Table 1: CD Toxin B PCR Ct Values Compared with FGP Result, Co-Pathogen Detection, and EIA Results

|                | Median Ct | Median Ct | P-value |
|----------------|-----------|-----------|---------|
| FGP+CD+ result released (n = 1) | 20.64 | 28.77 | NS      |
| FGP+CD+ only (n = 24) | 26.83 | 29.34 | NS      |
| EIA toxin+ (n = 14) | 23.23 | 31.11 | 0.0005  |

Disclosures. A. Leber, Nationwide Children’s Hospital. Research Contractor, Research support.

1092. Tuning Down Clostridioides difficile PCR Sensitivity Reduces Treatment for C. difficile Infection in Toxin-Negative Patients With No Increase in Adverse Outcomes
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Background. Studies have shown that toxin detection identifies those who require treatment for C. difficile infection (CDI) and free toxin can be predicted with high negative predictive value from PCR cycle threshold (CT). CT-toxin was introduced at our institution in two phases: from October 2016 to October 2017, CT-toxin was reported with the PCR result (split reporting) and CTDI therapy was discouraged if CT-toxin was negative (PCR+/CTtox−). Interim analysis showed that CDI treatment had no effect on outcomes in these CTtox− patients, so starting November 2017, only CT-toxin was reported. Outcomes in PCR+/CTtox− patients treated during split reporting and untreated during the toxin-only period are detailed here.

Methods. Patients tested from October 2016 to February 2018 with a positive Xpert tcdB PCR (Cepheid, Sunnyvale, CA) and CT-toxin− result were included. Clinical data were collected by retrospective chart review in the split reporting period and prospective review in the toxin-only period and analyzed using SPSS at α = 0.01.

Results. Of 186 unique PCR+/CTtox− patients during split reporting, 99 (53%) were treated, compared with 6 (12, n = 51) in the toxin-only period (P < 0.001). In comparing treated patients during split reporting to untreated patients during toxin-only reporting (n = 45), there were no significant differences in age, sex, prior antibiotic use, CDI in the previous 6 months, Charlson Comorbidity Index, patient location, immune status, or data at testing, including WBC count, creatinine, albumin, and stools/day. There were no cases of fulminant CDI in either group and no difference in outcomes (table).

Conclusion. Reporting of CT-toxin alone significantly reduced treatment for CDI compared with split reporting in CTtox− patients with no increase in adverse outcomes in short-term follow-up. Further study is needed to confirm these findings in a larger cohort.

Table: Outcomes in Patients With PCR+/CTtox− Result by Treatment Status and Reporting Period. Categorical Variables Are Denoted as n (%) and Continuous Variables as Mean [Standard Deviation]

| Outcomes                              | Split Reporting (Treated = n = 99) | CT-Toxin Only Reporting (Untreated = n = 45) | P-value |
|---------------------------------------|-----------------------------------|---------------------------------------------|---------|
| Days to diarrhea resolution           | 2.8 (1.9)                         | 2.2 (2.1)                                  | 0.2     |
| (<3 stools/day)                      |                                   |                                             |         |
| CTtox+ CDI within 8 weeks             | 8 (8.1)                           | 4 (8.9)                                    | 0.9     |
| 30-Day all-cause mortality            | 9 (9.1)                           | 3 (6.7)                                    | 0.8     |

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1093. Single Molecule Counting Technology for Ultra-sensitive Quantification of Clostridium difficile Toxins A and B
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Background. Clostridium difficile, a spore-forming, anaerobic, Gram-positive bacterium, is the leading cause of nosocomial diarrhea. C. difficile infection is mediated by two toxins, A (TcdA) and B (TcdB), and the role of each toxin in CDI pathogenesis remains unclear. Many assays used in CDI diagnostics, such as most NAATs and cell cytotoxicity neutralization assay (CCNA), detect presence of only tcdB or TcdB. In this study, an ultrasensitive immunoassay (UIA) powered by Single Molecule Counting technology was used for quantification of TcdA and TcdB, to assess toxin dynamics in CDI.

Methods. Banked samples from 46 patients with suspected CDI were tested with PCR (BD MAXâ"¢ Cefid Assay) and CCNA, and TcdA and TcdB were quantified using the UIA (tested in triplicate). The limits of detection (LoDs) for the TcdA and TcdB assays are 0.04 and 0.62 pg/mL, respectively.

Results. There were 21 PCR+/CCNA+ and 25 PCR−/CCNA− samples. Both toxins were measured above LoD in all PCR+/CCNA+ samples, ranging up to 100,000 pg/mL. The average CV for the PCR+/CCNA+ samples was 9%. The median TcdA concentrations in PCR−/CCNA− and PCR+/CCNA+ samples were 0.19 pg/mL (IQR 0.12–0.67) and 3,301 pg/mL (125–8,737), respectively. The median TcdB concentration in PCR−/CCNA− and PCR+/CCNA+ samples were 0.12 pg/mL (0.12–0.21) and 2,690 pg/mL (145–30,307), respectively. In the PCR+/CCNA+ samples, TcdA was one or more logs higher than TcdB in two samples, one or more logs lower than TcdB in six samples, and within one log of TcdB in 13 samples. In one sample (4.8% of PCR+/CCNA+ samples), TcdA was at moderately high concentration while TcdB was below a provisional cutoff, indicating that only TcdA was expressed. There was a significant correlation between TcdA and TcdB (Spearman r = 0.753).

