

# Mighty Microbes



September 2010  
Volume 1  
No. 12

Clean hands + Clean environment =  
Infection Control

## It's Simple!

**COMMUNITY AND HOSPITAL INFECTION CONTROL ASSOCIATION-CANADA**  
Poster designed by Melody Cordoviz, BSc RN BScN CIC, Alberta Health Services, Edmonton, Alberta 2010  
Poster Contest sponsored by: **ICOLAB**

**NATIONAL INFECTION CONTROL WEEK**

October 18 – 22, 2010

### Bug Day is Educational – and Accredited!

Bug Day is Manitoba's largest healthcare education event. After attending Bug Day, you will be able to:

- Promote infection prevention and control principles and practices
- Promote hand hygiene awareness and safe health practices for the prevention of infection
- Identify emerging and existing pathogens, at-risk populations and situations relevant to the transmission of infection, and how we can modify these conditions

Bug Day is an accredited Group Learning Activity (Section 1) as defined by The Maintenance of Certification Program of The Royal College of Physicians and Surgeons of Canada, approved by the Office of Continuing Medical Education, University of Manitoba.

This program meets the accreditation criteria of the College of Family Physicians of Canada and has been accredited for up to 6 MAINPRO-M1 credits.

The Manitoba Pharmaceutical Association (MPHA) has accredited this program for a total of 6.0 CEUs (MPHA File No. 30171M) for pharmacists in Manitoba.

Attendance at Bug Day by Registered Nurses, Registered Psychiatric Nurses and Licensed Practical Nurses may contribute to fulfillment of their continuing competence program self-development plan.

Bug Day is accepted by the College of Medical Laboratory Technologists of Manitoba for continuing education credits.

Accreditation / Attendance Forms are available in the abstract booklet.

### Who Should Attend?

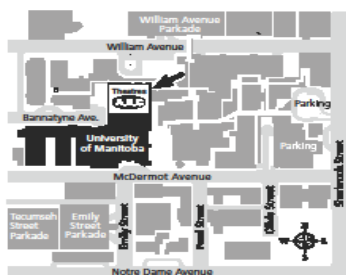
If you are interested in the prevention and control of communicable diseases, as well as health issues in the community or healthcare setting, then Bug Day is for you! Registration is not required.

### Bug Day Needs Your Support!

Please bring a cash donation, or make a donation online at [www.hscfoundation.mb.ca](http://www.hscfoundation.mb.ca). (Choose Donate Now Button and direct your donation to the "Bug Day fund" in the drop down box). Receipts for tax purposes will be issued by the Health Sciences Centre Foundation for donations of \$20 and more or upon request.

### Join Us at Bug Day in Person

Frederic Gaspard Theatre (formerly Theatre A), Theatres B & C  
Basic Medical Sciences Building  
University of Manitoba Bannatyne Campus



### ...or by Telehealth

Bug Day will be broadcast through MBTelehealth.

To confirm availability at your location:

- Contact your local MBTelehealth Coordinator
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Health Sciences Centre  
Winnipeg  
presents  
**THE 14th ANNUAL**  
**BUG DAY**  
Tuesday,  
October 19th, 2010  
During National Infection Control Week

University of Manitoba Bannatyne Campus  
Frederic Gaspard Theatre  
Basic Medical Sciences Building  
730 William Avenue  
Winnipeg, Manitoba

## About Bug Day

Bug Day is a full day of presentations and discussion on timely topics in infectious diseases, public health and infection prevention and control. These topics reflect input from attendees at the previous year's event and issues of current interest in healthcare. Our presenters are local, national and international authorities in the areas which they address.

Thank you to our sponsors and to Health Sciences Centre Winnipeg. We couldn't do it without your support!

For more information, call (204) 787-4654 or visit [www.hsc.mb.ca](http://www.hsc.mb.ca)

Visit site to download abstract booklet, brochure, and other important material

## Bug Day Agenda

0700-0730	Coffee, Juice, Muffins	1100-1130	<b>It's on your Hands: Germs and More</b> Molly Blaise, RN Infection Prevention and Control Unit Health Sciences Centre
0750-0800	Opening Remarks Fred Auld, MD Section of Infectious Diseases, Department of Medicine University of Manitoba	1130-1200	<b>Tales from a Germ Detective</b> Robert Mandl, CPHI Manitoba Health
0800-0855	Medical Grand Rounds Infection Control: Never a Dull Moment! John Embil, MD Infection Prevention and Control Unit Health Sciences Centre	1200-1300	Exhibits / Lunch on your own
0835-0900	Announcements	1300-1315	Announcements
0900-0930	What Have We Learned from the H1N1 Pandemic? Joel Kettner, MD Chief Provincial Public Health Officer Manitoba Health	1315-1345	Fever in the Immunocompromised Host: An Infectious Disease Emergency Matthew Seibel, MD Leukemia/Bone Marrow Transplant Unit Health Sciences Centre and CancerCare Manitoba
0930-1000	Exhibits / Nutrition break provided	1345-1415	Things that Go BITE in the Night: An Overview of Medically Important Ectoparasites Terry Galloway, PhD Department of Entomology University of Manitoba
1000-1030	Forgotten But Not Gone: The Polio Virus Gregory Hammond, MD Section of Infectious Diseases Department of Medicine University of Manitoba	1415-1445	Exhibits / Nutrition break provided
1030-1100	Rabid in Manitoba! Rabies Revisited Tim Hildeman, MD Manitoba Health	1445-1515	Welcome to Canada! Health Assessment for Refugees Pierre Plourde, MD Winnipeg Regional Health Authority
		1515-1545	<b>The Face of Infectious Diseases: Dermatologic Manifestations of Common Infections</b> Shane Sivek, MD Section of Dermatology Department of Medicine University of Manitoba
		1545-1600	Closing Remarks



UNIVERSITY  
OF MANITOBA



**Seminars in Infectious Diseases and Medical Microbiology and the  
Canadian Antimicrobial Resistance Alliance (CARA) and National  
Microbiology Laboratory**

