CDI defined as diarrhea (≥3 loose stools over 24 hours) without laxatives. LabID HO CDI standardized infection ratios were tracked.

Results. Ongoing review of response to CDS alerts led to changes in the algorithm (Table 1). Inaccurate interpretation of indeterminate tests were corrected and a notification the laboratory would reject repeat tests and formed stool despite overriding a cancellation was added. Evaluation of declinations for unhelpful triggers led to modification of the laxative list (e.g., removed bulk forming agents) which decreased laxative declinations from 75–79% to 54%. Changes to the CDS did not drop the rate of alerts (3.8 to 3.6 on average per day) and providers continue to test for inappropriate indications. Review of HO CDI cases (Table 2) show patients without diarrhea continue to be tested (21% pre- vs. 32% post-CDS), but more of those with diarrhea have not been on laxatives (38% pre, 60% post). Pre to post-CDS, the HO CDI SIR has started to drop (Figure 1).

Conclusion. CDS with provider prompting improved ordering practices for CDI, but iterative changes to the tool were needed. Additional steps, such as enforcing hard stops should be explored. Greater nurse involvement, as with standardized discrete documentation to capture diarrhea, would enhance testing algorithms.

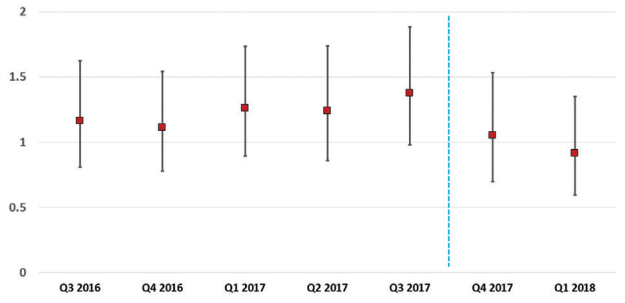
TABLE 1

Computerized Decision Support Phase	Phase 1 [53 days]	Phase 2 [63 days]	Phase 3 [53 days]
Description of changes made	– Initial algorithm	– Correct false + PCR trigger – Add verbiage that lab rejects repeat tests despite provider override	– Remove tube feeds initiated trigger – Narrow laxative list
Alert category at episode order decision no. (% declined)			
– Tube feeds started	16 (81%)	10 (90%)	Removed
– Previous positive test 14 days	7 (43%)	5 (20%)	7 (57%)
– Previous negative test 7 days	16 (56%)	19 (68%)	32 (53%)
– Laxatives given previous 48 hours	88 (75%)	66 (79%)	84 (54%)
Total Alerts/Day	3.8	3.8	3.6
Ordering Episodes/Day	1.6	1.6	1.4
Examples of Reasons for Declination	Want test despite lack of symptoms: – *"Because"* – *"This is the test we want"* – *"Per Dr. Whoever"* Do not recognize appropriate disease: – *"No stool x 3 days"* – *"Has clostridium wound infection"* (*C. perfringens*) As part of gun-shot approach even without symptoms: – *"Leukocytosis"* – *"Rule out infection in immunocompromised patient"*		

TABLE 2

Computerized Decision Support	PRE (over 16 weeks)	POST (over 22 weeks)
LabID HO CDI Events, no.	42	50
≥ 3 new loose stools prior 24 hours, no. (% of HO CDI)	33 (79%)	34 (68%)
Diarrhea without laxatives prior 48 hours, no. (% of HO CDI)	16 (38%)	30 (60%)

Figure 1: HO CDI Standardized Infection Ratios (SIR) and 95%CI



NHSN SIR for HO CDI during each quarter represented by red squares with corresponding 95% Confidence Intervals
Computerized Decision Support at order entry was initiated late Sept 2017 as shown by the blue hatched line

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

525. The Impact of Switching to Molecular Testing on *Clostridium difficile* Infection Rates: Large-Scale Assessment Using an Interrupted Time Series Poisson Regression Approach

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Session: 59. Healthcare Epidemiology: Updates in *C. difficile*
Thursday, October 4, 2018: 12:30 PM

Background. *Clostridium difficile* is the most common cause of hospital-acquired infections in the United States, affecting over 500,000 patients per year at a cost of nearly $5 billion. The reported incidence of *C. difficile* infections (CDIs) has increased in recent years, partly due to broad adoption of polymerase chain reaction (PCR) testing replacing enzyme-linked immunosorbent assay (ELISA) methods. Our aim was to assess the contribution of this change on reported CDI incidence using a large-scale empirical data set.

