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***Clostridium difficile* Colonization of Nursing Home Residents**

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To the Editor

Clostridium difficile is a leading cause of infectious diarrhea in nursing homes.¹ There is a need for evidence based infection control guidelines to reduce transmission of *C. difficile* in nursing homes. These guidelines should account for the prevalence of *C. difficile* in the nursing home environment. The primary objective of this project was to assess the proportion of nursing home residents who are colonized with toxigenic *C. difficile*.

A random sample of community-based nursing home residents (10%, n=40) and VA Community Living Centers (CLC) residents (20%, n=40) were selected retrospectively from two cohort studies on MRSA colonization and transmission.^{2,3} The studies enrolled 401 residents from 13 community based nursing homes in Maryland and Michigan and 200 residents from five VA CLCs in four states and the District of Columbia. Selection within the community-based facilities was designed to be representative of all nursing home residents, whereas among the VA CLCs, two groups of residents were enrolled: residents with a recent (within 1 year) history of MRSA colonization and residents without recent MRSA colonization. All VA CLC residents with recent MRSA colonization were approached for enrollment. A random sample of residents without recent MRSA colonization was approached for enrollment to provide a representative sample. Specimens from the perianal skin were taken from enrolled residents. Of note, diarrhea was reported for 2-3 % of the study cohorts. No *C. difficile* outbreaks were reported during the studies.

Culture based methods were used to detect toxigenic *C. difficile* in perianal swabs. Resident swabs from the perianal skin were placed in Cycloserine Cefoxitin Mannitol Broth with Taurocholate and Lysozyme broth (Anaerobe Systems; Morgan Hill, CA) at 35°C in anaerobic conditions observing for growth at 24 hrs, 48 hrs, and 7 days. If growth was

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observed it was transferred to a blood agar plate and incubated in aerobic conditions at 35°C for 48 hrs. Any bacteria growth was identified using RapID Ana II system (Remel:Lenexa, KS). Toxin A and B and *C. difficile* glutamate dehydrogenase detection was determined by C Diff QUIK CHEK COMPLETE kit (TechLab; Blacksburg, VA).⁴

Among the community based nursing homes residents, one of 40 residents had perianal skin swabs tested positive for toxigenic *C. difficile* (2.5%, 95%CI 0.1%-13.2%). None of the 40 VA CLC residents tested positive for toxigenic *C. difficile* (0%, 95%CI 0.0%-8.8%).

These results are slightly lower than what has been reported in the literature. Based on data from 9 eligible studies that included 1,371 subjects, a recent systematic review found that 14.8% (95%CI 7.6%-24.0%) of LTCF residents are asymptomatic carriers of toxigenic *C. difficile*.⁵ The systematic review included 21 LTCFs across four countries and four states. In contrast, our populations cover 18 nursing homes in six states. The facilities in the review with the highest reported rates of *C. difficile* colonization had also experienced recent outbreaks of *C. difficile* infection which increased their estimate. Our results should reassure nursing homes that prevalence of toxigenic *C. difficile* is low during endemic periods. Standard precautions should be sufficient to prevent transmission under non-epidemic conditions.

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References

1. Jump RLP, Donskey CJ. Clostridium difficile in the Long-Term Care Facility: Prevention and Management. *Curr Geriatr Rep.* 2015; 4:60–69. [PubMed: 25685657]
2. Roghamm MC, Johnson JK, Sorkin JD, et al. Transmission of Methicillin-Resistant Staphylococcus aureus (MRSA) to Healthcare Worker Gowns and Gloves During Care of Nursing Home Residents. *Infect Control Hosp Epidemiol.* 2015; 36:1050–1057. [PubMed: 26008727]
3. Pineles L, Morgan DJ, Lydecker A, et al. Transmission of methicillin-resistant Staphylococcus aureus to health care worker gowns and gloves during care of residents in Veterans Affairs nursing homes. *Am J Infect Control.* 2017
4. Hink T, Burnham CD, Dubberke ER. A systematic evaluation of methods to optimize culture-based recovery of Clostridium difficile from stool specimens. *Anaerobe.* 2013; 19:39–43. [PubMed: 23247066]
5. Ziakas PD, Zacharioudakis IM, Zervou FN, Grigoras C, Pliakos EE, Mylonakis E. Asymptomatic carriers of toxigenic *C. difficile* in long-term care facilities: a meta-analysis of prevalence and risk factors. *PLoS One.* 2015; 10:e0117195. [PubMed: 25707002]