2010 Antimicrobial Resistant Infections Seminar Series

***"Clostridium difficile Associated Disease-CDAD Symposium"***

**Tuesday, December 7, 2010**

- 8:00 – 9:00 am**                      **Department of Internal Medicine – Grand Rounds**  
**Dr. Tom Louie, Professor**  
**Departments of Medicine, Microbiology & Infectious Diseases**  
**University of Calgary**
- "Clostridium difficile Associated Disease"*
- Location:**     **Theatre A, Basic Medical Sciences Building**
- 9:00-9:30 am**                      **Coffee Break** (Coffee, juice & muffins provided)  
**Location:**     **Joe Doupe Concourse**
- 9:30-12:30 pm**                      **Symposium - *Clostridium difficile* Associated Disease – CDAD**
- Speakers:**  
**Dr. Tom Louie (University of Calgary) [Keynote]**  
**Dr. Michael Mulvey (National Microbiology Laboratory)**  
**Dr. John Embil (University of Manitoba)**  
**Dr. Michelle Alfa (University of Manitoba)**
- Location:**     **Apotex Centre – Lecture Theatre 071**
- 12:45-2:00 pm**                      **Lunch** (Sandwiches, coffee, juice, dainties provided)  
**Location:**     **J.A. Hildes Concourse**

**Hosted by Drs George Zhanel and Ethan Rubinstein**

## APIC TO EXPAND OFFERINGS THROUGH APIC ANYWHERE™ ONLINE EDUCATION CENTER

Washington, September 10, 2010 – In an effort to increase access to essential infection prevention education, the Association for Professionals in Infection Control and Epidemiology ([APIC](#)) today announced the addition of three new courses to its APIC ANYWHERE™ online education center.

The new offerings further enhance the scope of this interactive learning portal and will bring additional high-quality, cost-effective education developed by leading experts in infection prevention to more of the nine million healthcare workers who impact patient safety.

“APIC ANYWHERE offers a practical solution for healthcare facilities struggling with declining education budgets,” said APIC CEO Kathy Warye. “With an increased focus on eliminating healthcare-associated infections, it is imperative that all healthcare personnel are well-prepared to meet the daily challenges of preventing infections. APIC ANYWHERE provides healthcare professionals in any setting with the critical infection prevention tools and resources they need.”

Launched in 2009 by the association, [APIC ANYWHERE™](#) provides comprehensive, evidence-based healthcare-associated infection (HAI) reduction strategies, education, and training. Accessible anytime, anywhere, APIC ANYWHERE™ delivers credible, essential content in a user-friendly, interactive format.

New APIC ANYWHERE™ course content includes:

**Essentials of Infection Prevention™ (EIP)** – a thorough, competency-based review of the basics of infection prevention geared to all healthcare workers

**Microbiology 101 for Infection Preventionists** – a self-directed, comprehensive course on microbiological concepts that will aid decision making in infection prevention practice

**EPI Primer** – a fundamental understanding of infection prevention and the varied roles and responsibilities of infection preventionists to enhance collaboration in the advancement of patient safety

Through APIC ANYWHERE™, users also have access to:

**APIC Text Online** - the complete, searchable reference tool for infection prevention

**Webinars** – 60-90 minute live and archived presentations on current issues in infection prevention

**Healthcare-Associated Infection (HAI) Elimination Library** – in-depth training on critical infection prevention topics

**Certification Review** – review course for those seeking the certification in infection control (CIC) designation

CEUs are available for many of the APIC ANYWHERE™ course offerings. Additional benefits include the availability of technical support and an e-learning transcript that keeps track of the user's education in infection prevention. For more information, visit [www.apic.org/anywhere](http://www.apic.org/anywhere).

Financial assistance for the development of APIC ANYWHERE™ has been provided in the form of unrestricted education grants by the following companies: Ecolab (Founding Supporter), and 3M, BD, and Ethicon (Innovation Supporters).

## **From the National Advisory Committee on Immunization Statement, August 2010:** Overview and Summary of Changes

The seasonal trivalent vaccine for 2010-2011 incorporates the pandemic 2009 influenza A (H1N1) (pH1N1) component, a new influenza A (H3N2) component and the same B component as last year.

Immunization programs should focus on those persons at high risk of influenza-related complications, those capable of transmitting influenza to individuals at high risk of complications and those who provide essential community services. As circulation of pH1N1 is anticipated in the coming season, there is support to consider offering vaccine (2010- 2011 TIV containing the pH1N1 strain) to healthy persons who might not be included in the usual provincial program as well as continuing to target those considered to be at high risk of serious outcomes from pH1N1. For 2010-2011, NACI recommends that three additional groups that experienced a higher incidence of severe outcomes during both waves of the pH1N1 pandemic be considered as priority recipients for influenza vaccine. These new groups are persons with morbid obesity, Aboriginal peoples and children 2 to 4 years of age.

The 2010-2011 statement also contains updated epidemiological information from the 2009 pH1N1 pandemic. There is updated product information on the available formulations, including Agriflu<sup>®</sup>, which was recently authorized in Canada for use in persons aged 6 months and older. The other newly authorized product, Intanza<sup>®</sup>, will be addressed by NACI at a later date. NACI continues to recommend two doses of TIV for children under age 9 with no prior TIV, and one dose of TIV per season for children who have previously received one or more doses of TIV. This recommendation applies whether or not the child received monovalent pH1N1 vaccine in 2009-2010.

## **ASSOCIATION OF MEDICAL MICROBIOLOGY AND INFECTIOUS DISEASE (AMMI) CANADA**

### **Infectious Disease Specialists & Medical Microbiologists Comment on New Delhi metallo-beta-lactamase 1 (NDM-1)**

August 16, 2010 (Ottawa) – The recent news of the emergence in Europe of the new antimicrobial resistant bacteria, NDM-1 Enterobacteriaceae, and report of two cases in Canada reinforce the need for us to focus on strategies to prevent antimicrobial resistance. The Association of Medical Microbiology and Infectious Disease (AMMI) Canada is confronting the over-use and misuse of antimicrobials as a key step. The emergence of new global threats like NDM-1 Enterobacteriaceae also highlights the need for surveillance of antimicrobial resistant bacteria and science to support prevention and control efforts.

“The primary public health preventive efforts should not be on finding the "bad bug" coming from the "bad place". The only real protection from the emergence and transmission of these resistant microbes lies in improving our use of antimicrobials and the physical facilities and human behaviours that contribute to their spread,” says Dr. Jim Hutchinson, Professor of Medical Microbiology at Memorial University of Newfoundland.

Infectious Disease doctors and Medical and Clinical Microbiologists provide expert guidance in the use of antimicrobials, and collaborate in developing and evaluating infection prevention and control strategies.

“While there is no need to panic about this [NDM-1], it certainly is a red flag. The relatively quick global spread of resistance to what we generally consider our last line of antibiotics against Enterobacteriaceae - which are common causes of infection - needs serious attention,” says Dr. Lynora Saxinger, Chair of the AMMI Canada Antimicrobial Stewardship and Resistance Committee.