Methods. We retrospectively analyzed 8 years of CDI surveillance data (2009–2016) collected from 47 hospitals in the Duke Infection Control Outreach Network. During this period, 24 hospitals switched to PCR testing, 10 used ELISA throughout, and 13 used PCR throughout. We used interrupted time series analysis to quantify the relative change in incidence rate (IRR) of CDIs due to the switch from nonmolecular (ELISA) to molecular (PCR) testing. Data were aligned across hospitals at their interruption point, set at the reported test change date or nearest available measurement. Individual hospital and network-wide estimates of the PCR-over-ELISA IRR were determined through Poisson regression, controlling for total patient days, proportion of intensive care unit patient-days as a proxy for acuity, background trends, and previously detected clusters.

Results. Average monthly CDI rates significantly increased after the test change from 11.7 to 26.8 per 10,000 patient-days in hospitals that switched to PCR testing. A similar difference was observed between ELISA-only and PCR-only hospitals, which averaged 12.7 and 21.0 CDIs per 10,000 patient-days, respectively. Regression analysis yielded hospital-specific test change IRRs ranging from 0.70 (95% confidence interval [CI]: 0.48–1.02) to 3.64 (CI: 2.77–8.46) (Figure 1) and a network-wide IRR of 1.79 (CI: 1.73–1.90). Results also found an increasing background trend of 0.9 CDIs per 10,000 patient-days per year (CI: 0.7–1.2) (Figure 2), as well as a significant effect of known clusters (IRR of 1.56, CI: 1.48–1.65).

Conclusion. Hospitals that switched to molecular testing experienced an average post-change increase of 80% in reported CDI rates, similar to that observed during known cluster periods.

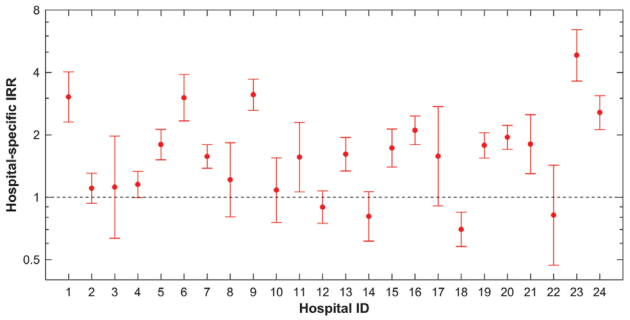

Figure 1. Hospital-specific estimates of relative changes in incidence rates (IRR) of *Clostridium difficile* infections due to switching from non-molecular (enzyme-linked immunosorbent assay) to molecular (polymerase chain reaction) diagnostic testing. Note *y*-axis is on a logarithmic scale. Error bars denote standard errors. IRRs > 1 indicate increases in reported *C. difficile* rates.

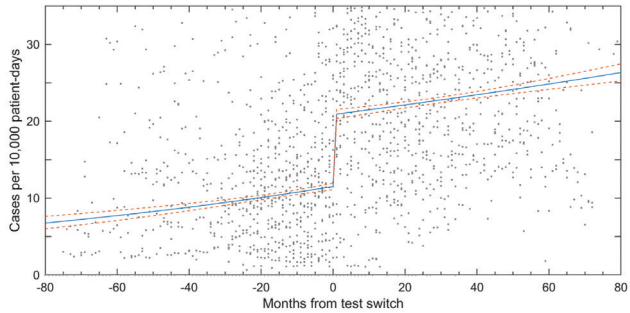

Figure 2. Network-wide model of the effect of switching from non-molecular to polymerase chain reaction diagnostic testing on reported incidence rates of *C. difficile* infections. Regression fit (continuous line) assumes no infection clusters and a fixed ratio of 12% intensive care unit-days per total patient days (network average). Dashed lines denote 95% confidence intervals. Dots indicate individual monthly observations from the 24 hospitals that switched.

