following blood culture collection. **Conclusion:** The newly developed Dutch neonatal CLABSI surveillance criteria are concise, are specific to the neonatal population, and comply with a single blood-culture policy in actual neonatal clinical practice. International agreement upon neonatal CLABSI surveillance criteria is needed to identify best practices for infection prevention and control.

Funding: No

Disclosures: None

Antimicrobial Stewardship & Healthcare Epidemiology 2021;1(Suppl. S1):s7–s8
doi:10.1017/ash.2021.14

Presentation Type:
Poster Presentation - Top Poster Award
Subject Category: COVID-19

Does Every Patient with a Positive SARS-CoV-2 RT-PCR Test Require Isolation? A Prospective Analysis

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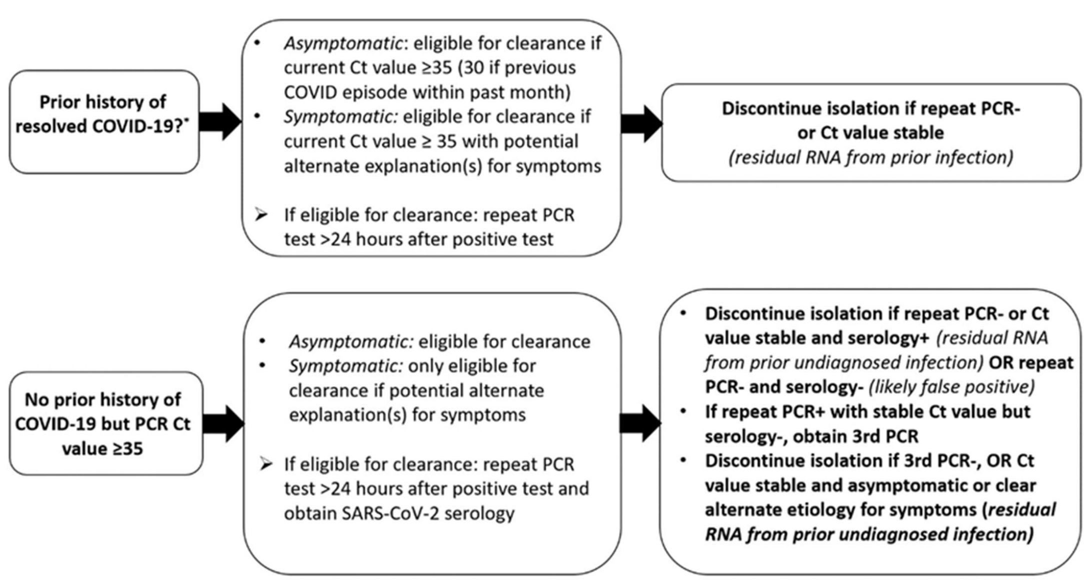
Group Name: CDC Prevention Epicenters Program