AMMI Canada members are working with federal and provincial authorities on gathering the medical and scientific data needed to respond effectively to antimicrobial-resistant infections. Dr. Saxinger is chairing a group working on establishing national antimicrobial surveillance and promoting antimicrobial stewardship in Canadian hospitals. Careful attention to routine infection control practices (including meticulous hand hygiene and cleaning of shared medical equipment) is critical to prevent spread within healthcare settings.

Dr. Saxinger commented further, “Antimicrobial resistance is a major public health threat overall. New drug development has slowed but resistance has done nothing but increase since we started using antibiotics to treat infections in humans and animals. Careful and judicious antibiotic use - saving them for when they are really needed – is one of the most important things we can do to preserve their usefulness for ourselves, our kids and our grandkids.”

## Canadian Patient Safety Institute

### Message from Hugh MacLeod, CEO:

**Thank you to those who provided feedback** on our first Quarterly Update. Your input is important to us in deciding future topics.

**You, our partners, have set sights on improving patient safety.** To help you move towards an ideal future state we are in the process of changing how we do business at CPSI, including the development of a new strategic plan.

**There is only so much capacity to embrace new initiatives.** We will seize every opportunity to leverage our limited resources – co-investment is more powerful than single-source funding. We will align our priorities with provincial/territorial and national standards and align our activities with jurisdictional policies and priorities. We aim to be a responsive, agile, and selective organization driven by whatever it takes to help our partners to make healthcare safer.

**Safer Healthcare Now! is a galvanizing force for patient safety.** Our aim is to expand its breadth and impact. We will support it with programs and activities that improve governance, build patient safety competencies, improve monitoring, measuring and reporting, generate new knowledge in high priority areas, and raise knowledge transfer to a new level of excellence. We will listen to the realities of what is happening in the

Canadian healthcare system from both the patient and provider perspective. We will plan our initiatives on what their experiences tell us must be done.

**Knowledge Transfer is key.** In our last Update we mentioned that CPSI is exploring new approaches to capture patient safety practices and design knowledge transfer points. I am pleased to advise that this month we are taking a baby step by launching what we call the *Patient Safety Crosswalk* – a hub connecting patient safety news and information from healthcare organizations across Canada. The Patient Safety Crosswalk will provide a space for clinicians, educators, researchers and others to have easy access to current projects, research and successes in patient safety from across Canada in order to enhance their own work. To find out more, please email [alidina@cpsi-icsp.ca](mailto:alidina@cpsi-icsp.ca).

## **This Quarterly Update focuses on three inter-related activities that support the advancement of patient safety:**

1. An economic evaluation of patient safety
2. A new patient safety education program
3. An overview of the *Safer Healthcare Now!* online data system

### **1. An Economic Evaluation of Patient Safety**

The Canadian Adverse Events Study (Baker Norton et al 2004) was a landmark study that provided the first estimate of the incidence of adverse events in Canadian hospitals. Since then, very few studies have captured the economic implications associated with adverse events in healthcare. International research results demonstrate that healthcare-associated harm does add to healthcare costs. Some studies have found that additional hospital costs are in the range of 13-16%.

A Canadian approach would be instrumental in understanding the average costs in selected adverse events, enabling policy and decision-makers to explore the potential for improving patient safety to help avoid healthcare expenditures.

In an effort to understand the true financial costs of adverse events, the Canadian Patient Safety Institute is supporting research to create a framework for conducting economic evaluations in patient safety. CPSI is proud to support Dr. Edward Etchells, Associate Director of the University of Toronto Centre for Patient Safety, and co-Principal Investigator, Dr. Nicole Mittmann, of Sunnybrook Health Sciences Centre, who will lead this important research entitled *The Economic Burden of Patient Safety*. The team was recently awarded \$116,000 in research funds and is being supported through unrestricted grants from 3M Health Care and Baxter.

This research will provide healthcare organizations with valuable information:

- An estimate and order of magnitude of the economic costs they bear as a result of current patient safety practices/adverse events;
- A highlight of key initiatives that could be used to reduce adverse events and the associated economic costs; and
- A prioritization of areas for future research in patient safety.

The results of their work will be the foundation for economic evaluations in patient safety. The result will be made publicly available by June 2011 at: [www.patientsafetyinstitute.ca](http://www.patientsafetyinstitute.ca).

### **2. Patient Safety Education Project-Canada**

- Take your patient safety efforts to the next level!

- Build capacity for patient safety in your organization!

This fall, the Canadian Patient Safety Institute, in partnership with Northwestern University, will be offering the Patient Safety Education Project-Canada (PSEP-Canada).

**Why This Program?** Built on a train-the-trainer model, PSEP-Canada is one response to the challenges that remain in integrating fundamental patient safety practices into the routine delivery of healthcare. Despite the existence of considerable information about how to improve care, there remains insufficient education in patient safety for a broad base of healthcare personnel. Where education is available, there are challenges with how to actually use the knowledge that is taught. As well, obtaining knowledge from incident reporting efforts is in its early stages and must be broadened. There must be alignment among the many systems within the healthcare workplace, across healthcare organizations, and with external forces such as regulatory bodies. PSEP-Canada addresses these and other challenges by combining dissemination of existing knowledge with steps to translate this knowledge into better patient safety practices and thus, better outcomes.

**Who Trains the Trainers?** In May, CPSI put out a national call for interested Master Facilitators – professionals who are passionate about patient safety work and have the proven skills and ability to motivate change. The role of Master Facilitator is to teach colleagues to become Patient Safety Trainers in their home organization. CPSI had an exceptional response to the national call. As a result we now have a group of individuals from across Canada comprised of professionals that are inspirational, creative and adaptable who will lead the charge for PSEP-Canada and provide a new emphasis on learning and change.

**Join Us! Become a Patient Safety Trainer.** Starting this fall, CPSI will be hosting “Become a PSEP-Canada Patient Safety Trainer” conferences for clinicians, administrators and other professionals who have an interest in patient safety. The 2 ½ day sessions will prepare attendees to:

- Deliver a high-impact, comprehensive patient safety curriculum;
- Utilize effective teaching approaches based on adult education methods;
- Promote effective fundamental patient safety practices in their organization; and
- Foster a culture of patient safety.

PSEP-Canada Patient Safety Trainer is a competitive process that also requires commitment from an executive leader within the organization to participate in the final half-day of the Become a PSEP-Canada Patient Safety Trainer conference and to support dissemination in their home institution.

The PSEP-Canada approach to improving patient safety is to include the maximum number of people in an organization to reach a tipping point where patient safety practices are integrated into the culture of the organization. A new emphasis on learning and change is necessary and PSEP-Canada provides another exceptional tool for healthcare organizations to more effectively drive patient safety improvements.

