Annex C:
Testing, Surveillance and Management of *Clostridium difficile*

In All Health Care Settings

Provincial Infectious Diseases Advisory Committee (PIDAC)

Revised: January 2013

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Suggested Citation:
Ontario Agency for Health Protection and Promotion, Provincial Infectious Diseases Advisory Committee. *Annex C – Testing, Surveillance and Management of Clostridium difficile*. Annexed to: Routine Practices and Additional Precautions in All Health Care Settings. Toronto, ON: Queen's Printer for Ontario; 2013.

Originally published: December 2004
Second Revision: January 2009
Third Revision: May 2010

NOTES

This document is intended to provide best practices only. Health Care settings are encouraged to work towards these best practices in an effort to improve quality of care.
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ISBN: 978-1-4606-1940-7

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This document is current to January 2013.

New material in this revision is highlighted in mauve in the text.

Summary of Major Revisions:

Page	Revision
1	• New definition for Small Community Hospital
3	• Results of mandatory reporting for *C. difficile*
5	• Summary of IPAC measures to prevent and control CDI
6	• Stronger position on accommodation for CDI
6	• Recommendation for an antibiotic stewardship program
6	• Further clarification of hand hygiene practice for care of clients/ patients/ residents with *C. difficile*
7-9	• Enhanced cleaning practices for *C. difficile* rooms and bathrooms
9	• Treatment with fidaxomicin
10	• New and evolving therapies
11	• Clarification of discontinuation of precautions for CDI
11	• Additional direction for relapse of symptoms
12	• Antibiotic stewardship
14	• Availability and turnaround time for *C. difficile* testing
14	• Molecular testing recommended as method of choice for *C. difficile* testing
14-16	• Clarification of case definition
16	• Clarification of criteria for investigating *C. difficile* clusters
17	• Clarification of outbreak identification
18	• Additional information about Infection Control Resource Teams (IRCT)
18	• Additional language around CDI outbreaks
20	• Additional recommendation regarding reporting gastrointestinal outbreaks
27	• New Appendix B – CDI Rates in Ontario
28	• New Appendix C – CDI Room Cleaning
31	• Revisions to Appendix D – Patient Information Sheets
35	• New Appendix E – Elements of CDI Line Listing

Table of Contents

Additional Abbreviations for this Annex

Refer to abbreviations in '*Routine Practices and Additional Precautions in All Health Care Settings*' for additional abbreviations found in this annex.

CDI *Clostridium difficile* Infection

EIA Enzyme Immunoassay

PCR Polymerase Chain Reaction

Glossary of Additional Terms for this Annex

Refer to glossary in '*Routine Practices and Additional Precautions in All Health Care Settings*' for additional terms found in this annex.

Case Finding: A standard procedure in the control of certain contagious diseases whereby diligent efforts are made to identify people who are or may be infected.

Cluster: A grouping of cases of a disease within a specific time frame and geographic location suggesting a possible association between the cases with respect to transmission.

Outbreak: For the purposes of this document, an outbreak is an increase in the number of cases above the number normally occurring in a particular health care setting over a defined period of time.

Small Community Hospital: Small community hospitals are defined according to the guidelines set by the Joint Policy and Planning Committee (JPPC). In general, these hospitals are a single community provider, and the total inpatient acute, complex continuing care and day surgery weighted cases are under 2,700, based on 2005-2006 data. (Source: Hospital Report 2007: Acute Care, p. 7<http://www.hospitalreport.ca/downloads/2007/AC/acute_report_2007.pdf>)

Preamble

About This Annex

This annex is added as an extension to PIDAC's *Routine Practices and Additional Precautions in All Health Care Settings* and deals with the prevention and control of transmission of *Clostridium difficile* (*C. difficile*) in acute and non-acute health care settings across the continuum of care including, but not limited to, acute care, long-term care, chronic (including mental health) care and home health care. This annex does not address province-wide surveillance and reporting of *C. difficile* infection (CDI). Each facility should develop a plan for the prevention and control of CDI.

This annex sets out the specific infection prevention and control practices to:

- prevent the transmission of CDI to other patients
- assist health care providers to promptly identify clusters of CDI
- assist health care providers in the management of patients with CDI and outbreaks related to CDI.

➢ More information regarding the infection prevention and control management of clients/ patients/ residents with *C. difficile* infection is detailed in PIDAC's *Routine Practices and Additional Precautions in All Health Care Settings*,[1] available at: http://www.oahpp.ca/resources/pidac-knowledge/best-practice-manuals/routine-practices-and-additional-precautions.html.

Background

A. What are *Clostridium difficile* (*C. difficile*) and *Clostridium difficile* Infection (CDI)?

Clostridium difficile is a Gram-positive, spore-forming, anaerobic bacillus. It is widely distributed in the environment and colonizes up to 3-5% of adults without causing symptoms.[2] Some strains can produce two toxins that are responsible for diarrhea: toxin A and toxin B.

