Impact of a multicomponent intervention bundle on healthcare facility-onset *Clostridium difficile* rates

Ann Keegan, BSN, RN, CIC; Kelli Cole, PharmD, BCPS; Melissa Ahrens, MPH, CIC; Mark Eckhart, MPH, LPTA, CIC; Geehan Suleyman, MD

1Department of Infection Prevention and Control, University of Toledo Medical Center, Toledo, OH
2Department of Pharmacy Services, University of Toledo Medical Center, Toledo, OH
3Department of Infectious Disease, University of Toledo Medical Center, Toledo, OH

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**Background**

- *Clostridium difficile* is the most common cause of healthcare-associated infections in U.S. hospitals.
- The National Healthcare Safety Network (NHSN) surveillance system tracks *C. difficile* infections (CDI), one of the measures used by Centers for Medicare & Medicaid Services (CMS) to determine a hospital’s total Hospital-Acquired Conditions (HAC) score and ranking among other hospitals.
- Used to calculate Value-Based Purchasing (VBP) pay-for-performance incentive payments, which may lead to significant reductions in a facility’s reimbursement if rates are too high.
- The objective of this study was to assess the effectiveness of a multicomponent intervention bundle in reducing healthcare facility-onset (HD) CDI rates in a 319-bed teaching hospital in northwest Ohio.

**Methods**

**Study design:**
- Pre-post quasi-experimental retrospective study
- Pre-intervention CDI rate per 1,000 patient days and Standardized Infection Ratio (SIR) from Jan 1, 2017 to September 30, 2017
- Post-intervention CDI rate per 1,000 patient days and SIR from January 1, 2018 to June 30, 2018

**Intervention:**
- In October 2017, a multidisciplinary team was assembled to:
  - Implement a testing algorithm to guide physicians and nurses (Figure 1)
    - Focus on increasing early detection and decreasing inappropriate testing
    - Order set mirroring the algorithm was created
    - Hard stop automatically canceled orders if patient had received promotility agents within 48 hrs
    - Enforce re-testing criteria with hard stops
      - No re-testing within 7 days and in those who were positive during the admission
    - Establish treatment guidelines
  - Infection Preventionists (IPs) provided staff education
  - Each *C. difficile* order was monitored to ensure appropriate testing
    - IPs contacted the nurses during the week
    - Contact isolation, hand hygiene, enhanced environmental cleaning and disinfection were reinforced
  - Antimicrobial stewardship pharmacist reviewed all cases to:
    - Discourage unnecessary medications, encourage judicious use of antimicrobials, and ensure appropriate treatment

**Testing was performed using Quidel Solana C. difficile PCR assay**

**Statistics**

- *C. difficile* testing incidence density rate (IDR)=number of tests completed per month in the facility/ number of patient days) x 1,000
- An IDR p<0.05 was considered statistically significant
- SIR (# of observed infections/# of expected infections) data were obtained from NHSN repository
- Pre- and post-intervention CDI rates and SIR were compared via χ² test

**Results**

**Table 1**: C. difficile overall testing, rate and SIR during the pre- and post-intervention period

<table>
<thead>
<tr>
<th></th>
<th>Pre-intervention</th>
<th>Post-intervention</th>
<th>Reduction</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDI testing per 1000 patient days</td>
<td>1410 (67.1%)</td>
<td>419.383.3730</td>
<td>99.45%</td>
<td>0.000 (IDR)</td>
</tr>
<tr>
<td>CDI rate per 1000 patient days</td>
<td>0.028</td>
<td>0.012</td>
<td>63%</td>
<td>0.006</td>
</tr>
<tr>
<td>SIR</td>
<td>0.418</td>
<td>0.418</td>
<td>65%</td>
<td>0.006</td>
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</tbody>
</table>

**Conclusion**

- Implementing a *C. difficile* multicomponent intervention bundle that emphasizes early and appropriate testing reduces inappropriate testing, HD-CDI rates and SIR

**Disclosures**

The authors have nothing to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter.