The Kansas Two-Step: Simplifying the diagnosis of clostridioides difficile at an academic medical center

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Clostridioides difficile (C. diff) is a highly infectious cause of diarrhea that can lead to life threatening dehydration. Elderly patients, those in hospital and those who have recently been discharged are at higher risk for C. diff infection, with many C. diff infections occurring after antibiotic use. Consequently, interventions focused on infection control and antibiotic stewardship can help reduce C. diff. In the United States, the National Health and Safety Network (NHSN) tracks healthcare-associated infections, which directly link to reimbursements associated with the Centers for Medicaid & Medicare Services (CMS).

At the University of Kansas Health System, the Infection Control team reported an inpatient C. diff rate of 19% to the National Health and Safety Network (NHSN), which directly contributed to decreased reimbursement through the Centers for Medicaid & Medicare Services (CMS). One explanation for this reportable rate was the lack of a reliable and efficient testing algorithm to differentiate active toxigenic infections from non-toxigenic scenarios such as colonization, thus causing an erroneously elevated rate of C. Diff. The inability to differentiate between infection types has significant downstream impact on patient care, including requirements for patients to be held under contact and enteric precautions needlessly, unwarranted antibiotic use, and overutilization of the Infectious Disease consult team.

In recent years, the Society for Healthcare Epidemiology of America (SHEA) and the Infectious Diseases Society of America (IDSA) have recommended a two-step testing process for C. diff detection to help differentiate between active toxigenic infections and non-toxigenic scenarios. As such, this initiative aimed to introduce a new 2-step methodology and associated protocol change to reduce the NHSN C. diff rates by 50% and reduce associated costs.

The team at the University of Kansas Health System created a testing algorithm utilizing polymerase chain reaction (PCR) and enzyme immunoassay (EIA) to ensure all C. Diff positive stool samples, as detected by PCR test, are reflexed to a toxin EIA. All C. Diff PCR positive/EIA negative specimens were algorithmically defined as colonization, whereas C. diff PCR positive/EIA positive specimens were classified as active C. diff infection. This new algorithm, combined with multidisciplinary education has resulted in an absolute reduction of the NHSN reportable rate by 76% (from 19% to 3.8%), while also reducing inappropriate antibiotic use by 25%, with an average health system cost savings of 4.3 million.

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