C. difficile produces spores that are resistant to destruction by many environmental interventions, including a number of chemicals. Spread of *C. difficile* occurs due to inadequate hand hygiene and environmental cleaning; therefore, consistent hand hygiene and thorough cleaning of the client/ patient/ resident environment are necessary for control.[3-6]

C. difficile has been a known cause of health care-associated (*nosocomial*) diarrhea for over 30 years. Reported rates of CDI range from 1 to 10 cases per 1000 discharges and 17 to 60 cases per 100, 000 bed-days.[7] *C. difficile* can cause asymptomatic infections or may result in severe, life-threatening disease.[8-11] It can be acquired in both health care and community settings.

There has been an increase in the rates of *C. difficile* infection (CDI) across Canada.[8, 12-14] Outbreaks in Quebec and other areas have been associated with a hypervirulent epidemic strain of *C. difficile*, referred to as the NAP1/BI/027 strain.[15-17] Characteristics of this strain include the presence of a binary toxin; increased resistance to clindamycin and the fluoroquinolone class of antibiotics; and the increased potential for severe adverse events.[15, 18] The NAP1/BI/027 strain has been associated with outbreaks in Europe,[19, 20] the United States[17, 19] and Canada[11, 19, 21] and is responsible for a large proportion of CDI in Ontario. However, **although this strain of *C. difficile* causes more severe disease, the infection prevention and control practices for this strain are the same as for other strains of *C. difficile***.[22]

The increase in CDI has resulted in significant additional costs to the health care system. In a 2006 study in U.S. hospitals it was estimated that each case of CDI in a hospital was associated with USD $3,699.00 in excess health care costs and 3.6 extra days of hospitalization.[12] In 2008, Dubberke calculated an attributable cost for each CDI episode to range from USD $2,454 to $3,240.[23] The cost of CDI readmissions alone is estimated to be a minimum of CAD $128,200 per year per hospital.[8]

Mandatory public reporting of nosocomial CDI began in public hospitals in Ontario in September, 2008. Initially, there was a reduction in CDI rates after the introduction of mandatory reporting.[24] The most current data, however, shows that rates of CDI associated with reporting facilities have increased 13%, from 0.30 per 1000 patient days in 2009 to 0.34 per 1000 patient days in 2011. Higher rates of CDI were observed in Acute Teaching and Large Community Hospitals. This is likely due to a larger proportion of at-risk patients and the increased complexity of care provided in these hospital types. Over the 3-year period, a 55% increase in the number of CDI cases associated with non-health care facilities or unknown sources was also observed (Appendix B).

From January 1, 2009 to December 31, 2011, Public Health Ontario Laboratories - Toronto, which performs reference laboratory testing for Ontario, identified 770 positive *C. difficile* specimens from 71 of the 75 outbreaks. The number of strains (i.e. pulsed field gel electrophoresis patterns) identified per outbreak ranged from 1 to 41, with a median of 3 distinct strains. The NAP1 strain represented 60% (463/770) of all *C. difficile* outbreak strains identified. All isolates were susceptible to metronizadole and vancomycin.[25]

B. Risk Factors for CDI

Factors associated with CDI include:

- a history of antibiotic usage, particularly fluoroquinolones[4, 26, 27]
- immunosuppressive therapy post-transplant[28-30]
- proton pump inhibitors[31-33]
- bowel disease and bowel surgery[34]
- chemotherapy[35]
- hospitalization.

Additional risk factors that predispose some people to develop more severe disease include:[9]

- history of CDI[36]
- increased age[15, 19]
- immunosuppressive therapy[37]
- recent surgery[36]
- CDI with the hypervirulent strain of *C. difficile*.[15]

Prevention and Control Measures for CDI

There are two major components to successful control of CDI – effective infection prevention and control (IPAC) measures and antibiotic stewardship.

A. IPAC Measures

Sustained control of CDI may be achieved with infection prevention and control measures directed at interrupting the horizontal spread of *C. difficile*.[4, 5] CDI prevention and control requires:

- a system for identification and prompt isolation of suspected or known CDI cases
- appropriate environmental services policies and procedures for CDI cases, including use of sporicides
- a hand hygiene program
- a system for disposal of faeces that prevents environmental contamination
- access to appropriate and timely laboratory testing.

1. Initiation of Contact Precautions

In addition to Routine Practices, Contact Precautions should be initiated by any regulated health care provider (e.g., physician, nurse) at onset of diarrhea and prior to receipt of *C. difficile* test results.

Contact Precautions should also be initiated when:

- there is a suspected or confirmed case of CDI
- there is toxic megacolon or pseudomembranous colitis.

While the majority of patients with CDI have diarrhea, some cases of CDI may present with isolated elevations in white blood cell count and ileus.[34]

Discontinuation of precautions should only be done under the direction of Infection Prevention and Control.

- Refer to PIDAC's *Routine Practices and Additional Precautions in All Health Care Settings* for more information regarding Contact Precautions. Available at: http://www.oahpp.ca/resources/pidac-knowledge/best-practice-manuals/routine-practices-and-additional-precautions.html.

2. Accommodation

Decision-making regarding accommodation for patients/ residents with CDI is based on the mode of transmission of *C. difficile* (i.e., contact spread of *C. difficile* spores) and the patient/ resident's condition (e.g., faecally incontinent individuals are more likely to contaminate the environment with *C. difficile*).

