



COMITÉ SUR LES INFECTIONS NOSOCOMIALES DU QUÉBEC

Divider curtains and infection risk

INSTITUT NATIONAL
DE SANTÉ PUBLIQUE
DU QUÉBEC

AUTHOR**Comité sur les infections nosocomiales du Québec****WRITER****Dr. Yves Longtin**

Institut universitaire de cardiologie et pneumologie de Québec

We would like to thank the Community and Hospital Infection Control Association for their contribution in the official translation of the document.

This document is available in its entirety in electronic format (PDF) on the Institut national de santé publique du Québec Web site at: <http://www.inspq.qc.ca>.

Reproductions for private study or research purposes are authorized by virtue of Article 29 of the Copyright Act. Any other use must be authorized by the Government of Québec, which holds the exclusive intellectual property rights for this document. Authorization may be obtained by submitting a request to the central clearing house of the Service de la gestion des droits d'auteur of Les Publications du Québec, using the online form at <http://www.droitauteur.gouv.qc.ca/en/autorisation.php> or by sending an e-mail to droit.auteur@cspq.gouv.qc.ca.

Information contained in the document may be cited provided that the source is mentioned.

LEGAL DEPOSIT – 4th QUARTER 2013
BIBLIOTHÈQUE ET ARCHIVES NATIONALES DU QUÉBEC
LIBRARY AND ARCHIVES CANADA

© Gouvernement du Québec (2013)

Introduction

Divider curtains are often used in health care settings to surround patient's bed and provide privacy. Many factors contribute to the concern that these curtains are a potential source for the transmission of pathogenic microorganisms: 1) caregivers and patients touch curtains frequently; 2) in some settings, curtains are not often cleaned or changed; 3) health care workers and patients who handle curtains do not necessarily cleanse their hands before (or after) touching them.

In May 2011, the Comité sur les infections nosocomiales du Québec (CINO) was asked to provide its opinion on the frequency of cleaning and the precautions to be taken to ensure the safe handling of divider curtains. The purpose of this document is to review the evidence on the role of divider curtains in the transmission of pathogens in health care settings and to provide recommendations for the cleaning and handling of divider curtains.

Theoretical considerations

The following conditions must be met for divider curtains to become a transmission vector:

1. The curtain must be contaminated by the hands of a caregiver or patient, or by the projection of infected matter;
2. Thereafter, microorganisms must survive on the curtain for more than a few minutes;
3. The microorganisms must then be transferred onto the hands of another person;
4. The person who acquires the microorganisms must then perform sub-optimal hand hygiene or omit it entirely;
5. Transient microorganisms on hands must then be transmitted to another patient or an object.

Therefore, multiple external factors determine the risk of transmission from divider curtains. Unfortunately, very little scientific evidence allows us to quantify the risk.

The level of contamination on curtains is closely related to the infectious status of the patients who have spent time in proximity to the curtains. For example, it would be very surprising to find vancomycin-resistant *Enterococcus* (VRE) on a divider curtain if no patients carrying VRE have spent time in the unit since the curtains were installed. Inversely, a curtain is at higher

risk of contamination by VRE if patients carrying this organism have spent time in proximity to the curtain.

Evidence review

Very few studies have examined the potential role of divider curtains in the transmission of pathogens. Moreover, the published studies are all transversal studies and they have methodological limitations.

One transversal study evaluated contamination by methicillin-resistant *S. aureus* (MRSA) in 200 divider curtains over a one-week period using selective contact plates.[1] In this study published in the form of a letter to the editor, MRSA was recovered from 31 of the 200 curtains examined (15.5%). However, the levels of contamination were low (median, 1 colony-forming unit [CFU]; maximum, 113 CFU). Moreover, the study did not determine the frequency of curtain changes, the level of adherence to hand hygiene practices, the use of gloves and the rate of endemicity for MRSA in the institution.

Another study in the United States tested 50 divider curtains specifically for the presence of MRSA, VRE and *C. difficile*, using contact plates and swabbing.[2] In this institution, curtains were washed once every four months. Researchers also evaluated the transmissibility of these germs onto the hands of caregivers who touched the curtain while wearing sterile gloves. MRSA, VRE and *C. difficile* were recovered from surface plating on agar in 22% (11/50), 20% (10/50) and 0% of all curtains, respectively. However, the number of CFU was very small (between 1 and 11 CFU per curtain). *C. difficile* was recovered using a swabbing technique and an enrichment culture broth in 4% (2/50) of the curtains. The curtains most often contaminated were those used in isolation rooms. After handling curtains, hands were contaminated $\leq 50\%$ of the time, but levels were very low (1-2 CFU).

Contamination of curtains may be more significant during outbreaks. For example, a study has shown a high level of contamination in curtains during an outbreak of carbapenemase-producing *A. baumannii* in the United Kingdom.[3]

It should be noted that it is very difficult to extrapolate the results of these studies in order to apply them to Québec's realities, because the prevalence of carriers of multi-resistant bacteria in Québec is usually much lower than the rates observed in the United States.

