CDI defined as diarrhea (≥2 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 form stool despite overriding a cancelation 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 vs. 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

| Description of changes made | Phase 1 (31 days) | Phase 2 (31 days) | Phase 3 (31 days) |
|-----------------------------|------------------|------------------|------------------|
| Initial algorithm           |                  |                  |                  |
| Correct error i.e. PCR trigger | Add warning to lab report to destripe provider override | Remove late level test to destripe provider override |
| New category of episode order decision no (2% decline) |                  |                  |                  |
| - Tube tests started         | 14 (91%)         | 15 (91%)         | 15 (91%)         |
| - Previous positive ≤14 days | 14 (91%)         | 15 (91%)         | 15 (91%)         |
| - Previous negative ≤7 days  | 14 (91%)         | 15 (91%)         | 15 (91%)         |
| - Previous positive ≥14 days | 14 (11%)         | 10 (67%)         | 10 (67%)         |
| Total Activity               | 3.0              | 3.0              | 3.0              |
| Ordering Episode/Day         | 1.0              | 1.0              | 1.4              |

Table 2. Computerized Decision Support

| Computed 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 (80%) |
| 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

Figure 2: Hospital-specific estimates of relative changes in incidence rates (IRR) of Clostridium difficile infections due to switching from non-molecular 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.

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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.

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

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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...
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.

Disclosure. 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) (SIR) Jorge P Parada, MD, MPH, Dominique Wright, MPH, Sylvia Suarez-Ponce, BS, HCL, RN, CIC; Elaine Truol, MS, BSN, RN, CIC, Purisma Linchangco, MD, MPH, CIC, Avat Bhaloomid, MD, CIC, Hermosa Pua, RN, BSN, RN; CIC, Melissa Green, BA, Heather Hedlund, RN, Kevin R Smith, MD and Amanda Harrington, PhD; Loyola University Medical Center, Maywood, Illinois

Session: 59. Healthcare Epidemiology: Updates in C difficile
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Background. Unnecessary testing for Clostridium difficile infection (CDI) can be both wasteful and counterproductive—retesting the same positive patient after transfer to a new nursing unit will only 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, but 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 order review of all C difficile testing orders AHD3 was conducted by a 10 per 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 AHD3 as well as improving early detection of CO-CDI and associated with better laboratory economy and markedly decreased SIR. Efforts are currently underway to automate much of the review process.