The following are general guidelines for placement of patients/ residents suspected of having, or confirmed with, CDI:

- All patients/ residents with CDI should remain in their room or bed space while symptomatic with CDI.
- **Acute Care, Complex Continuing Care, Rehabilitative Medicine**
  - A single room with dedicated toileting facilities (i.e., private bathroom or individual commode chair) is strongly recommended.
  - Terminal cleaning of the patient's previous bed space and bathroom with a sporicide should be done on transfer to the single room.
  - If single rooms are limited, patients who are faecally incontinent and soiling the environment should have priority for those rooms.[22]
  - If a single room is not available, placement should be assessed by Infection Prevention and Control and the patient care team. For cohorting purposes, laboratory-confirmed CDI cases should only share a room with other laboratory-confirmed CDI cases.[22]
- **Long-Term Care Homes**
  - A single room with dedicated toileting facilities (i.e., private bathroom or individual commode chair) is preferred; this may require limiting a shared bathroom to one resident.
  - In a multi-bed room:
    - Display visible signage indicating the precautions to be used.
    - Maintain physical separation and draw privacy curtain between residents to promote separation of items.[19, 22]
    - Provide an easily accessible PPE supply cart.
    - Place a laundry hamper as close to the resident's bed space as possible.
    - Dedicate a commode chair and other personal care items for the resident's use.[19]

3. Hand Hygiene

Soap and water are theoretically more effective at removing spores than ABHR. However, the use of gloves for care of clients/ patients/ residents with CDI minimizes hand contamination and has been shown to reduce transmission of *C. difficile*.[38]

Effective hand hygiene is essential to limit the spread of *C. difficile*:[19]

- Observe meticulous hand hygiene with either alcohol-based hand rub (ABHR) or soap and water.
- When a dedicated staff hand washing sink is immediately available, hands should be washed with soap and water after glove removal.
- When a dedicated staff hand washing sink is not immediately available, hands should be cleaned using ABHR, after glove removal.
- Hand hygiene should not be carried out at a patient sink as this will re-contaminate the health care *provider*'s hands.
- Education should be provided to the client/ patient/ resident on the need and procedure to be used for hand hygiene. Clients/ patients/ residents who are unable to perform hand hygiene independently should be assisted by the health care provider.

4. Environmental Cleaning

C. difficile is a spore-forming bacterium which is readily killed in the vegetative form with hospital-grade disinfectants, but the spores can persist in the environment for months. The spores can be spread by contact and germinate once ingested. Specialized cleaning and disinfection practices are required for *C. difficile*. *C. difficile* control is facilitated through thorough cleaning and disinfection of the client/ patient/ resident environment to remove and kill the spores.

Effective cleaning of the environment around clients/ patients/ residents who have CDI is essential in limiting the acquisition and spread of *C. difficile*.[4, 5, 13]

- Refer to PIDAC's *Best Practices for Environmental Cleaning for Prevention and Control of Infections in All Health Care Settings* for information and checklists on environmental cleaning for *C. difficile*, available at: http://www.oahpp.ca/resources/pidac-knowledge/best-practice-manuals/environmental-cleaning-for-prevention-and-control-of-infections.html.

For adequate control of *C. difficile*, a sporicide should be used (**BOX 1**):

- for daily cleaning of CDI patient/ resident bathrooms
- for disinfection after the room has been cleaned for each CDI patient discharged or transferred to another room, including transfer to initiate Contact Precautions
- prior to discontinuing Contact Precautions.

The following sporicides have shown activity against *C. difficile* spores:

- sodium hypochlorite (1,000 - 5,000 parts per million)[39-41] for 10 to 30 minutes (dependent on concentration)
- hydrogen peroxide enhanced action formulation (4.5%)[42] for 10 minutes
- peracetic acid (0.26%)[43] for 5 minutes.

BOX 1: Recommended Uses for Sporicides

Use a sporicide for:

- routine cleaning of CDI patient/ resident bathroom
- discharge/ transfer cleaning of patient/ resident room and bathroom when CDI is suspected and the patient/ resident is being transferred to a single room to initiate Contact Precautions
- discharge/ transfer cleaning of CDI patient/ resident room prior to discontinuing Contact Precautions
- cleaning all equipment and high-touch surfaces on a unit with multiple cases of CDI
- routine cleaning of bathrooms in ambulatory areas where CDI patients are often seen (e.g., emergency department, chemotherapy clinic)

Environmental contamination with *C. difficile* is most concentrated in patients'/ residents' rooms and particularly bathrooms,[16] making these areas the focus of stringent cleaning methods. It has recently been shown that *C. difficile* may be eliminated from the environment with good mechanical cleaning action (friction) without a sporicide; [44] however, it has also been shown that less than 50% of room surfaces are adequately cleaned in this way.[45]

Specific recommendations for cleaning may be found in Appendix C. These include:[19]

- Clean and disinfect patient/ resident room twice daily using a hospital-grade disinfectant or a sporicide.
- Clean and disinfect patient/ resident bathroom twice daily using a sporicidal agent.
- Discharge/ transfer cleaning should be double cleaning.
- If using a QUAT for cleaning, thorough rinsing before applying a hydrogen peroxide enhanced action formulation agent is required.

