

## Original Article

# Evaluating outpatient diagnostic stewardship of comprehensive polymerase chain reaction *Clostridioides difficile* testing in a regional health system

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### Abstract

**Objective:** We examined the use of comprehensive and targeted polymerase chain reaction (PCR) of *Clostridioides difficile* infection (CDI) among immunocompetent patients with and without CDI risk factors across different outpatient settings. A priori, we expected patients with higher CDI risk to be associated with targeted testing to reflect providers incorporating pretest risk factors in their choice of test assay.

**Design:** Retrospective analysis of adult patients from clinic, emergency room, and non-medically acute inpatient settings.

**Setting:** A tertiary academic medical center offering inpatient and outpatient medical, surgical, mental health, and rehabilitation services to Veterans across the Puget Sound region.

**Patients:** Immunocompetent adult patients with ≥1 stool PCR assay performed between January 2016 and December 2019.

**Intervention:** Patients were tested with either a specific *tcdB* PCR assay or a comprehensive gastrointestinal PCR panel that tests for 22 pathogens.

**Results:** A total of 2,717 tests (74% targeted, 26% comprehensive) were obtained from 2,156 patients, among which 13% detected *C. difficile* and 7% detected other organisms. The proportion of comprehensive PCR tests increased nearly four-fold from 2016 to 2019 in clinic and emergency room settings, independent of CDI risk factors. Only two CDI risk factors (prior history of CDI and antibiotic use within three months before testing) were associated with increased targeted testing.

**Conclusion:** The use of comprehensive GI PCR among immunocompetent adults with diarrhea is increasing in the outpatient setting. There may be an opportunity for diagnostic stewardship by nudging providers to consider all CDI risk factors at the time of test selection.

**Keywords:** diagnostic stewardship; *Clostridioides difficile* testing; comprehensive stool PCR; PCR; molecular management

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## Introduction

Introduction of syndromic comprehensive polymerase chain reaction (PCR) panels without guidance may contribute to low-value care. To date, most diagnostic stewardship research has focused on the use of these panels for respiratory tract infections.<sup>1–3</sup> *Clostridioides difficile* infection (CDI) is a frequent cause of infectious diarrhea among Veterans.<sup>4</sup> Comprehensive gastrointestinal (GI) PCR testing has been associated with decreased imaging, endoscopy, and antibiotic use,<sup>5–7</sup> but the optimal use of this assay remains unclear in the outpatient setting.<sup>8</sup> Patients may be tested for CDI with specific or comprehensive assays, but there

is no guidance for which test to use and how to consider the pretest probability of alternate enteropathogens. To inform future interventions aimed at optimizing the use of these assays, we described their use among immunocompetent patients with and without CDI risk factors across different outpatient and non-medically acute inpatient settings. Additionally, we evaluated whether immunocompetent patients with CDI risk factors who tested positive for other organisms by comprehensive assay had increased healthcare utilization.

## Methods

### Population and setting

We conducted a retrospective analysis of adult patients from clinic, emergency room, and non-medically acute inpatient settings (psychiatry, residential, and rehabilitation units) with ≥1 stool

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# Outpatient Diagnostic Testing Manual

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