Conclusion. The UIA allows for toxin quantification over a concentration range of 25 logs, suggesting that the quantitative TcdA and TcdB assays could be of value in CDI characterization and clinical decision making. The TcdA/TcdB ratio varied, and toxin quantification could be a useful tool in further understanding their individual roles in CDI. The TcdA concentration was not lower than TcdB (trended higher), indicating that detection of tcdB or Tdcb alone may not be sufficient for accurate CDI diagnostics.
Table 1: Toxin EIA and PCR Ct Performance

| RefStd (n for QCC) | QCC EIA (n = 253) | IC EIA (n = 218) | Median PCR Ct (Ref+\(+/\)Ref–) |
|-------------------|-----------------|-----------------|-----------------|
| Ref+ only (253)   | 0.36            | 0.34            | 24.3            |
| Ref+ / Cx+ (211)  | 0.41            | 0.39            | 0.94            | 23.7 / 29.1** |
| Ref+ / CCCNA+ (128)| 0.69            | 0.65            | 0.99            | 22.2 / 28.9** |
| Ref+ / cCDI+ (103)| 0.46            | 0.47            | 0.74            | 23.6 / 25.2*  |
| Ref+ / Cx+ / cCDI+ (89)| 0.51    | 0.53            | 0.71            | 23.2 / 26.1*  |
| Ref+ / CCCNA+ / cCDI+ (63)| 0.73| 0.72            | 0.80            | 21.8 / 23.5** |

Ref+ vs. Ref– (Wilcoxon rank-sum): *P < 0.05; **P < 0.0001.

Table 1: Differences in Test Ordering Between Two Periods

|                | Period 1 | Period 2 | Estimated Risk of Ordering (95% CI) | P-value |
|----------------|----------|----------|-------------------------------------|---------|
| GIP Rate       | 7.03     | 5.22     | 0.74 (0.65, 0.84)                   | <0.0001 |
| C-Diff Testing Rate | 2.66 | 2.23 | 0.84 (0.74, 0.94) | 0.0039 |

Conclusion. Diagnostic stewardship of GIP using guidelines and electronic ordering restrictions can lead to meaningful improvements in test appropriateness and reduction in cost and waste, demonstrating the value of ASP interacting with the microbiology laboratory.

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1095. The Value of Hardwiring Diagnostic Stewardship in the Electronic Health Record: Electronic Ordering Restrictions for PCR-Based Rapid Diagnostic Testing of Diarrheal Illnesses

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Background. In 2015, the microbiology laboratory introduced a multiplex PCR test (FilmArray® Gastrointestinal Panel (GIP)), replacing traditional stool culture. The GIP is faster and more sensitive than traditional stool culture, detecting 22 common viral, bacterial, and parasitic pathogens; but is significantly more expensive. The antimicrobial stewardship program (ASP) developed guidelines on test use and interpretation, recommending inpatient use only once per admission and not after hospital day 5. C. difficile test results from the GIP were not reported at any time.

Methods. Inpatient GIP use was reviewed over one year and considered inappropriate if performed >3 days after admission or repeated. Noncompliance with ASP recommendations was common; no meaningful pathogens were detected upon review of all inappropriate GIP use. An inpatient GIP electronic order restriction was implemented in April 2017 eliminating the ability to order tests inappropriately. GIP testing outside the restriction could be approved by the microbiology lab director. We captured separate C. difficile testing rates as a counterbalance measure. We used Poison regression models to compare the rate of GIP and C. difficile tests per month between Period 1 (July 2015–March 2017) and Period 2 (April 2017–March 2018) per 1,000 patient-days (PD).

Results. The restriction resulted in a 26% reduction in GIP ordering rates between the two periods (Table 1, Figure 1). Direct cost savings was approximately $63,000. Table 1 shows changes in C. difficile test ordering rates during Periods 1 and 2. When including GIP tests that were ordered but not completed, potential GIP testing was reduced by 46% for a savings of $131,000 (Figure 2). Only 42 test overrides were approved by the microbiology director since the intervention; of those only two were positive (Cryptosporidium and Norovirus).

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1096. Effect of Diarrheal Illness During Pregnancy on Adverse Birth Outcomes in Nepal

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Background. Adverse birth outcomes, including low birthweight (LBW), small for gestational-age (SGA) and preterm birth, contribute to 60–80% of infant mortality worldwide. Little published data exist on the association between diarrhea during pregnancy and adverse birth outcomes. We sought to identify whether diarrhea during pregnancy was associated with adverse birth outcomes.

Methods. We used data from a community-based, prospective randomized trial of maternal influenza immunization of pregnant women and their infants conducted in rural Nepal from 2011 to 2014. Illness episodes were defined as at least three watery