Because of the potentially high bioburden of CDI spores, if there are multiple cases of CDI on a unit/ ward, regardless of whether they are all attributable to the unit/ ward (e.g., transfer from other units/ wards, CDI admissions from the community, or relapsed cases):

- When each patient/ resident is discharged or transferred, consider cleaning and disinfecting their bed/bed space and bathroom with a sporicide, regardless of the patient/ resident's CDI status.
- Clean and disinfect all high-touch surfaces on the unit with a sporicide.
- Clean and disinfect all patient care equipment on the unit with a sporicide.

Consider making the routine disinfecting agent for bathrooms a sporicide in ambulatory areas with high turnover where patients with CDI are likely to be seen (e.g., emergency department, chemotherapy clinic). At a minimum, these high-use bathrooms should be cleaned every four hours.

5. Other Interventions to Limit *C. difficile* Transmission

The following interventions are also important in minimizing the transmission of *C. difficile*:

- Client/ patient/ resident temperature should not be taken rectally; rectal thermometers have been linked with the spread of CDI.[46]
- Commodes and bedpans must be handled very carefully to reduce spread of contamination with *C. difficile* spores from the commode/ bedpan to the environment:
  - Commode chair must be dedicated to the patient/ resident.
  - Commode is cleaned and disinfected with a sporicide whenever the room/ bathroom is cleaned.
  - When precautions are discontinued, commodes and bedpans are cleaned and disinfected with a sporicide before use with another patient/ resident.
  - If bedpans are used, it is strongly recommended they be disposable.
  - **Bedpan cleaning wands or toilet taps should not be used**.

- Items used to clean the bathroom of a patient/ resident with CDI must be cleaned and disinfected before use in another patient/ resident room.[47]
- Toilet brushes/ swabs used in CDI bathrooms must be dedicated to that patient bathroom and discarded once Contact Precautions are discontinued.

- Effective waste management is an important consideration. Several industrial options that prevent cross-contamination include bedpan-washer units, macerators for disposable waste products and hygienic bags. The feasibility of using these alternatives should be explored by the facility; management choice will be dependent on local conditions.

6. Treatment of *C. difficile*

Do not treat symptom-free carriers of *C. difficile*.[2, 46]

Components of treatment should include:

- **cessation of antibiotic therapy if possible;** if this is not possible, consultation with an infectious diseases physician should be considered
- rehydration of the client/ patient/ resident
- avoidance of antimotility agents, such as loperamide

Antibiotic therapy for CDI:

- Recommended 1st line therapy for mild to moderate CDI:[48, 49]
  - metronidazole 500 mg orally every 8 hours for 10 to 14 days
- Recommended 1st line therapy for initial episode of severe CDI*:[48, 49]
  - vancomycin 125 - 250 mg orally every 6 hours for 10 to 14 days

  *Severe CDI is defined as either the presence of pseudomembranous colitis on endoscopy, **or** CDI infection requiring treatment in an intensive care unit, **or** the presence of at least two of: age >60 years, temperature >38.5°C, white blood cell count >15 x 10^9 cells per litre (15,000 per mm^3).
  - If outpatient therapy with oral vancomycin is being considered, discuss with pharmacy to ensure that treatment will not be interrupted.
  - Use vancomycin also if:
    - metronidazole is ineffective
    - the patient is allergic to metronidazole
    - true resistance to metronidazole is shown
- Fidaxomicin is a macrocyclic antibiotic recently available for treatment of CDI. It is non-inferior to vancomycin for curing CDI and is superior for reducing CDI recurrences.[50] Reduced recurrences may be due to the relative preservation of the bowel microbial flora[51] and/ or by inhibition of spore production by fidaxomicin.[52] Fidaxomicin is similar to vancomycin in response to treatment of a first recurrence of CDI, but superior in preventing a further recurrence.[53] Fidaxomicin is more expensive than vancomycin for a treatment course for CDI.
- Clients/ patients/ residents who responded to initial therapy but developed relapse may be retreated with the same agent used to treat the initial episode of CDI.
- For clients/ patients/ residents with multiple recurrences or refractory disease, despite appropriate treatment, there should be consultation with a physician knowledgeable in the treatment of CDI (e.g., infectious disease physician, gastroenterologist, general surgeon, medical microbiologist).
- Monitor client/ patient/ resident throughout the course of treatment for signs and symptoms of complications such as peritonitis, dehydration or electrolyte abnormalities.