The survival of pathogens on divider curtains is poorly understood and not well documented. However, it is believed that MRSA can survive up to nine days on curtains in certain conditions.[4] A team of researchers studied the possibility of targeted disinfection on the high touch zones of divider curtains without having to take the curtains down.[5] The technique they developed involved spraying hydrogen peroxide (3 %) on the edge of the curtain (the area most often touched) until saturation was achieved. After a contact time of two hours, no bacteria were detected on the surface of the curtain in the spray-treated zone (compared to 22 CFU/24cm² before disinfection). For the time being, this practice cannot be recommended on the basis of this one study. In fact, the chemical composition of the hydrogen peroxide used in this study differs from the stabilized hydrogen peroxide used in Québec health care settings for environmental cleaning, and the state of knowledge in this area is insufficient to allow us to recommend potential product substitutions. Furthermore, the inherent security concerns regarding airborne suspensions of hydrogen peroxide produced by spraying have not been documented.

Learned societies' recommendations

The Centers for Disease Control and Prevention (CDC) classify curtains as "high touch" surfaces.[6] They recommend that high touch surfaces be washed and disinfected more often than "low touch" surfaces, and also when they are visibly soiled (ranked Category II according to scientific evidence).[7] The CDC also recommends that the frequency and the practices for curtain maintenance be determined jointly with the maintenance personnel. *Le Guide d'hygiène et salubrité en milieu de soins – démarche pour le développement de stratégies d'entretien des surfaces* [Guide for hygiene and healthiness in healthcare settings – a framework for the development of strategies for cleaning surfaces], published by Québec's Ministère de la Santé et des Services sociaux, proposes a similar approach based on infection risk rankings.[8] These guidelines do not specifically address divider curtains. However, other guidelines published by Groupe hygiène et salubrité regarding nosocomial infection control have classified divider curtains as high touch or low touch surfaces

according to several factors: proximity of a patient carrying a significant pathogen for nosocomial infections, frequency of use, traffic and activities in the surrounding area.[9] Lastly, the World Health Organization (WHO) states that the frequency of disinfection or washing of curtains should be determined locally.[10] The WHO's guidelines on hand hygiene do not specify whether hand hygiene should occur before or after handling curtains (i.e. they do not specify if the curtains are part of the patient zone).[11]

CINQ's Recommendations

Considering that:

- Very few published studies address the role played by divider curtains in the risk of transmission of pathogens;
- Divider curtains can be considered as "high touch" or "low touch" surfaces according to intensity of use, traffic and activities in the surrounding sector.

CINQ recommends the following:

- Wash or change curtains after patient discharge when the patient is a carrier of a microorganism requiring contact precautions;
- In the absence of contact precautions, the frequency of curtain washing should take into account the problems related to handling, local capacity, frequency of handling, health care sector, and the curtain's "high touch" or "low touch" status. As a minimum, curtains should be washed once a month, and when they are visibly soiled.[9] A schedule should be established for curtain changes in each sector of the institution.
- Establish a rotation schedule for curtain washing sector by sector;
- Ensure hand hygiene:
 - When the caregiver enters the patient zone: **after** having touched the divider curtain and **before** touching the patient or the patient's immediate environment;
 - Upon leaving the patient zone: **after** having touched the divider curtain.

References

1. Klakus, J., N.L. Vaughan, and T.C. Boswell, *Methicillin-resistant Staphylococcus aureus contamination of hospital curtains*. J Hosp Infect, 2008. 68(2): p. 189-90.
2. Trillis, F., 3rd, Eckstein, E.C., Budavick, R., Pultz, M.J., Donskey, C.J. Contamination of hospital curtains with healthcare-associated pathogens. Infect Control Hosp Epidemiol, 2008. 29(11): p. 1074-6.
3. Das, I., et al., Carbapenem-resistant Acinetobacter and role of curtains in an outbreak in intensive care units. J Hosp Infect, 2002. 50(2): p. 110-4.
4. Huang, R., Mehta, S., Weed, D., Savor, C. Methicillin-resistant *Staphylococcus aureus* survival on hospital fomites. Infect Control Hosp Epidemiol, 2006. 27(11): p. 1267-9.
5. Neely, A.N. and M.P. Maley, The 1999 Lindberg award. 3% hydrogen peroxide for the gram-positive disinfection of fabrics. J Burn Care Rehabil, 1999. 20(6): p. 471-7.
6. Sehulster, L. and R.Y. Chinn, Guidelines for environmental infection control in health-care facilities. Recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC). MMWR Recomm Rep, 2003. 52(RR-10): p. 1-42.
7. Rutala, W.A., D.J. Weber, and HICPAC, CDC Guideline for Disinfection and Sterilization in Healthcare Facilities, 2008. 2008.
8. Québec, G.d., Hygiène et salubrité en milieu de soins - Démarche pour le développement de stratégies d'entretien des surfaces, L.D.d.c.d.m.d.I.S.e.d.S.s.d. Québec, Editor. 2009.
9. Groupe Hygiène et salubrité au regard de la lutte aux infections nosocomiales. Lignes directrices en hygiène et salubrité – Analyse et concertation. MSSS, Mai 2006.
10. World Health Organization, Prevention of hospital acquired infections. 2002, World Health Organization: Geneva.
11. WHO Guidelines on Hand Hygiene in Health Care. 2009, World Health Organization: Geneva.



EXPERTISE
CONSEIL



INFORMATION



FORMATION

www.inspq.qc.ca



RECHERCHE
ÉVALUATION
ET INNOVATION



COLLABORATION
INTERNATIONALE



LABORATOIRES
ET DÉPISTAGE

Institut national
de santé publique

Québec