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

526. An EMR-Based Diagnostic Stewardship Intervention for GI mPCR Aimed at Reducing Inappropriate *C. difficile* Tests

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Session: 59. Healthcare Epidemiology: Updates in *C. difficile*
Thursday, October 4, 2018: 12:30 PM

Background. Diagnostic stewardship is an emerging tool that can be used to prevent overuse of diagnostics. Because GI mPCR (GI multiplex PCR panel) tests can be ordered

on formed stool, the test has lower pre-test probability for *Clostridium difficile* (*C. difficile*) infection than traditional singleplex PCR. Furthermore, after 48hours of admission, most other targets on the GI mPCR are no longer clinically relevant. Any *C. difficile* testing on inappropriate specimens may increase the rate of Lab ID events (positive *C. difficile* tests after 3 days of admission) without improving detection of true infections.

Methods. In January 2018, our 700-bed academic medical center implemented an informatics-based intervention that restricted ordering of the GI mPCR to the first 48 hours of hospitalization. After 48 hours, providers were required to contact microbiology to request an exception (see Figure 1). Singleplex PCR testing for *C. difficile* was available throughout admission. Orders for the GI mPCR test require the provider to note whether the patient had >3 loose stools in the previous day. Statistical analysis performed with STATA software.

Results. A total of 282 late (after 48 hours of admission) GI mPCR tests were ordered in the 104 days before restriction and 210 late tests were ordered in the 104 days after. Late GI mPCR tests (before and after restriction) resulted in diagnoses other than *C. difficile* less than 5% of the time (20 of 492 tests). 11.7% (24 of 210) of late GI mPCR tests were ordered for patients who did *not* have >3 loose stools in the previous day. Prior to restriction, 15% (41 of 282) of Lab ID events from GI mPCR were for patients who had already tested positive for *C. difficile* earlier in the same admission. Following the intervention, there was a decreased proportion of GI mPCR tests that were positive for *C. difficile* (from 14.5% to 11.3%, $P = 0.26$), as well as a significantly decreased rate of Lab ID events detected by GI mPCR, from 7.2/10,000 patient days to 4.0/10,000 patient days ($P = 0.01$).

Conclusion. Accurate diagnosis of *C. difficile* infection is important for treatment and prevention efforts, yet these data show that many rapid GI mPCR tests are inappropriately ordered on patients who may not have loose stools and who are unlikely to have an alternate diagnosis. EMR-based restriction on the GI mPCR ordering time reduced Lab ID events of *C. difficile* infection without missing important alternate diagnoses.

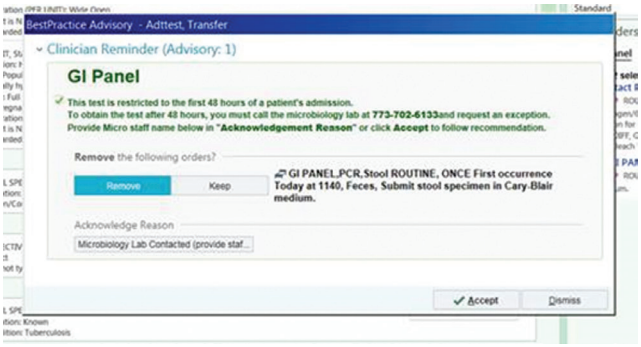

Figure 1.

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

527. New Robust Antimicrobial Stewardship Program (ASP) Results in Reduction of *Clostridium difficile* 30-Day Readmission

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Session: 59. Healthcare Epidemiology: Updates in *C. difficile*
Thursday, October 4, 2018: 12:30 PM

Background. As the pipeline for antibiotics is decreasing and antibiotic resistance is increasing, it is critically important to be stewards of antibiotics. ASP has become a mandated program as of January of 2017 by Joint Commission and condition of participation for CMS on reimbursement. A pilot program of *C. difficile* treatment in the academic medical center proved to be quite useful to adapt to a larger healthcare system.

Methods. A dedicated Infectious Disease physician and three Antibiotics stewardship pharmacists (ASP) were hired to run this program. Goals of the program was to decrease broad-spectrum antibiotics use, and reduce *Clostridium difficile* readmission (CDR) for the healthcare system. Performance of CDR for each inpatient was accomplished with ASP making recommendations for treatment. Queries were built into the ASP software and alerts were generated in the electronic medical record (EMR). CDR was targeted daily for ASP pharmacists/ID physician. Comparison of fiscal year 2017 (control group) with 2018 (intervention group) was performed.

