Methods. We designed a simulation model of CDI among patients in a network of 10 short- and long-term acute care hospitals and nursing homes. Model calibration relied on published infection and carriage data and whole genome sequencing studies that estimated the fraction of CDI attributable to transmission from other CDI patients in healthcare settings. The modeled vaccine effectiveness for reducing the rate of progression to CDI among carriers was set at 75%, achieved after completing a vaccine course. We then simulated initiation of this vaccine course to a random subset of patients at transfer or live discharge and tallied direct and indirect CDI-reduction effects per vaccinated patient over 5 years.

Results. Model calibration found that data are consistent with higher infectivity of CDI patients over other carriers by a factor of 30–85, depending on assumed rates of initial carriage importation. Vaccine simulations produced an average reduction of 36 CDI cases per 1,000 vaccinated patients, with 25 of those cases prevented among those vaccinated and 11 prevented among unvaccinated patients. These results were robust across transmission and carriage rates supported by data.

Conclusion. Our findings demonstrate potential for a vaccine against CDI to reduce transmissions in healthcare facilities, even if it does not decrease acquisition of carriage per exposure among those receiving it. The finding is robust to the remaining uncertainty around the relative prevalence and infectivity of CDI patients among all carriers. The vaccine will have maximal impact if received by individuals likely to experience future infections in settings where environmental contamination poses risk to others.

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519. Longer Length of Antibiotic Therapy for Community-Acquired Pneumonia and Risk of *Clostridium difficile* Infection

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Background. We previously observed a median 9.5 days length of antibiotic therapy (LOT) among patients with community-acquired pneumonia (CAP) requiring hospitalization (Clin Infect Dis. 2018;66:1333–41). Treatment guidelines for CAP, however, suggest LOT >7 days is rarely necessary. In this study, we evaluated the risk of *Clostridium difficile* infection (CDI) as a potential harm of longer LOT.

Methods. This retrospective cohort study included Medicare beneficiaries with parts A, B, and D coverage hospitalized for uncomplicated CAP in 2012–2013 for 2–10 days, home discharge, and no hospitalizations 30 days before or 3 days after index hospitalization. The main exposure was total LOT, represented by the sum of estimated inpatient and observed outpatient LOT, and defined as "longer" if >9.5 days and "shorter" if ≤9.5 days. The outcome, post-discharge CDI, was defined using ICD-9-CM diagnosis code 008.45 in inpatient, skilled nursing, or outpatient claims within 6 months after index hospitalization. CDI 12 months before or during index hospitalization was excluded. CDI risk was assessed through a multivariable logistic model stratified by outpatient antibiotic class and adjusted for confounders including comorbidities, severity via ICU status, demographics, and hospital characteristics.

Results. The cohort consisted of 99,883 patients. Median total LOT was 9.5 days (IQR: 7.4–11.4). Antibiotics filled at discharge included quinolones (40%), none (20%), multiple (14%), cephalosporins (10%), macrolides (7%), and β-lactam/β-lactamase inhibitor combinations (5%). CDI risk was 1.2%. Overall adjusted risk among those with longer LOT was 1.2 (95% CI: 1.1–1.4) times that of those with shorter LOT. Increased risk was observed among those prescribed quinolones at discharge, for whom adjusted CDI risk for longer LOT was 1.4 (95% CI: 1.2–1.7) times the risk of those with shorter LOT. We observed no difference in risk between longer and shorter LOTs for other antibiotic categories.

Conclusion. These findings suggest that decreased LOT, which can be achieved with better adherence to current treatment guidelines, could reduce risk of subsequent CDI among patients hospitalized with CAP, particularly among those treated with fluoroquinolones at discharge.

Disclosures. **All authors:** No reported disclosures.

520. Reducing Inappropriate *Clostridium difficile* Testing by Empowering Nurses

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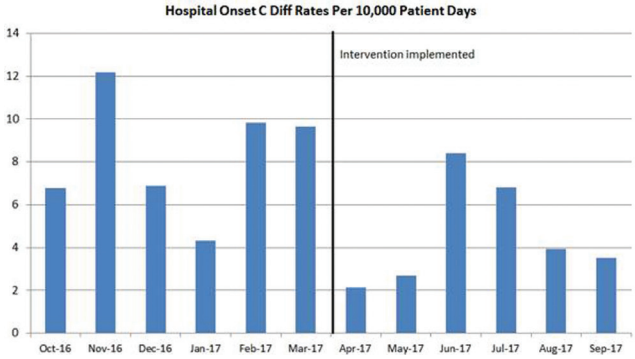
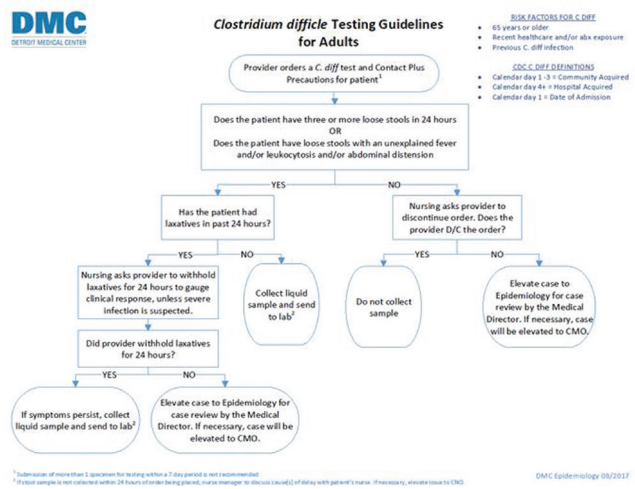
Background. Inappropriate testing for *Clostridium difficile* (CD) can result in over diagnosing, which may lead to overuse of antibiotics, increased length of stay and financial penalties under Center for Medicare and Medicaid's Value Based Programs. To address unnecessary testing, a nurse-driven algorithm was developed and implemented at a tertiary teaching hospital in Detroit, Michigan. In this study, we evaluate the intervention's impact on hospital acquired CD infections (HO-CDI) rates.

Methods. An algorithm for CD testing appropriateness was created by leadership and the Infection Prevention team. The algorithm emphasized that CD testing should not be performed on asymptomatic patients or those receiving laxatives and/or stool softeners. Rates of HO-CDI per 10,000 patient days were compared before and after the intervention and statistical significance was determined by an unpaired *t*-test. The hospital laboratory used PCR to detect CD throughout the study period.

Results. Before the algorithm was implemented, our hospital had an average of 8.2 HO-CDI per 10,000 patient days. After the intervention was established, the rate decreased to 4.6 HO-CDI per 10,000 patient days. This represents a statistically significant decrease in HO-CDI ($P = 0.037$). The rate of community-onset CD cases, defined as infection that are identified between calendar day 1 through 3, did not change significantly during the study ($P = 0.65$).



Conclusion. Empowering and educating nurses about CD testing guidelines proved to be an effective tactic to reduce unnecessary CD testing, and in turn, decrease our HO-CDI rates.



Disclosures. **All authors:** No reported disclosures.

521. *Clostridium difficile* Timeout: A Nurse-Driven Protocol to Optimize Testing Stewardship

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Background. There remains a challenge in distinguishing colonization vs. infection with *Clostridium difficile* associated diarrhea. At our institution, despite effective antimicrobial stewardship efforts, *C. difficile* tests and positive infections remained high identifying a need for *C. difficile* testing stewardship optimization.

Methods. This was an IRB approved study on a nursing driven algorithm for *C. difficile* Timeout (CDT). This included the number and shape of stools and absence of laxatives in the last 24 hours. Control and study groups were identified and a nurse