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Clostridioides Difficile Testing of bedside and shower curtains in C diff-positive patient population rooms

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Introduction

- *Clostridioides difficile* (*C diff*) causes nearly half a million infections among patients in the US in a single year.
- The estimated annual cost related to *C diff* infections is $4.8 billion for acute care facilities.
- The average length of stay for *C diff* patients is 9.7 days.
- Previous studies have demonstrated acquisition of bacterial pathogens on healthcare workers' hands from contaminated privacy curtains in patient rooms resulting in increased risk of transmission to subsequent patients.
- Acute care hospital policies vary on procedures for exchanging curtains in Contact / Enhanced Contact Precautions rooms.
- Parkview Health policy states curtains should be cleaned or exchanged on an annual basis and when obvious, gross soiling has taken place, as requested by Infection Prevention or nursing staff.
- At the time of this study, Parkview Health used molecular testing for *C diff* detection in patients with diarrhea.

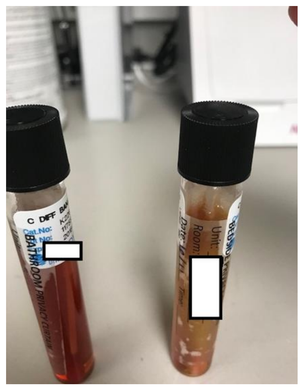
Research Question

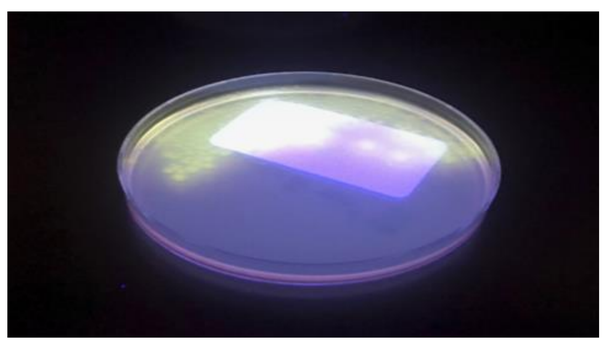
Are curtains in a *C diff*-positive patient room a potential source of contamination and risk factor of *C diff* infection for subsequent patients?

Methods

Random testing of bedside and bathroom/shower curtains (n = 52) in *C diff*-positive patient rooms occurred during patient stay and immediately after discharge.

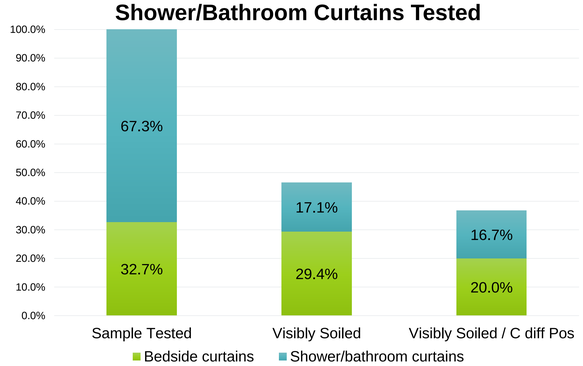
- A 50 cm^2 surface area was swabbed with a pre-moistened sterile flocked swab, reversing directions between strokes. For bedside privacy curtains, an area approximately 1 m. from floor was swabbed, and for shower/bathroom curtains, an area closest to toilet, between 0.5-1 m. from floor was swabbed.
- After each swab, the tip of the swab was inserted into labeled test tubes containing broth medium. Immediately after inoculation, the cap was tightly fastened to ensure anaerobic growth of *C diff*.
- The broth media was incubated at 35-37°C for 48-72 hours in the microbiology laboratory. After incubation, a positive result was indicated by a change in broth color from red to yellow.
- Confirmatory testing was required for all positive broths using selective agar media specific to *C diff* growth at room temperature in an anaerobic chamber. Following 18-48 hours of incubation, long-wave ultraviolet light testing was performed to identify growth of *C diff* colonies.

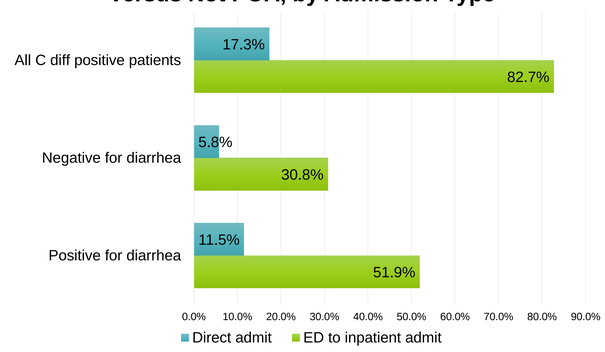




Results

- All curtains positive for *C diff* contamination were from rooms of patients with severe *C diff* infection (CDI).
- Of bedside curtains tested (17/52), 29.4% were visibly soiled (VS), with 20.0% of the VS curtains confirmed positive for *C diff*.
- Of shower curtains tested (35/52), 17.1% were VS.
  - Of VS shower curtains, 16.7% were confirmed positive.
  - Of non-VS shower curtains, 3.5% were confirmed positive.
- The relative risk ratio (RRR) for VS curtains was 6.21 (95% CI 1.75-22.1) suggestive of greater risk for *C diff* contamination on VS curtains compared to non-VS curtains. RRR for non-VS curtain contamination was 1.69 (95% CI 0.98-2.93).
- A 2x2 contingency Fisher's Exact Test (two-tailed) was used to determine high probability for curtains to have *C diff* contamination if they are VS versus non-VS (p = 0.0071).
- Of *C diff* positive patients, the majority presented to the ED prior to being admitted to an inpatient room (82.7%).
  - 51.9% reported diarrhea prior to ED admission.
  - 30.8% were negative for diarrhea prior to ED admission.





Discussion

- In light of previous studies conducted on curtain contamination and this prospective case study, the evidence suggests a potential for curtains to be a reservoir for *C diff* contamination and a source of infection transmission, particularly curtains that are visibly soiled.
- Of significant interest is the finding of *C diff* contamination on curtains in rooms where patients suffered from severe CDI.

Implications for Practice

- It may be beneficial for both patient safety and hospital savings to revisit current policy regarding curtain exchanges in the patient rooms, specifically patients in Enhanced Contact Precautions.
- Due to the high volume of ED to Inpatient Admission in our sample, this unit is considered high-risk for *C diff* contaminated curtains possibly necessitating exchanging curtains after each confirmed or suspect *C diff* visit.