New and evolving therapies:

New prevention and treatment modalities are being explored to modify or treat *C. difficile*, including:

- **Probiotics for preventing *C. difficile*:** Naturally-occurring, live microorganisms that are administered to confer a health benefit to a host. The rationale for their use in preventing CDI in patients taking antibiotics is based on the hypothesis that they would restore equilibrium to the gastrointestinal flora that have been altered by the antimicrobial exposure and thus protect against colonization or overgrowth with *C. difficile.* Recent meta-analyses showed moderate-quality evidence that probiotics are associated with a reduction in antibiotic-associated diarrhea and CDI.[54-56] Their use in patients with chronic gastrointestinal disease, recent bowel surgery or severe immunosuppression is not recommended. Further study is warranted.
- **Faecal microbiota transplantation for treatment of *C. difficile*:** Involves using a solution of human faeces and saline to re-grow healthy bacteria in the intestinal tract of an individual with CDI that has not responded to traditional therapy. The process involves obtaining donor faeces from a close contact or standard donor, and transplanting it into the ill individual via nasogastric tube or colonoscope.[22, 57] Although data are limited, faecal transplantation has been used successfully to treat relapsing CDI.[57-60]

7. Visitors

Visitors should receive instruction on the importance and proper technique for hand hygiene. Visitors who provide care for a patient/ resident, or who have significant contact with the patient/ resident's immediate environment, should follow the same precautions as health care providers. Visitors must not use the patient/ resident's bathroom or go into other patient/ resident rooms or bed spaces. Visitors should be discouraged from eating or drinking in the room or bed space.

8. Patient Transfer

Suspected or confirmed CDI patients/ residents should only be transferred within the health care system when medically appropriate. Medically-appropriate transfer is dependent on the receiving unit/ department or facility's ability to comply with requirements for accommodation. Prior to transport, Transportation Services, the receiving unit/ department or facility and Infection Prevention and Control must be notified that a patient/ resident with CDI is being transferred.

9. Patient Discharge

After discharge, patients with CDI are not a risk for other family members, as person-to-person transmission within the home setting is rare. Good hand hygiene practices should always be exercised by the discharged patient and household members. Patients and their families should be instructed to clean their bathroom thoroughly using regular household cleaners. Educational tools for patients and family regarding proper hand hygiene and potential for CDI relapse should be considered.

- Refer to Appendix D for sample patient education fact sheets.

10. Discontinuation of Precautions for CDI

Precautions for CDI should only be discontinued in consultation with Infection Prevention and Control. The following criteria are used when considering discontinuing precautions for CDI:

- **Patient/ resident with suspected CDI:**
  - Patients/ residents on Contact Precautions for suspected CDI may, after consultation with Infection Prevention and Control, have the precautions discontinued when two negative EIA toxin tests or one negative molecular test have been reported.
  - If CDI is still suspected, the clinician should evaluate the patient/ resident and consider other diagnostic modalities (e.g., colonoscopy/ sigmoidoscopy). Contact Precautions should be maintained until such evaluation has taken place or until CDI is otherwise ruled out.
- **Patient/ resident with confirmed CDI:**
  - Contact Precautions may be discontinued when the patient/ resident has had at least 48 hours without diarrhea (e.g., formed or normal stool for the individual).
  - Contact Precautions should be discontinued only in consultation with Infection Prevention and Control.
  - Re-testing for *C. difficile* is not necessary and is not recommended to determine when precautions may be discontinued.
  - Contact Precautions should not be discontinued until the room/ bed space and bathroom have received terminal CDI cleaning with a sporicide.

11. Relapse of Symptoms

Relapse refers to the recurrence of the symptoms of CDI after a symptom-free period. With CDI, cases should be counted as a relapse if symptoms recur within two months of the last infection. Relapse of CDI is common and occurs in about 30% of cases. In patients who have recently had CDI, there should be a clear indication for re-starting antibiotics for other suspected infectious processes, due to the high risk of relapse. If diarrhea recurs:

- Place patient/ resident on Contact Precautions immediately.
- Re-test for *C. difficile*.
- Consider leaving the patient/ resident in a single room even after resolution of symptoms.

12. Occupational Health

Health care providers, even when they are taking antibiotics, are not at risk of acquiring CDI occupationally if they follow Routine Practices, including hand hygiene, for all client/ patient/ resident interactions, and use Contact Precautions when caring for patients with CDI. Staff must not consume food or beverages in patient/ resident care areas.[61]

B. Antibiotic Stewardship

An antibiotic stewardship program (ASP) is an essential component of prevention and control with *C. difficile*. In addition, discontinuing antibiotics (except metronidazole or oral vancomycin initiated as

treatment for CDI) as soon as the patient's condition permits is an important aspect of CDI control.[2, 7,46, 62]

- Refer to Public Health Ontario's website for information on developing an ASP program in your facility: http://www.oahpp.ca/services/antimicrobial-stewardship-program.html.

- Refer to PIDAC's *Annex A, Screening, Testing and Surveillance for Antibiotic-Resistant Organisms (AROs) in All Health Care Settings*,[63] for more information about antibiotic stewardship programs. Available at: http://www.oahpp.ca/resources/pidac-knowledge/best-practice-manuals/screening-testing-and-surveillance-for-antibiotic-resistant-organisms-aros.html.

