

Body Fluid Waste Management at Lévis Hospital (Quebec, Canada)

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Hôtel-Dieu de Lévis is a 349-bed acute-care university teaching hospital located in Quebec, Canada. Since 2003, it has participated in a provincial surveillance program monitoring nosocomial infections initiated by the Institut national de santé publique du Québec (INSPQ) [1-3]. Beginning in 2008, Hôtel-Dieu de Lévis observed an increased incidence in *Clostridium difficile* infections, higher than the Quebec provincial average (Figure 1). Another critical period for the hospital occurred in 2012-2013, during which 104 documented cases of *Clostridium difficile* infection were diagnosed, at a rate of 13.1 for 10,000 patient-days. The provincial rate was 7.3. This article presents the organization's experience in the management of these infections.

Adoption of the first preventive measures to reduce the incidence

Several infection prevention measures were adopted in 2009 to correct the situation:

- Daily baths with 2% chlorhexidine for the affected patients.
- Extension of the patient isolation period (10 days after the evacuation of solid stool, compared to three days prior to 2009).
- Training personnel in the importance of hand-washing with soap and water after removing gloves when providing intensive treatment for patients with *C. difficile*.
- Hygienic covers for reusable bedpans, solely in units where exposure is high.
- Transfer of soiled bedpans to sterilization areas to ensure the complete destruction of spores.

Although these corrective methods were taken, the incidence of *C. difficile* infection continued to rise. The infection prevention team suspected that the management of organic waste remained the principle cause of contamination and that the use of multiple methods of treatment (varying if the patient had *C. difficile* or if the exposure was considered "elevated") was a source of confusion for hospital personnel and thereby potentially increased the risk of environmental contamination. These

concerns lead to the introduction of a single, streamlined process, applicable to all cases, whose implementation would be simple and uniform.

Adoption of a new method for management of body fluid

Given the increase in contamination rates, the Hôtel-Dieu de Lévis chose to adopt a new overall simple method for the management of human body fluid (urine, feces, vomit), through the systematic use of hygienic covers and plastic supports manufactured by Hygie Canada. Hygie's products consist of perforated supports which enforce staff compliance to use with a hygienic cover. Each support is 'single-patient use' for the entire duration of their hospitalization. After each use, a new hygienic cover is used to cover the perforated support and collect fecal matter and urine. The biological liquids are absorbed by an absorbent pad that turns liquid waste to gel in a few seconds¹, thereby preventing splashes, spills and cross-contamination of pathogens, while containing odors. Following use, staff are encouraged to tie the cover and discard it in the garbage bin. They then place a new hygienic cover on the support and store it in the night table or under the gurney. The same process is used for urinals and vomit supports. From the outset, the supports are discarded with domestic waste. Additional technology which supports this system also allows for the elimination of old commode chairs, while replacing them with non-porous chairs and seats adapted to the new technology.

Achievement of objectives: Marked reduction in incidence

The change to incorporate the Hygie body fluid waste control system was implemented in all of the organization's care units and Emergency Department in Fall 2012 by a project

1- The hygienic covers contain an absorbent pad capable of gelling up to 700 ml of liquid waste in less than 30 seconds.

management team comprised of representatives of all the parties and care units concerned. In total, 64% of personnel (370/577 nurses and patient attendants) underwent training to ensure the adequate treatment of biological waste. A remarkable 50% decrease in the incidence of nosocomial infections associated with *C. difficile* was observed after the adoption of this technique. The overall rate dropped from 13.1 in 2012-2013 (104 cases) to 6.4 in 2014-2015 (48 cases) [3]. The savings from this reduction were not measured, but are considered to be tangible, given the estimated costs associated with *C. difficile* (management and increased duration of stay.)

Discussion

In infection prevention and control, preventing transmission of infection to *C. difficile* to patients remains a major challenge. Four methods for excreta management are currently used in healthcare establishments: The traditional manual method, bedpan washers, macerators, and hygienic bedpan covers. This last method is a recent concept that allows the safe elimination of human waste [4] and was considered to be the preferred solution for body fluid waste management as well as in the context of *C. difficile* outbreak according to the Quebec healthcare-associated infections committee (INSPQ, 2014) [5].

The use of Hygie technology for the management of biological waste management at Hôtel-Dieu de Lévis appears to have contributed to the marked reduction in the number of cases of *C. difficile* infection (CDI). However, our evaluation

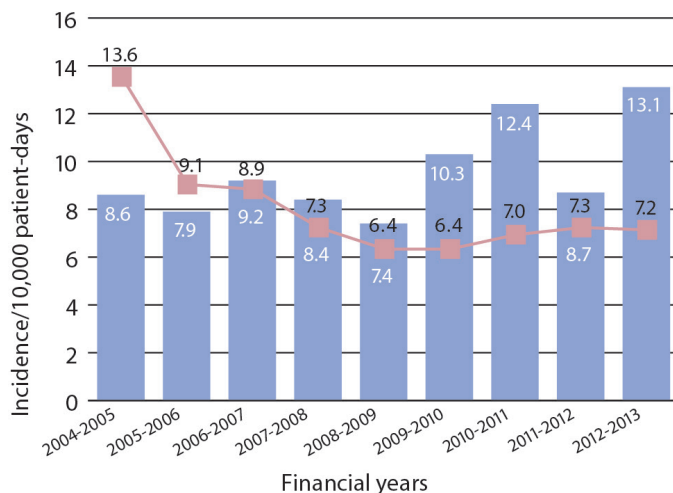
had certain limitations: It was a simple before-and-after the intervention type of comparison (use of covers with supports): Confounding factors which may lower the observed results were not accounted for, such as: Compliance with hygienic hand-washing using soap, the quality of biocleaning, the organization's consumption of antibiotics.

While awaiting a more complete evaluation, the results appeared to be encouraging for the hospital, which decided to continue to use Hygie products in its unit and would encourage similar establishments to do the same. Naturally, the Hôtel-Dieu de Lévis will pursue its efforts to reduce the environmental repercussions and conserve natural resources, through various means: Reduction in waste and polluting emissions, reuse and recycling of materials and responsible management of water and energy consumption. The hygienic covers used are made of a recycled material and the supports are entirely recyclable.

References

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- 4- Agence d'évaluation des technologies et des modes d'intervention en santé (AETMIS). Analyse comparative des équipements de traitement des bassines de lit. *ETMIS* 2009; 4.
- 5- Institut national de santé publique du Québec (INSPQ). Guide de réponse à une écloserie de diarrhée associée au *Clostridium difficile* (DACD) en milieu hospitalier. INSPQ 2014, 15 p.

Figure 1 - Incidence of diarrhea associated with *Clostridium difficile*, Hôtel-Dieu de Lévis (Québec) 2004 to 2013.



The pink line represents the average incidence of *C. difficile* infection in Quebec hospitals, expressed in number of cases of nosocomial infections acquired in 10,000 patient-days.

Potential conflict of interest: None

Figure 2 - Incidence of nosocomial *Clostridium difficile*,
Hôtel-Dieu de Lévis (CISSS CA) (Quebec, Canada)
2011-2016