For more information about PSEP-Canada visit our website: [www.patientsafetyinstitute.ca](http://www.patientsafetyinstitute.ca) or contact Abigail Hain at [ahain@cpsi-icsp.ca](mailto:ahain@cpsi-icsp.ca).

### **3. Safer Healthcare Now! New Online Data System – Measuring Your Success:**

Measure your progress on topics such as: reducing central line infections, improving care for AMI patients, medication reconciliation, surgical site infections, and more.

Build capacity for patient safety in your organization by having data to create new conversations at the governance and operational levels.

The Canadian Patient Safety Institutes recognizes that measurement is a critical part of patient safety improvement work. Starting in September, *Safer Healthcare Now!* (SHN) will begin rolling out “Patient Safety Metrics.” This new online data submission and reporting system replaces the cumbersome excel measurement worksheets with a completely redesigned and user friendly web-based tool. The primary goal of this new system is to streamline the enrollment and data submission processes, enhance reporting capabilities and increase access to data.

**Who helped create the new system?** *Patient Safety Metrics* was guided by a steering committee with representation from national and provincial healthcare bodies such as Accreditation Canada, Canadian Institute for Health Information (CIHI), Canada Health Infoway, the Ontario Ministry of Health and Long-Term Care, the SHN Central Measurement Team (CMT), as well as the SHN Nodes.

The goal when developing this new system was to keep the end-users' needs front and centre. *Safer Healthcare Now!* completed an extensive consultation with its teams, partners, funders and stakeholders. The Patient Safety Metrics system is *Safer Healthcare Now!* and CPSI's response to what we heard from you.

**Benefits of the new system:** *Safer Healthcare Now!* teams will have the opportunity to experience many benefits of the Patient Safety Metrics system. First, the process of data submission has been streamlined and simplified; the system is easily accessible, intuitive to use, simple to navigate, and barriers to data submission have been minimized.

Second, the Patient Safety Metrics system provides enhanced access and transparency to Canadian patient safety data and reports. The system will be able to pull both the historical *Safer Healthcare Now!* data and current data from a central data source and provide access to real-time performance reports.

Third, reports will allow for analysis and benchmarking of data across time, sites, organizations and provinces. The Patient Safety Metrics system will allow a team to track their individual performance over time, as well as compare their performance against other hospitals in their region, other regions in their province and the other provinces and territories across the country.

**The Roll-Out.** As Patient Safety Metrics expands into phase II of its development, teams will have the ability to custom build dashboards and multi-site indicator reports that can serve multiple reporting needs across an organization.

Over the past month numerous *Safer Healthcare Now!* teams have been testing the system and we are continuing to make modifications as needed. So far feedback has been positive and we are committed to continuing to work with the provinces, territories and national bodies to create a common single source database for Canadian patient safety data.

To help teams get started, virtual training sessions will be held for each node across the country and SHN staff will be available to guide users through the system and respond to questions from the field.

If you would like to learn more about the Patient Safety Metrics system or request a demonstration of the system for your province or region please contact **Anne MacLaurin** at [amaclaurin@cpsi-icsp.ca](mailto:amaclaurin@cpsi-icsp.ca).



Health

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Communicable Disease Control Branch  
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T 204 788-6737 F 204 948-2040  
www.manitoba.ca

August 6, 2010

Dear Colleague:

### **ALERT: Increase in Pertussis Cases**

#### **Recommended Actions**

Encourage up-to-date immunization for pertussis, particularly for travellers and adults who are in regular contact with infants.

Consider pertussis in the differential diagnosis and management for clients presenting with consistent symptoms.

Report any pertussis cases or unusual pertussis activity to Public Health as per the *Public Health Act's* Notifiable Disease requirements.

#### **Increase in Pertussis Cases**

A higher than expected number of pertussis cases have been reported this year in two American states: California, and Idaho.

Cases in California have been associated with 112 hospitalizations, five (5) infant deaths (all under two months of age with no previous pertussis vaccinations), and 700 more suspected cases.

Manitoba has also seen an increase in reported pertussis cases in recent years.

Please refer to the *Pertussis/Parapertussis Protocol (November 2007)* for information on case definitions, reporting requirements, laboratory diagnostic testing, case and contact management and outbreak management, available at: <http://www.gov.mb.ca/health/publichealth/cdc/protocol/pertussis.pdf>

For urgent public health consultation contact your regional Medical Officer of Health or call (204) 788-8666 outside regular office hours. Thank you for your anticipated cooperation.

Sincerely,

"Original signed by"

Val Steeves

A/Director, CDC Branch

## FEATURE ARTICLE: **The experience of source isolation for *Clostridium difficile* in adult patients and their families**

Monica Pacheco, N., BscN, M.Sc (A)<sup>a</sup>, Vanessa Spyropoulos, N., BscN, M.Sc(A)  
II<sup>a</sup> & Isabelle Caron, N., M.Sc.N<sup>b</sup>(Clinical Project Advisor) Nursing Director of Medicine, Geriatrics and Psychiatry

### ABSTRACT

**Study purpose:** To explore the isolation experience for *Clostridium difficile* positive patients and their families on an in-patient unit.

**Sample/setting:** Convenience sample of 10 (five patients-five family member dyads) recruited from in-patient units of a university affiliated teaching hospital.

**Methods:** A qualitative, descriptive design with semi-structured interviews.

**Results:** Loneliness was experienced by patients due to lack of visitation. Uncertainty regarding illness trajectory was felt by patients and family members. Both groups described different modes of bacterial transmission. Hyper vigilance of the transmission process was also noted. Bedside nurses provided most of the teaching regarding the infection and isolation. Inconsistencies in the provision of information and implementation of the isolation protocol were experienced by the patients and their family members and were linked to emotional distress. Both group expressed concern when *C. difficile* positive patients were cohorted in multi bedded rooms.

**Implications for practice:** Health care professionals, and more specifically nurses, need to be informed on the impact of isolation for *C. difficile* and hospital-acquired infections (HAI) and explore the psychological impact of isolation in HAI on patients and families, in order to help them adapt and address their concerns. In order to minimize inconsistencies a standardized process for the provision of information regarding *C. difficile* infection and isolation measures needs to be implemented at time of diagnosis and throughout the illness trajectory. This process may help to mitigate some of the uncertainty and emotional distress experienced by patients and families. Isolation measures must be consistently observed by hospital personnel and visitors. When departure from best practice occur, such as cohorting infected patients, health care providers need to provide clear and consistent information to patients and families explaining the rationale for the change and the precautions that will be taken to ensure their safety.