Recommendations:

1. ***Each health care facility should implement a program for prevention and control of C. difficile that includes:***
   a) ***a system for identification and prompt isolation of CDI cases; [AII]***
   b) ***appropriate Environmental Services policies and procedures for CDI cases, including use of sporicides; [AII]***
   c) ***a hand hygiene program; [AII]***
   d) ***access to appropriate and timely laboratory testing; [AIII] and***
   e) ***an antibiotic stewardship program. [A1]***
2. ***Initiate Contact Precautions: [AII]***
   a) ***at onset of diarrhea and prior to receipt of C. difficile test results;***
   b) ***when there is a suspected or confirmed case of CDI; or***
   c) ***when there is toxic megacolon or pseudomembranous colitis.***
3. ***Discontinuation of Contact Precautions:***
   a) ***Discontinue Contact Precautions only in consultation with Infection Prevention and Control. [BIII]***
   b) ***For suspected CDI, the need for Contact Precautions may be reassessed when two negative EIA toxin tests or one negative molecular test have been reported. [AII]***
   c) ***For confirmed CDI cases:***
      i. ***Discontinue precautions when the patient/ resident has had at least 48 hours without diarrhea. [BIII]***
      ii. ***Re-testing for C. difficile is not necessary and is not recommended to determine when precautions may be discontinued. [AI]***
      iii. ***Do not discontinue Contact Precautions until the room/ bed space has been cleaned with a sporicide. [AII]***
4. ***Contact Precautions for C. difficile should include: [AI]***
   a) ***single room accommodation with dedicated toileting facilities ,***

      OR

   b) ***dedicated commode chair if single bathroom is not available;***

      AND

c) *dedicated patient care equipment.*

5. *Clean the patient's previous bed space and bathroom with a sporicide on transfer to a single room for Contact Precautions. [AII]*
6. *Routine patient/ resident room cleaning for CDI includes: [AIII]*
   a) *twice daily cleaning and disinfection using a hospital-grade disinfectant or a sporicide; and*
   b) *twice daily cleaning and disinfection of patient/ resident bathroom using a sporicide.*
7. *Discharge/ terminal cleaning of patient/ resident room for CDI Includes: [AIII]*
   a) *cleaning and disinfection of all surfaces using a hospital-grade cleaner and a sporicide disinfectant*
   b) *double cleaning of patient/ resident room and bathroom*
8. *For patients/ residents with CDI or suspected CDI:*
   a) *Do not use rectal thermometers. [AI]*
   b) *Handling and disposal of stool should employ methods that minimize transmission of C. difficile spores: [AII]*
      i. *Do not use cleaning wands to clean bedpans/ commode pans.*
      ii. *If bedpans are needed, use a disposable product.*
      iii. *Dedicate toilet brushes/ swabs in bathroom. Discard when Contact Precautions is discontinued or the patient/ resident is transferred.*
9. *Each facility should have an antibiotic stewardship program in place.*

CDI Testing and Surveillance

A. Testing for Diagnosis of *C. difficile* Infection

Cultures for *C. difficile* are not routinely done. Laboratory testing for CDI usually involves detection of the cytotoxin(s) (A and B) produced by *C. difficile* by enzyme immunoassay (EIA) toxin or detection of the *C. difficile* toxin gene by molecular methods such as polymerase chain reaction (PCR):

- Stool sample collection should occur as soon as possible after the onset of diarrhea.
- Rapid turnaround time for *C. difficile* testing and reporting is essential and should be pre-arranged with the microbiology laboratory serving the health care setting. Ideally, turnaround time should be less than 24 hours and the test should be available seven days per week.
- All positive *C. difficile* tests should be reported as soon as possible to Infection Prevention and Control at the facility where the test sample originated.
- For suspect cases, a single negative toxin test by EIA does not rule out *C. difficile;* if a single test is negative, a second specimen should be sent.
- Testing by molecular methods such as PCR is more sensitive[64] and if the first test is negative, a second test is not necessary. Some laboratories employ a two-step method, with detection of *C. difficile* glutamate dehydrogenase antigen (GDH) followed by a molecular test if GDH is positive. Molecular testing is now considered the testing method of choice.[65, 66]
- Testing for *C. difficile* may be repeated if the clinical status deteriorates or to diagnose a relapse of CDI following a period of absence of symptoms.
- Re-testing as a test of cure is not indicated; toxin may persist in stool for weeks and therefore is not helpful in determining duration of treatment or the discontinuation of Additional Precautions.
- Testing for *C. difficile* should not be carried out on formed stools.
- Testing for *C. difficile* should not be done in children under the age of one year, as the presence of *C. difficile* in stool is normal in this age group.[46, 67]
- Testing can detect *C. difficile* colonization or disease. Results of laboratory testing must be correlated with the clinical condition of the client/ patient/ resident. If the client/ patient/ resident does not meet the case definition for CDI, he/she should not be counted as a case of CDI (see BOX 2 for case definition).

B. Case Definitions for Surveillance and Reporting

1. Case Definition for CDI

Each facility should establish a mechanism for counting and keeping track of the number of confirmed cases of CDI acquired within the facility according to a standardized case definition (BOX 2) and should maintain a summary record. Infection Prevention and Control should review and analyze these data on an ongoing basis to identify any clusters. This record should be submitted as a report to the Infection Prevention and Control Committee and facility administration on a regular basis.

