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Response to Prior and Fitzpatrick

To the Editor—Many laboratories in the United States use nucleic acid amplification tests (NAATs) for the diagnosis of *Clostridium difficile* infection (CDI). Although NAATs have excellent sensitivity, there is increasing concern that asymptomatic carriers of toxigenic *C. difficile* with unformed stool due to other causes (eg, laxatives) are often diagnosed with CDI, resulting in unnecessary treatment and inflation of CDI rates.[1–5] One strategy to address this concern has been to restrict testing to patients with 3 or more unformed stools within 24 hours.[5] Alternatively, a common approach in Europe is not to restrict testing but to use a 2- or 3-step testing algorithm in which results of stool toxin testing and clinical assessments are used to guide management for patients with positive initial screening assays for *C. difficile*. In this approach, a positive toxin assay indicates CDI and a negative toxin assay suggests an asymptomatic carrier who may contribute to transmission as a fecal excretor.[6] Fecal excretors are isolated but are not routinely treated or reported as CDI cases.

As noted by Prior and Fitzpatrick,[7] the European CDI testing approach has some advantages. Testing after a single unformed stool facilitates rapid diagnosis, and fecal excretors are isolated but not exposed to unnecessary CDI treatment. We share the concern of Prior and Fitzpatrick regarding the potential for transmission by fecal excretors. We demonstrated that antibiotic-exposed patients not meeting criteria for CDI (ie, <3 unformed stools within 24 hours) were as likely to have skin and/or environmental contamination as CDI patients meeting criteria for testing.[1] Similarly, Biswas et al[8] demonstrated that fecal excretors frequently shed spores.

It is possible that the European approach to CDI testing may begin to replace stand-alone NAAT testing in the United States, as has been advocated by Polage et al.[3] However, some caveats to this approach deserve further study. First, our findings suggest that a subset of fecal excretors may present a relatively low risk for transmission. Specifically, none of 17 patients with an alternative explanation for diarrhea (eg, laxatives) and no antibiotic exposure in the past 90 days had skin and/or environmental shedding (see Figure 1 of Kundrapu et al[1]). In the absence of antibiotic exposure, the microbiota of these carriers may be sufficiently intact to maintain *C. difficile* colonization at low levels that are less likely to be associated with shedding. Based on these results, we recommended that facilities using NAATs for CDI testing could reduce testing in this subset of patients because isolation of those with positive CDI tests might provide limited infection prevention benefits while subjecting patients to isolation. Because our study was relatively small and included only 1 center, additional studies are needed to confirm our findings. Second, although Prior and Fitzpatrick suggest that toxin testing adds certainty to decision making, further studies are needed to clarify whether the presence or absence of toxin truly provides certainty in distinguishing colonization from infection. In previous studies, asymptomatic carriers, including those who have recently completed successful CDI treatment, often have had detectable toxin in stool.[2,9,10] Thus, unnecessary treatment may be prescribed for carriers if a positive toxin assay is deemed sufficient evidence to diagnose CDI in the absence of clinically significant diarrhea.

Third, the recommendation that the clinical presentation should be assessed after lab results are available is reasonable but will require education. In practice, clinicians often reflexively treat positive tests. For example, Buckel et al[4] found that 100% of asymptomatic patients testing positive for toxin genes by NAAT were treated for CDI despite a stewardship intervention that included education plus

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monitoring and feedback. Fourth, because glutamate dehydrogenase (GDH) testing does not distinguish toxigenic and nontoxigenic strains, use of this assay as the initial screening test in a 2-step algorithm may result in identification of fecal excretors of nontoxigenic *C. difficile* who would be isolated (ie, GDH positive, toxin negative). Nontoxigenic *C. difficile* strains do not cause disease and isolation is not required. A third step NAAT test would be required to confirm carriage of a toxigenic strain. Finally, if detection and isolation of fecal excretors are considered important goals of 2- or 3-step testing algorithms, it should be acknowledged that this is an imperfect detection method. Asymptomatic carriers with no diarrhea, including patients who have recently completed CDI treatment, may shed spores to their skin and the environment.[11]

In summary, we found that no patients with an alternative explanation for diarrhea and no recent antibiotic exposure had skin and/or environmental shedding of spores.[1] Based on this finding, we believe that it is reasonable to limit testing of such patients, particularly in facilities using stand-alone NAATs for CDI testing. However, our finding that antibiotic-exposed patients with <3 unformed stools within 24 hours who tested positive by NAAT frequently had skin and/or environmental contamination validates some of the concerns raised regarding restricting testing for all patients with unformed stool but not meeting criteria for clinically significant diarrhea. Testing of such patients using a 2- or 3-step algorithm may be helpful to identify fecal excretors who can be isolated to prevent transmission. Finally, because all CDI testing methods have limitations, it is essential that clinicians and infection control practitioners understand the advantages and disadvantages of the laboratory method used in their facility and appreciate the need to correlate test results with clinical assessments.

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Challenges of Long-Term MRSA Management in a Complex Continuing Care Setting

To the Editor—Methicillin-resistant *Staphylococcus aureus* (MRSA) is a common nosocomial infectious agent with greater associated mortality and morbidity than infections caused by methicillin-susceptible *Staphylococcus aureus* isolates.[1] One considerable reservoir of MRSA is patients in long-term care facilities, who often have >1 factor predisposing them to become persistent MRSA carriers: advanced age, prior hospitalizations with greater length of stay, the presence of wounds, indwelling devices, and chronic diseases.[2] These patients have also been shown to have low rates of successful