### INTRODUCTION

#### **Definition, risk factors, and complications of *Clostridium difficile***

*Clostridium difficile*, commonly known as *C. difficile*, is a bacterium that may result in serious or life threatening intestinal conditions for hospitalized patients (1,2). *C. difficile* is a spore-forming Gram-positive anaerobic bacillus which may cause diarrhea and is shed in feces, thus any surface contaminated with stool can act as a reservoir for this microbe, which is transferred to patients via the hands of healthcare personnel (3,4). Risk factors associated with *C. difficile* associated disease (CDAD) are advanced age, co-morbidities, immunocompromising therapy, gastrointestinal surgery, prolonged hospital stay, and most importantly, antibiotic consumption (5-10). Complications associated with *C. difficile* include pseudomembranous colitis, toxic megacolon, perforations of the colon, sepsis and possible death(1).

#### **Incidence and prevalence of *Clostridium difficile***

*C. difficile* is the most commonly reported hospital-acquired infection (HAI) in health care settings (6,10,11). In fact, between 2002 and 2004, there was a marked increase in the incidence of CDAD in Quebec health care institutions ranging from 12.8-45.0 per 1000 admissions, which is approximately 4-5 times the rate two years previously (8). In Quebec, 7004 cases of *C. difficile*

were reported between April 2003 and March 2004, (double the cases four years prior), during which 1270 people died after contracting the infection 912). As a result of this outbreak, the Quebec government provided \$30 million to hospitals in the province to buy additional equipment and hire infection control personnel (13).

Hospitalized patients discovered to be infected with this bacterium are placed on isolation precautions, due to the ease of transmission of the spores that may lead to serious or perhaps life-threatening infection, yet it is necessary to first review previous research on the isolation experience to appreciate the impact of these precautions.

### **Past literature on the isolation experience**

The literature reveals that adult patients under isolation precautions have identified diverse features of the isolation experience. Positive aspects cited included privacy (14-16), solitude and increased control over daily activities (e.g. sleep, watching television and talking to visitors) (14), whereas negative aspects included stigmatization (14,17), and decreased attention from staff (14,15,18). Descriptions of isolation as prison-like, traumatic (17) and confining (16,19) also have been reported.

Several studies examining the psychological impact of isolation on adult patients with a range of infections have revealed that anxiety and depression are common (5,19-22). Moreover, as quasi-experimental study found statistically significant higher levels of anxiety and depression and lower levels of self-esteem and sense of control in isolated patients than in non isolated patients, and several of the patients under study were *C. difficile* positive (23). The two patient groups were similar in age and sex, thus ensuring comparable groups.

### **Impact of isolation procedures for *Clostridium difficile* on patients and families**

In order to prevent the spread of this microbe via contact transmission, hospitalized patients infected or suspected of infection with this microbe are placed on source isolation, which involves being placed in a single room. Thorough hand washing has been recognized as the most effective means of preventing contact transmission. Furthermore, protective barriers (masks, gloves, gowns) must be worn by staff and visitors before entering the patient's room and a sign is posted on the patient's door detailing the use of protective barriers (3,7,11,22,24,25). Very few studies have explored the experience of source isolation for *C. difficile* infection in adult patients. Furthermore, the families' perspective has received little or no attention. A study which includes the family perspective will reflect the central tenet of the McGill Model of Nursing in which the family is the unit of care (Gottlieb & Sherrard, 2004; unpublished work).

Isolation precautions hinder patients' ability to communicate with staff and loved ones (14), and friends and family are hesitant to visit (19), perhaps due to fear and lack of understanding of *C. difficile*.

### **Nursing perspective and study purpose**

The isolation experience for *C. difficile* infection constitutes an important area of inquiry, as this disease is becoming a large scourge in the health care setting and can be life-threatening. Nurses can actively collaborate with these patients and their families to alleviate suffering and improve coping, thus advancing knowledge and guiding practice.

The review of the literature revealed only two studies that included patients with *C. difficile* infections, yet the search failed to yield articles with a primary focus on adults with *C. difficile* infection. In addition, no studies specifically explored the experiences of family members. The high levels of anxiety and depression demonstrated in *C. difficile* patients in the above research, coupled with the potentially life-threatening course of this infection, suggest that these patients are suffering. The central role of the nurse is to promote the health of patients and families by easing physical and psychological suffering, thus a study examining the experiences of *C. difficile* infected patients and

their families while under isolation precautions will provide information to fulfill this role and further understanding of how nurses can minimize the suffering of these individuals. Therefore the proposed study sought to improve patient and family care by answering the following research question: What is the isolation experience of *C. difficile* positive adult patients and their families on an inpatient unit?

## METHODS

### Design

A qualitative descriptive design permitted the understanding of the isolation experience of *C. difficile* positive patients and their families. Such an approach allows one to obtain rich holistic illustrations of this poorly understood phenomenon (26). The Canadian Journal of Infection Control Fall 2010

### Sample

A convenience sampling method was used to obtain a sample of 10 participants, that is, five adult hospitalized patients with *C. difficile* infection and five family members (one family member per patient). (See tables 1 and 2 for demographic information.) Only pairs of individuals, that is, one patient and his or her family member were accepted into the study. If one member of the pair declined to participate the other was deemed ineligible. If several family members wished to participate, the patient was asked to choose one to take part in the study. The latter was one whom the patient recognized as a primary support individual, such as a spouse, sibling, caregiver or friend, and who agreed to take part in the study.

This family member regularly visited the patient (i.e. at least once per week) and experienced isolation procedures for *C. difficile* infection. Further criteria included ability to speak English or French. The sample was recruited from various inpatient units, (i.e., medicine, geriatrics, cardiac, stroke) of a university affiliated teaching hospital.

The head nurses and resource nurses of the units approached patients and families to determine their interest to participate. The student researchers spoke with interested individuals to inform them of the study. The study received ethical approval from the institution.

Table 1: Patient demographic data

Patient	Age	Sex	Ethnic origin
1	69	M	Russian
2	52	F	French-Canadian
3	80	F	Jewish
4	80	F	Italian
5	52	F	Jamaican

### Data collection

Data were collected via semi-structured interviews. Patient interviews were conducted in the patients' rooms, as the infection requires isolation, hence another setting would not be feasible. The timing of the interview was negotiated between the hospital staff and patients. Family members were interviewed separately from patients, as either party may have felt uncomfortable disclosing information in the presence of the other. A separate private location on the hospital unit, such as a conference room, was used for the interviews with family members.

Data collection took place from July to October 2008. The interviews were conducted on the same day or within the same week for each patient/family member dyad. Data transcription took place following the interviews. Due to time constraints, only one interview was conducted with each participant.