BOX 2: Case Definition of *Clostridium difficile* Infection (CDI)

a) Laboratory confirmation of *C. difficile* together with diarrhea*****

OR

b) Visualization of pseudomembranes on sigmoidoscopy or colonoscopy

OR

c) Histological/ pathological diagnosis of pseudomembranous colitis

OR

d) Diagnosis of toxic megacolon

*****Diarrhea is defined as:

- loose/ watery stool (i.e., if the stool were to be poured into a container, it would conform to the shape of the container)

  AND

- the bowel movements are unusual or different for the client/ patient/ resident

  AND

- there is no other recognized aetiology for the diarrhea (e.g., laxative use)

* For the purpose of defining a case of CDI, there should be three or more episodes of diarrhea within a 24-hour period. Contact Precautions should be initiated at onset of diarrhea, without waiting for further episodes.

2. Surveillance Definition for Attributable CDI

Surveillance definitions may differ between jurisdictions. It is important to note that the time frames associated with these definitions, while useful for surveillance purposes, are arbitrary and may not truly reflect *C. difficile* acquisition in the facility.[68]

The following definitions should be used to determine whether a health care-acquired case of CDI is attributable to your facility. It should be noted that these definitions are internal surveillance definitions and may differ from those for definitions that need to be followed for mandatory reporting:

- **CDI Attributable to Your Facility:**
  The symptoms of CDI were not present on admission (i.e., onset of symptoms > 72 hours after admission) or the infection is present at the time of admission but is related to a previous admission to your facility within the last four weeks.

- **CDI Not Attributable to Your Facility:**
  The symptoms of CDI were present on admission or < 72 hours after admission and there was no admission to your facility within the last four weeks
  OR
  The symptoms of CDI recur within two months of the last infection (relapse).

Rates of CDI are best expressed as:

- the number of new cases per 1000 patient days; and/ or
- the number of new cases per 1000 patient admissions.

Clusters of cases attributable to one area should be investigated. CDI rates in excess of the facility's baseline rate over two consecutive months should also be investigated.

In Ontario, CDI infection rates are a mandatory patient safety indicator, reportable to the Ministry of Health and Long-Term Care (MOHLTC) monthly.

Recommendations:

10. ***Tests for C. difficile should have a target turnaround time less than 24 hours and be available seven days per week. [BIII]***
11. ***The testing method of choice for C. difficile is a molecular method, such as PCR (polymerase chain reaction). [AI]***
12. ***C. difficile testing: [AI]***
    a) ***should not be done as a test of cure;***
    b) ***should not be done on children under the age of one year; and***
    c) ***should not be done on formed stools.***
13. ***All positive C. difficile tests should be reported as soon as possible to the originating unit and to Infection Prevention and Control. [BIII]***
14. ***Each health care facility should establish a mechanism for counting and keeping track of the number of confirmed cases of CDI acquired within the facility, using a standardized case definition for CDI. This is a mandatory requirement for hospitals in Ontario.***
15. ***Clusters of CDI cases attributable to one unit or area or CDI rates in excess of the facility's baseline rates should be investigated.***

CDI Outbreaks

Cases of CDI occurring at a rate exceeding the normally expected baseline rate for the health care setting (or unit, floor, ward) during a specified period of time should be investigated as a possible outbreak. The definition of an outbreak of CDI will depend on the endemic (or baseline) rate for the health care setting. Health care facilities need to consider their endemic or baseline rate as compared to their peer hospitals and other hospitals in their region.

Since September 1, 2008 all hospitals in Ontario have been required to report suspected or confirmed CDI outbreaks and outbreak-associated cases to the local medical officer of health (MOH) under the *Health Protection and Promotion Act (HPPA)*:

- O. Reg. 558/91[69] includes CDI outbreaks in public hospitals on the list of communicable diseases in Ontario.
- O. Reg. 559/91[70] includes outbreaks of CDI in public hospitals on the list of reportable diseases in Ontario.
- Regulation 569[71] includes the specific data elements for outbreaks of CDI which hospitals must provide to their local public health unit.

The principles of CDI outbreak management also apply to other facilities, such as long-term care and retirement homes. CDI outbreaks should also be reported by long-term care homes, as CDI outbreaks are institutional outbreaks of gastroenteritis.

A. Identifying a CDI Outbreak

CDI outbreak definitions incorporate the concept of notification thresholds that optimally trigger action and dialogue between the local public health unit and the facility to determine if an outbreak is occurring.

Facilities should use the following CDI notification thresholds to assist them in determining the need for consultation with their local public health unit. Facilities with limited experience in managing CDI should consult with the local public health unit and/or with the local regional infection control network. These thresholds were developed by the MOHLTC.

Notification thresholds are defined as:

For wards/units with ≥20 beds, three (3) new cases of nosocomial CDI identified on one ward/unit within a seven-day period OR five (5) new cases of nosocomial CDI within a four-week period,

OR

For wards/units with <20 beds, two (2) new cases of nosocomial CDI identified on one ward/unit within a seven-day period OR four (4) new cases of nosocomial CDI within a four-week period,

OR

Facilities that have a facility nosocomial CDI rate that exceeds their annual nosocomial baseline rate for a period of two consecutive months. NOTE: This is not valid for a small community hospital (*see Glossary*), where a single case of nosocomial CDI can artificially elevate the facility rate.

It should be noted that exceeding a threshold does not necessarily imply that an outbreak will be declared.