Results. CDR was reduced (control group 17.53% vs. intervention group 14.12%), respectively, for our healthcare system ($P > 0.05$). However, overall cost savings for the healthcare system was $1.3 million was realized. In the academic medical center specifically, with over 400 beds there was a significant reduction in CDR (control group 21% to intervention group 10.5% ($P < 0.05$). Cost savings estimated from CDR were $610,923. Finally, length of stay was reduced by 1 day for inpatients with *C. difficile* admission in the academic medical center.

Conclusion. ASP not only has immediate impact on patient care and safety but also can play a large role in treating the appropriate disease state and reduces unnecessary readmission to the acute care hospitals in our healthcare system.

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

528. Lab Stewardship for *Clostridium difficile* Testing Improves Appropriate Testing While Decreases Unnecessary Testing and Saves Laboratory Resources While Dramatically Helping to Reduce C diff Standardized Infection Ratios (SIR)

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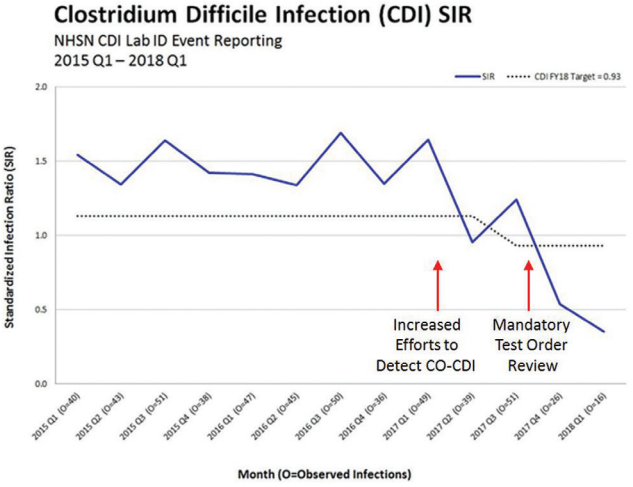
Session: 59. Healthcare Epidemiology: Updates in *C. difficile*
Thursday, October 4, 2018: 12:30 PM

Background. Unnecessary testing for *Clostridium difficile* infection (CDI) can be both wasteful and contra productive—retesting the same positive patient after transfer to a new nursing unit will only to confirm the patient has CDI (already known) and likely be classified as a new case of hospital-onset (HO) CDI. Yet, it is also important to recognize community-onset (CO) CDI in hospital, not only because it prevents late recognition of CO CDI as being classified as an HO event, will also to afford appropriate contact precautions and therapeutic measures are instituted in a timely fashion. Laboratory stewardship (LS) can be helpful in improving appropriateness of *C. difficile* testing.

Methods. We developed 2 CDI testing algorithms. One focused on hospital days 1–3, the other for all *C. difficile* testing after hospital day 3 (AHD3). The LS quality improvement (QI) project was rolled out in 2 stages. During the first 6 months we focused on improving early detection of CO-CDI, while during the next 6 months a mandatory review of all *C. difficile* testing orders AHD3 was conducted by a 10 person team. Testing that concurred with the algorithm was approved. Nonapproval was communicated to the care teams. Appeals could be made on a case-by-case basis to the medical director of infection control. Validation audits of nonapproved cases were performed to determine whether testing algorithms were sound.

Results. CO-CDI detection steadily increased over the yearlong LS QI period (average of 6 cases/week at start vs. 12 cases/week at year's end). During the 6 months of the AHD3 mandatory order review 678 *C. difficile* orders were placed, 428 (63.1%) were approved, 250 (36.9%) were rejected. Reduced use of laboratory resources is estimated to have saved $14,950. LS and frequent communication with care teams contributed better recognition of CO-CDI, decreased inappropriate repeat testing, avoidance of diagnosing colonized patients as HO-CDI and was associated with a significantly drop our CDI SIR (Figure 1).

Conclusion. An algorithm-based guideline for a 2-step LS QI program focused on reviews of all *C. difficile* orders AFHD3 as well as improving early detection of CO-CDI and was associated with better laboratory resource utilization and markedly decreased *C. difficile* SIR. Efforts are currently underway to automate much of the review process.



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529. Overdiagnosis of *Clostridioides difficile* with a Multiplex PCR Panel

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Session: 59. Healthcare Epidemiology: Updates in *C. difficile*
Thursday, October 4, 2018: 12:30 PM