The interviews were conducted by one of the researchers and audio-taped.

Patients and family members were questioned about their experience with isolation measures for C. difficile and their understanding of the infection and the isolation procedures. Each interview lasted approximately 30 minutes, use of open-ended questions encouraged participants to share their experiences.

### **Trustworthiness**

The trustworthiness of qualitative research is based on credibility, confirmability, dependability, and transferability (26,27). Credibility was achieved by validation of the data and interpretations throughout the interview. Investigator triangulation also contributed to credibility. This entailed analysis of the transcripts by the two researchers independently, followed by a comparison of individual results, as collaboration enhanced the validity of the interpretation (26). Confirmability and dependability were ensured via an audit trail (28), as a record book of decisions regarding data collection, analysis, and the overall study was maintained. A clear description of the study sample and the setting enhanced the transferability of the findings (29,30).

### **Data analysis**

Colaizzi's analysis method was used throughout the study (26,31). Each interview was transcribed verbatim, and field notes were written by the student researchers after each interview. The transcripts and field notes were reviewed frequently in order to become immersed in the data. The patient data were handled separately from the family data, although the analysis of each group was conducted concurrently.

First, line-by-line coding of the raw data involved highlighting text related to the research questions and assigning a label that remained as close to the original data as possible. Each researcher conducted line-by-line open coding for their interviews. The data codes were then clustered into larger categories. The categories were reviewed by the senior member of the team and the results of the preliminary analysis were discussed until a consensus was reached. This reduced the chance for bias and enhanced the credibility of the findings. A back-and-forth process of analysis ensued whereby new categories that emerged from later interviews guided the reanalysis of the data that had been collected at the outset of the study.

### **Ethical considerations**

Ethical approval was obtained from the Ethics Review Board of the participating institution prior to initiation of the study. The study purpose, expectations of participants, and potential risks and benefits were explained by one of the student researchers to each potential participant.

Additionally, participants were informed that study participation was voluntary, that they had the right to end their involvement at any time, without impact on their own care or that of their family member and that interviews would be audio taped. The patients were interviewed separately in their rooms, whereas the family members were seen in another room in the hospital. If concerns arose during the interviews that were beyond the study's scope, the researcher with the participant's permission, informed the appropriate personnel for follow up.

Confidentiality was maintained by storing any identifying information in a locked cabinet at the hospital, and by replacing data identifiers with a code. Code lists are currently kept separately from the consent forms. The audio recordings and data transcriptions will be kept in a separate locked cabinet in a locked room for a period of five years and will then be destroyed.

**Table 2: Family member demographic data**

<b>Patient</b>	<b>Age</b>	<b>Sex</b>	<b>Ethnic origin</b>	<b>Relation to patient</b>
1	83	F	Romanian/Austrian	Partner
2	25	M	French-Canadian	Son
3	52	F	Jewish	Daughter

4	52	M	Italian	Son
5	16	F	Jamaican-Canadian	Daughter

## RESULTS

Four emergent themes in the patients' and families' experiences with isolation for *C. difficile* infection became apparent during the interviews. Patient and family data were analyzed separately, and, interestingly, three themes were common to both groups, however each group had a unique perspective. Loneliness related to isolation measures was a central feature of the patient experience, but not the family member. Shared experiences for patients and family members included: uncertainty related to the illness trajectory, the transmission process, which included understanding transmission and hypervigilance, and the lack of consistency, which included inconsistencies regarding provision of information, and the implementation of the isolation protocol by health care providers HCPs.

### Loneliness related to isolation measures

*C. difficile* infection and its isolation measures contributed to a feeling of loneliness due to lack of visits from friends and loved ones. When asked to describe the experience of being in isolation for *C. difficile*, one patient immediately responded with the statement: "I get lonely, you know...lonesome." Several patients reported few visitors. The lack of visitation may have been linked to visitors' fears of contracting the infection, as noted by one of the patients: "Some did not visit because I had *C. diff*. They were scared." This sense of loneliness arose primarily from decreased contact with loved ones. Patients reported no perceived change in the frequency of interaction with HCPs. Most did not feel that the care they received from HCPs was reduced by isolation measures. On the other hand, isolation procedures sometimes resulted in the use of single rooms, and according to one patient, this created a sense of "being cut off from the usual."

### Uncertainty related to illness trajectory

The feeling of uncertainty related to the trajectory of *C. difficile* infection was evident for both patients and family members. This sentiment was expressed by patients with respect to their own health status. When asked if he had any specific questions about *C. difficile*, one patient participant immediately asked, "How long does this disease last?"

For family members, their uncertainty became apparent when they questioned the length of the illness trajectory. One participant repeatedly asked about the trajectory: "How long does it go on? How long does it take? No one can give you a definite answer. . . But how long does it go on? You know this is the third week? Doesn't that send you like a message if it's over three weeks? So what does that mean? And here it is like three weeks later, he's still on isolation."

The repetition of such questions highlighted the significance of this concern for the participant. These sentiments were echoed by another family member who also asked, "How long does it (infection) last? I thought it was resolved. . . There's no such thing as a relapse? Like a couple of days later?"

The uncertainty of the illness trajectory led to a great deal of concern for patients and family members.

### Understanding of the transmission process

The understanding and a hyper vigilance of the transmission process were also central themes in the experiences of both groups. There was considerable variation in patients' understanding of the process of transmission of *C. difficile*. One participant described the infection as one that is spread from contact with an ill individual: "You can pick up germs from contact with someone who is not well." In contrast, another believed that the infection was transmitted to patients from HCPs or other infected patients, that is, hospital acquisition of the infection: "There was a lack of asepsis between the circulating nurses and other personnel." This participant felt that HCPs "Did not pay attention to the (isolation) measures when they entered the room...I know that someone was not careful."

Another patient described becoming infected with “a hospital sickness.” She expressed her frustration in the hospital acquisition of the infection in the following statements: “When I came here I didn’t have it! So I got it here!” The remaining two patients were unable to articulate how the infection was transmitted.

Similarly, family members also spoke about the transmission process of *C. difficile*. A family member expressed her family’s frustration with the hospital acquired infection: “They were saying that it’s bad... they said that she came to the hospital to get better, not to catch a disease.”

Family members were particularly focused on the issue of transmission and how likely the infection could be spread from the patient to the family member and then to others. In contrast, some family members were concerned about spreading their own “germs” to patients. As a result, family members became engaged in an active process of attempting to understand the transmission process. For instance, one family member asked: ‘How did he get this? From how, from where?’ Another family member felt that isolation measures warranted careful attention by visitors, so as not to “bring other germs into the room.”