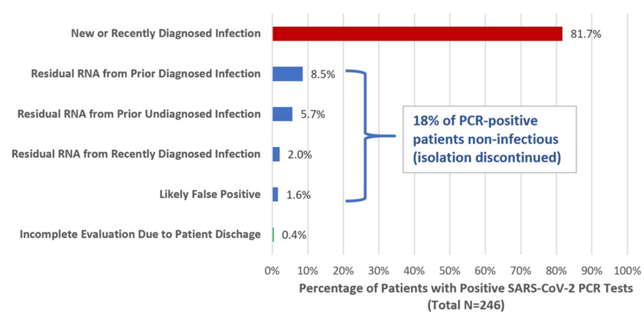
Background: **Reverse**-transcriptase polymerase chain reaction (RT-PCR) tests are the reference standard for diagnosing SARS-CoV-2 infection, but false positives can occur and viral RNA may persist for weeks-to-months following recovery. Isolating such patients increases pressure on limited hospital resources and may impede care. Therefore, we quantified the percentage of patients who tested positive by RT-PCR yet were unlikely to be infectious and could be released from isolation. **Methods:** We prospectively identified all adults hospitalized at Brigham and Women's Hospital (Boston, MA) who tested positive for SARS-CoV-2 by RT-PCR (primarily Hologic Panther Fusion or Cepheid Xpert platforms) between December 24, 2020, and January 24, 2021. Each case was assessed by infection control staff for possible discontinuation of isolation using an algorithm that incorporated the patient's prior history of COVID-19, current symptoms, RT-PCR cycle threshold (Ct) values, repeat RT-PCR testing at least 24 hours later, and SARS-CoV-2 serologies (Figure 1). **Results:** Overall, 246 hospitalized patients (median age, 66 years [interquartile range, 50–74]; 131 [53.3%] male) tested positive for SARS-CoV-2 by RT-PCR during the study period. Of these, 201 (81.7%) were deemed new diagnoses of active disease on the basis of low Ct values and/or progressive symptoms. Moreover, 44 patients (17.9%) were deemed noninfectious: 35 (14.2%) had prior known resolved infections (n = 21) or unknown prior infection but positive serology (n = 14), high Ct values on initial testing, and negative or stably high Ct values on repeat testing. Also, 5 (2.0%) had recent infection but >10 days had passed since symptom onset and they were clinically improving. In addition, 4 (1.6%) results were deemed false positives based on lack of symptoms and at least 1 negative repeat RT-PCR test (Figure 2). One patient was asymptomatic with Ct value <35 but was discharged before further testing could be obtained. Among the 44 noninfectious patients, isolation was discontinued a median of 3 days (IQR, 2–4) after the first positive test. We did not identify any healthcare worker infections attributable to early discontinuation of isolation in these patients. **Conclusions:** During the winter COVID-19 second surge in Massachusetts, nearly 1 in 5 hospitalized patients who tested positive for SARS-CoV-2 by RT-PCR were deemed noninfectious and eligible for discontinuation of precautions. Most of these cases were consistent with residual RNA from prior known or undiagnosed infections. Active

Figure 1. Algorithm for evaluating patients with positive SARS-CoV-2 RT-PCR tests for potential discontinuation of transmission-based precautions



*"Resolved" COVID-19 refers to a prior infection for which isolation had previously been discontinued. PCR+ patients with recently diagnosed and unresolved COVID-19 infection were assessed for potential discontinuation of isolation based on time/symptom-based criteria (10 days for asymptomatic or mild infections, or 20 days for severe infections or immunocompromised patients + clinical improvement for symptomatic patients).

Figure 2. Assessments of Positive SARS-CoV-2 RT-PCR Tests in Hospitalized Patients



assessments of SARS-CoV-2 RT-PCR tests by infection control practitioners using clinical data, Ct values, repeat tests, and serologies can safely validate the release many patients from isolation and thereby conserve resources and facilitate patient care.

Funding: No

Disclosures: None

Antimicrobial Stewardship & Healthcare Epidemiology 2021;1(Suppl. S1):s8–s9

doi:10.1017/ash.2021.15

Presentation Type:

Poster Presentation - Top Poster Award

Subject Category: COVID-19

Model Input and Optimization: Improving the Speed and Accuracy of Our COVID-19 Hospitalization Forecasts

Sarah Rhea; Emily Hadley; Kasey Jones; Alexander Preiss; Marie Stoner; Caroline Kery; Peter Baumgartner and Alex Giarrocco

Background: During the COVID-19 pandemic, public-health decision makers have increasingly relied on hospitalization forecasts that are routinely provided, accurate, and based on timely input data to inform pandemic planning. In North Carolina, we adapted an existing agent-based model (ABM) to produce 30-day hospitalization forecasts of COVID-19 and non–COVID-19 hospitalizations for use by public-health decision makers. We sought to continually improve model speed and accuracy during forecasting. **Methods:** The geospatially explicit ABM included movement of agents (ie, patients) among 104 short-term acute-care hospitals, 10 long-term acute-care hospitals, 421 licensed nursing homes, and the community in North Carolina. Agents were based on a synthetic population of North Carolina residents (ie, >10.4 million agents). We assigned SARS-CoV-2 infections to agents according to county-level susceptible, exposed, infectious, recovered (SEIR) models informed by reported COVID-19 cases by county. Agents' COVID-19 severity and probability of hospitalization were determined using agent-specific characteristics (eg, age, comorbidities). During May 2020–December 2020, we produced weekly 30-day forecasts of intensive care unit (ICU) and non-ICU bed occupancy for COVID-19 agents and non–COVID-19 agents statewide and by region under a range of SARS-CoV-2 effective reproduction numbers. During the reporting period, we identified optimizations for faster results turnaround. We evaluated the incorporation of real-time hospital-level occupancy data at model initialization on forecast accuracy using mean absolute percent error (MAPE). **Results:** During May 2020–December 2020, we provided 31 weekly reports of 30-day hospitalization forecasts with a 1-day turnaround time. Reports included (1) raw and smoothed 7-day average values for 42 model output variables; (2) static visuals of ICU and non-ICU bed demand and capacity; and (3) an interactive Tableau workbook of hospital demand variables. Identifying code efficiencies reduced a single model runtime from ~100 seconds to 28 seconds. The use of cloud computing reduced simulation runtime from ~20 hours to 15 minutes. Across forecasts, the average MAPEs were 21.6% and 7.1% for ICU and non-ICU bed demand, respectively. By incorporating hospital-level occupancy data, we reduced the average MAPE to 6.5% for ICU bed demand and 3.9% for non-ICU bed demand, indicating improved accuracy. **Conclusions:** We adapted an ABM and continually improved it during COVID-19 forecasting by optimizing code and computing resources and including real-time hospital-level occupancy data. Planned SEIR model updates for enhanced forecasts include the addition of compartments for undocumented infections and recoveries as well as permission of reinfection from recovered compartments.

