Use of Whole-Genome Sequencing to Guide a *C. difficile* Diagnostic Stewardship Program

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**BACKGROUND**

- Hospital-onset *C. difficile* infection (HO-CDI) is defined as a case occurring after the third day of hospitalization
- Rates at Medstar Washington Hospital Center were 50% greater than predicted despite multiple interventions
- Published data suggest that 4-15% of patients can be colonized with *C. difficile* at hospital admission
- Using epidemiological and whole-genome sequencing data to define our transmission pattern, a diagnostic stewardship intervention was instituted

**METHODS**

- Baseline data from Jan 2017-May 2017 was used to determine the HO-CDI rate
- Isolates from CDI cases were sequenced for strain relatedness and epidemiologically analyzed using a single nucleotide polymorphism (SNP)-based approach
- In June 2017, a QI project reviewed all orders for CDI for appropriate indications:
  - ≥3 loose stools/24 hours
  - Absence of laxative administration
  - Presence of fever/leukocytosis or a history of inflammatory bowel disease
  - Tests not meeting appropriate indications were recommended for cancellation
- In Nov an EMR-based testing algorithm was introduced

**RESULTS**

- **646 orders for all C. diff tests reviewed**
  - 421 (65%) met criteria
  - 225 (35%) did not meet criteria
  - 64 (15%) were positive
  - 9 (4%) not cancelled were positive

- **HO-CDI rate decreased from 11.67/10k in the 5-month baseline period to 7.13/10k in the 9-month intervention period (p<0.0008)**

**CONCLUSION**

- WGS revealed that nosocomial transmission of *C. difficile* was an unlikely cause for our elevated CO-CDI rate
- A diagnostic stewardship intervention which focused on identifying community-acquired infection and avoiding over-testing was associated with a sustained decrease in the HO-CDI rate which has persisted for 9 months
- Since acceptance of this abstract, our HO-CDI rate has continued to fall, with rates of 4.4 (March), 5.3 (April), 1.3 (May), 4.6 (June), 2.6 (July), and 2.6 (August) for an overall rate of 5.7 since project initiation

**REFERENCES**


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