### **Hypervigilance of the transmission process**

Regardless of their focus, family members exhibited a hypervigilance of the transmission process that was manifested in their questions and increased focus on HCPs adherence to isolation measures. Family members expressed doubt as to whether the current isolation practices were adequate in preventing overall bacterial transmission: “I often wonder is that [the gown, gloves and mask] enough? They should give you little covers for your shoes at the same time, like they do in the surgery... I often think to myself, there’s the gown, and there’s the mask, and there’s the gloves, but what about headwear? What about footwear? I mean, they could carry little bugs too?”

Similarly, another family member was worried about transferring the bacterium to others: “It makes me nervous because I work in a preschool, and I’m wondering, like I bring my jacket into the room (refers to patient’s room), and I hang it up on either the doorknob or the hook; am I doing something that’s putting my children at risk? I could actually give my kids *C. diff*? From my coat? I’m wearing my coat, and they’re in preschool, I mean they sit on my lap.”

This hyper vigilance of the transmission process was a central theme to the family members’ experiences, and some patients also raised this issue. For example, one patient was keenly focused on reminding her family to follow the proper isolation measures: “I tell them to keep it (gown) on, put on the gloves, wash your hands... must take precautions. You have to follow what they say, because you don’t want to catch nothing.”

Clearly, the issue of transmission for *C. difficile* was an important topic for both patients and family members.

### **Lack of consistency in information provided**

Almost all family members noted a lack of consistency in the information provided by HCPs. Both patients and family members described a lack of consistency in the implementation of the isolation protocol by HCPs. Bedside nurses were described as the main information providers regarding *C. difficile* infection and isolation procedures in most units, doctors were also mentioned. Although family members were satisfied with the information they received, they did not feel that HCPs were forthcoming with information. For instance, one family member questioned the reported laboratory results in the statement, “They said the preliminary (report) was positive, but I haven’t heard anything about the other two (i.e., the final results).” Family members also reported inadequate provision of information regarding diagnosis and test results, as indicated in the following statements: “It hasn’t been a great experience, we’re sort of finding out things just incidentally. . it was like, did I miss something along the way? What happened?”

In answer to what, if anything, should be changed about the isolation process, this family member responded: “To be informed a lot better than we are now. I can’t imagine that I’m that dumb, and I don’t listen that poorly.”

### **Lack of consistency in the implementation of the isolation protocol**

The lack of consistency in the relaying of information was raised exclusively by family members. However, both patients and family members were concerned about the lack of consistency and adherence to the isolation protocol. One family member reported discrepancies between the protocol for isolated patients and actual practices. She related the scenario in which a doctor told her that the usual isolation measures stipulate that the patient cannot leave the hospital. On the other hand, this professional did not strictly enforce this policy: “The doctor said, you’re not really supposed to take them (patients) out, that’s the hospital policy. [But if you do go out] you should wipe things down.”

Similarly, another patient shared the following experience: “I would tell them (HCPs) that I would like it if they put on gloves...I think it would solve a lot of problems if everyone mimics each other (i.e., everyone follows the same isolation measures)...to be careful with all (isolation) measures.”

The ideal practice of physically isolating patients in single rooms was not always possible due to lack of private rooms across the institution. Patients were placed in multi-bedded rooms with others who were also infected with *C. difficile*. This led to concern and a state of confusion for one of the family members who explained: “When it was discovered that he had *C. difficile*, they rushed him out; he was before in another room, a semi-private. So they rushed him out right away and they put him into an isolation room. Then all of a sudden, he’s back in a semi-private room...if it’s supposed to be isolation, isolation is isolation!”

The strict adherence to the ideal practice of single rooms provided reassurance to participants of both groups. When asked what changes should be made to isolation measures, one family member stated, “I’d put him back in a single room, because to me that’s what isolation means.” This concern was verbalized by one patient who affirmed her preference for single bed isolation rooms.

One family member/patient pair expressed great concern when in a clinical area that did not allow for proper isolation measures, specifically the emergency department. This concern was captured by the following family member statement: ‘They let a lot of things go, especially in the emergency room. . .the first day she spent in the emergency room my mom was having diarrhea and they didn’t know where to put it (stool). They had to put it on the floor. That, I believe, is very dangerous for the whole emergency room. That’s my opinion, very, very sad and very, very dangerous.’

These perceptions of lack of consistency regarding information provided and in the adherence and the ability to implement the isolation protocol undermined the above participants’ sense of reassurance with the care provided.

## **DISCUSSION**

The findings of the current study illustrate the isolation experience for *C. difficile* positive patients and their families. Loneliness stemming from the isolation measures and reduced contacts with loved ones was central to the patient’s experience, a finding consistent with previous research (14-16,19). Uncertainty regarding the illness trajectory was expressed by patients and family members, which reflects the general literature on uncertainty in the illness experience (32). The continual questioning of the illness trajectory may be viewed as information seeking, which is a common response to uncertainty and may be considered a useful coping strategy (33).

Some patients and family members did speak about the hospital acquisition of the infection, which led to emotional distress. They viewed the hospitalization as a way of treating underlying illness for

which they were admitted, and not as a means of acquiring a novel infection. Indeed, the literature demonstrates the physical, social and psychological impact of hospital-acquired infections for patients and their families, such as fear, stigma and social isolation (35,36).

Patients and family members exhibited a hypervigilance in the adherence to the isolation measures by HCPs, possibly as an attempt to find a rationale for the hospital acquisition of the infection. The hypervigilance may also reflect efforts by the two groups to protect themselves from acquiring the infection and as a protective coping mechanism. The increased vigilance could indicate a lack of trust in the HCPs and in the hospital, since this is where acquisition of the infection occurred. Newton established that patients with methicillin-resistant *Staphylococcus aureus* (MRSA) believed that isolation measures prevented transmission of the infection, yet they did not indicate increased focus in HCPs' adherence to isolation practices (15).

The increased vigilance is a new finding that may potentially be unique to *C. difficile* infection, since this microbe has overt symptomatology (i.e. frequent episodes of diarrhea), as compared to other infectious agents. Patients and family members are witness to the symptoms of *C. difficile* and this observation, coupled with the potentially life-threatening course of this infection, may increase their guard against its transmission. They repeatedly questioned the effectiveness of the isolation measures, which appeared to elicit a sentiment of anxiety, although this emotion was not validated with the participants.