Funding: No

Disclosures: None

Antimicrobial Stewardship & Healthcare Epidemiology 2021;1(Suppl. S1):s9

doi:10.1017/ash.2021.16

Presentation Type:

Poster Presentation - Top Poster Award

Subject Category: COVID-19

Retrospective Study on Personal Protective Equipment During Pandemic Link to Outbreak of Carbpenem-Resistant Enterobacteriace

Kenisha Evans; Jennifer LeRose; Angela Beatriz Cruz; Lavina Jabbo and Teena Chopra

Background: In 2019, according to the Centers for Disease Control and Prevention, carbapenem-resistant Enterobacteriaceae (CRE), had cost the lives of >35,000 patients, particularly the most virulent plasmid-mediated New Delhi metallo-β-lactamase (NDM). Although healthcare systems normally have strict surveillance and infection control measures for CRE, the rapid emergence of novel SAR-CoV-2 and COVID-19 led to a shortage of personal protective equipment (PPE) and medical supplies. As a result, routine infection practices, such as contact precautions, were violated. Studies have shown this depletion and shift in resources compromised the control of infections such CRE leading to rising horizontal transmission. **Method:** A retrospective study was conducted at a tertiary healthcare system in Detroit, Michigan, to determine the impact of PPE shortages during the COVID-19 pandemic on NDM infection rates. The following periods were established during 2020 based on PPE availability: (1) pre-PPE shortage (January–June), (2) PPE shortage (July–October), and (3) post-PPE shortage (November–December). Rates of NDM per 10,000 patient days were compared between periods using the Wilcoxon signed rank-sum test. Isolates were confirmed resistant by NDM by molecular typing performed by the Michigan State Health Department. Patient characteristics were gathered by medical chart review and patient interviews by telephone. **Results:** Overall, the average rate of NDM infections was 1.82 ±1.5 per 10,000 patient days. Rates during the PPE shortage were significantly higher, averaging 3.6 ±1.1 cases per 10,000 patient days (P = .02). During this time, several infections occurred within patients on the same unit and/or patients with same treating team, suggesting possible horizontal transmission. Once PPE stock was replenished and isolation practices were reinstated, NDM infection rates decreased to 0.77 ±1.1 per 10,000 patient days. **Conclusion:** Control of CRE requires strategic planning with active surveillance, antimicrobial constructs, and infection control

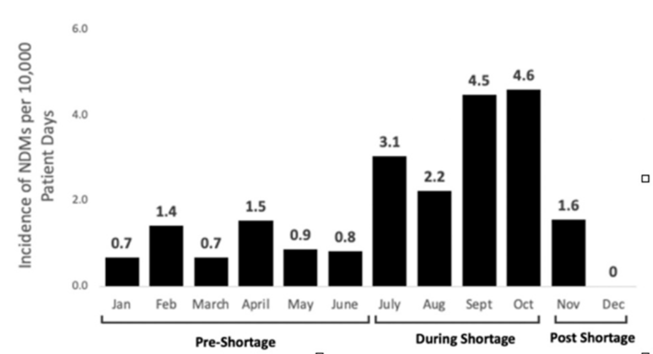


Figure 1.