The lack of consistency in the information provided emerged only in the family members' experience. Perhaps the HCPs had inadequate knowledge regarding *C. difficile* infection, a phenomenon encountered in a small study. It found that infection control personnel had poor understanding of *C. difficile* despite an adequate knowledge of infection transmission (37), which may have led to inconsistencies. Perhaps patients had less informational needs or were more focused on their own illness management, other than *C. difficile*, and did not question the information provided, and were thus satisfied with it. This may be due to patients receiving their information primarily from HCPs, whereas family members had access to several information resources, such as HCPs and electronic and print media. Surprisingly, the opposite was illustrated in past research. Studies found that patients with diverse infections had information needs that were not adequately met by HCPs (16,17,35).

Lastly, patients and family members observed differing isolation practices performed by HCPs. The inconsistent use of isolation measures has been documented in previous literature (7,14,38). This inconsistency likely creates confusion, as the proper measures to follow become unclear and their importance is called into question. A strict adherence to the isolation protocol will likely increase the patients' and families' reassurance with personnel and will concomitantly enhance patient coping with *C. difficile* infection.

The physical layout of the hospital resulted in differing isolation practices. For instance, the Emergency Room (ER) did not have physical barriers and bathroom facilities necessary for proper isolation precautions, which was worrisome for both patients and family members. Hospital wards remain antiquated as they contain few single or isolation rooms (8). As a result, cohorting is prevalent. Multi-bedded rooms created anxiety and concern for patients and family members due to The Canadian Journal of Infection Control Fall 2010 the close proximity to other infected patients and led to emotional distress. There is thus a clear link between physical environment and coping with the illness, a phenomenon that has not been scrutinized in any depth in past literature.

Both groups were afraid of possible re-infection from the other patients. Very little research has looked at this issue of re-infection secondary to cohorting. However a study noted that patients who shared a room with another *C. difficile* positive patient acquired the organism after an estimated hospital stay of 3.2 days when compared with a hospital stay of 18.9 days for other patients (39). Another study found that moving a patient from the intensive care unit (ICU) into a single room did

not reduce the rate of cross infection for MRSA (40). The inconsistencies in previous research thus merit further exploration.

Single-bedded rooms are advocated as the gold standard in isolation measures, yet they stipulate that multi-bedded rooms are permissible only after consultation and approval by the institution's infection control department (3,24,41).

The most profound effect on patients and their families was the emotional impact of isolation for *C. difficile*. Given the resultant distress experienced by the patients and family members, there is a clear need to explore their coping in order to intervene therapeutically. The McGill Model of Nursing views the family as the unit of care. This model regards nurses as having a pivotal role in collaborating with families to assist them to cope with their concerns, hence it is ideally suited for working with *C. difficile* positive patients and their families (Gottlieb & Sherrard, 2004; unpublished work). As the above findings demonstrate, the intervention of providing information is inadequate to address their emotional needs. Nurses need to be attuned to the distress and anxiety felt by the patients and family members in order to better facilitate their coping.

## CONCLUSION

### Implications for practice

HCPs, and especially nurses, need to be aware of the psychological impact of the isolation measures and the acquisition of HAI, so that they may intervene accordingly. Relevant interventions to promote adaptive coping include active listening to understand the extent of the concern, providing emotional support and reassurance, reframing cognitions, and referral to appropriate personnel as needed (42). Based on the above findings, it is clear that nurses have a vital role in anticipatory guidance in preparing the patients and families for the experience beyond understanding the infection. For instance, nurses can describe the isolation measures such that patients and families will have an increased awareness of what to expect. Consequently, any questions or concerns can be addressed.

Bedside nurses were described as one of the main information providers. It is necessary to determine any gaps in nurses' knowledge regarding *C. difficile* and its isolation measures. Additional teaching should then be provided to nurses, such that they possess adequate knowledge to be shared with patients and families. Moreover there is a need for a proper assessment of both patients and families to determine ability to process the information provided, as emotionally charged and serious health situations are well known for not being conducive to learning and subsequent recall of information. The literature emphasizes the positive effect that the provision of information has on patient satisfaction and reduction of anxiety (7,16,43). Consequently coping may be facilitated for patients and families (43). Improved communication by HCPs via a standardized teaching process will ameliorate patients' and family members' experience (17).

Bedside nurses may use resources available to them, such as printed documentation and infection control personnel. The latter can be made available to patients and families to answer questions and provide information regarding the infection and the need for isolation.

Nurses and physicians need to collaborate and develop a standardized teaching tool to be put into practice with patients and families regarding *C. difficile* infection and isolation measures. This teaching process should begin at diagnosis and continue on throughout the infection's course. This standardized method of information giving may reduce anxiety, uncertainty, and confusion for patients and families. Furthermore, these professionals are in an ideal position to provide teaching, such that patient outcomes will likely improve. HCPs should be sensitized to the impact of their actions on patient and family anxiety regarding inconsistencies in their practice.

The health care institution's infection prevention and control guidelines should be strictly followed and implemented. There must be consistency of isolation measures across hospital personnel and visitors, in order to diminish cross-contamination and confusion regarding proper practices. Lastly, hospital administrators should make every effort to organize units in a manner that promotes the use of single isolation rooms. However given the current physical layout of hospitals, cohorting should only be implemented with the guidance of infection control personnel.

### Future directions

It would be interesting to compare patient and family members' isolation experience in single versus multi-bedded rooms, in order to determine the effect of physical environment on individual experience. As a result, the physical and human resources necessary to properly implement isolation measures will become apparent, and current practices will likely improve.

Previous literature did not examine the family experience for other infectious agents, such as MRSA or vancomycin-resistant enterococcus (VRE), thus such studies are needed, in order to gain a broader understanding of the patients and families' experience of source isolation. Patients in the present study were satisfied with information provided. This is in contrast to previous studies, where their informational needs were not adequately met, thus constituting a phenomenon that requires further exploration. It would also be worthwhile to explore whether family members' fears linking cohorting with re-infection are justified. Future studies should examine the incidence of re-infection of cohorted patients, in order to determine whether family members' fears are valid or unfounded. Future studies exploring staff nurses' perceptions regarding nursing patients and their families in isolation, would inform practice.

### Limitations

Study findings were not validated with the participants in a second interview, due to time constraints. This would have been useful, in terms of gaining a more in-depth understanding of their experience. Furthermore, the sample size of five patient/family member pairs was relatively small, hence the study should be repeated with a larger sample in different institutions in order to ensure a range of experiences. Specific demographic data such as education level and length of time in isolation were not collected, since the purpose of the study was an exploratory overview without the intention of identifying associations between the demographics and experience. However, these factors may have played a role in the participant's isolation experience, and therefore should be included in further studies of the subject.

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