1. CDI Outbreak Thresholds

Following consultation between the facility and the local public health unit, decisions on the declaration of an outbreak will be made based on the following criteria:

- There has been a significant* (as determined by the facility and the local public health unit) increase in CDI numbers or rate compared to own baseline and/or that of comparator facilities.
- Recognized control measures are in place and are being used.
- There is epidemiologic evidence of ongoing nosocomial transmission on the ward/unit or facility.

*Significance may be determined by reviewing:

- number of new nosocomial cases associated with the reporting ward/unit or facility
- historic level of CDI activity of the ward/unit or facility
- current trend in ward/unit CDI activity or facility rate
- location of current cases and possible epidemiologic links between cases

Declaration of an outbreak can be made by either the facility or the MOH. In the event of a disagreement between the facility and the MOH regarding the declaration of an outbreak, the MOH has the authority to determine if an outbreak of a communicable disease exists, for purposes of exercising statutory powers under the *Health Protection and Promotion Act* [Section 29.2(2)]. Once an outbreak is declared it is reported to Public Health Ontario through the integrated Public Health Information System (iPHIS).

An Infection Control Resource Team (ICRT) visit may be requested by the facility and/or the MOH at any time during threshold investigation or outbreak management.

- For more information about ICRTs, see the Public Health Ontario website: http://www.oahpp.ca/services/infectious-disease-prevention-and-control.html
- To contact PHO regarding an ICRT, Email: icrt@oahpp.ca

2. Assessment of a CDI Outbreak

Once an increase in the number of expected cases of CDI has been detected, surveillance measures should be reviewed to ensure early detection of new CDI cases.

All reviewed cases should be based on the provincial definition. A line listing should be started and discussion with the local public health unit considered once any of the criteria for a threshold has been met. All patients with unexplained diarrhea are recorded on the line listing and appropriate specimens should be obtained for CDI testing; patients should be removed from the line listing if CDI is not confirmed. A sample line listing may be found in Appendix E.

B. Outbreak Management

1. Infection Prevention and Control Measures in Outbreaks

Once an outbreak has been declared, an Outbreak Management Team should be convened (see PIDAC's *Best Practices for Infection Prevention and Control Programs in Ontario*, available at: http://www.oahpp.ca/resources/pidac-knowledge/best-practice-manuals/infection-prevention-and-control-programs-in-ontario.html).

In addition to the recommended management of patients/ residents with CDI, the following measures should be implemented:

- Reinforce implementation of Contact Precautions as soon as possible for all patients/ residents at onset of unexplained diarrhea.
- Dedicate equipment to patients/ residents with CDI.
- Clean entire unit with a sporicidal disinfectant, including patient care equipment, high-touch items at nursing stations, carts (medication, isolation) and other areas touched by health care providers.
- Audit compliance with hand hygiene, Routine Practices, Additional Precautions and environmental cleaning.

The decision to close the unit to admissions should take into consideration:

- burden of CDI on the unit at the time of the outbreak
- ability to cohort patients/residents.

If closure is deemed necessary but is unable to be implemented, the facility may consider triaging patients/ residents admitted to the outbreak unit to ensure those at highest risk (i.e., patients/ residents receiving antibiotic therapy for long duration, immunocompromised) are not admitted to that unit.

2. Antibiotic Stewardship in an Outbreak

In an outbreak, ASP considerations include:

- Review antibiotic use on the outbreak unit.
- Discuss potential opportunities for decreasing antibiotic use with the ASP program and attending physicians.

3. Declaring an Outbreak Over

The criteria for declaring an outbreak over should be determined collaboratively by the facility and the local public health unit as part of the outbreak management team process.

Factors to consider in declaring an outbreak over should include:

- Control measures have been implemented and validated through an audit process.
- There has been a return to unit/ ward or facility baseline for nosocomial CDI. For a facility-wide outbreak, this should be a minimum period of one month.
- Reservoir of colonized patients/ residents in the facility has been discharged.
- Facility's past experience with CDI outbreaks demonstrates ability to bring them under control.

Recommendations:

16. ***All hospitals in Ontario shall report suspected or confirmed CDI outbreaks and outbreak-associated cases to the local medical officer of health.***

17. ***All long-term care homes in Ontario should report suspected or confirmed gastrointestinal outbreaks, including CDI outbreaks, to the local medical officer of health.***

Summary of Recommendations for Annex C: Testing, Surveillance and Management of *Clostridium difficile* in All Health Care Settings

This summary table is intended to assist with self-assessment internal to the health care setting for quality improvement purposes. See complete text for rationale.

Recommendation		Compliant	Partial Compliance	Non-compliant	Action Plan	Accountability
Infection Prevention and Control Measures for CDI						
1.	***Each health care facility should implement a program for prevention and control of C. difficile that includes:*** ***a) a system for identification and prompt isolation of CDI cases; [AII]*** ***b) appropriate Environmental Services policies and procedures for CDI cases, including use of sporicides; [AII]*** ***c) a hand hygiene program; [AII]*** ***d) access to appropriate and timely laboratory testing; [AIII] and*** ***e) an antibiotic stewardship program. [A1]***					
2.	***Initiate Contact Precautions: [AII]***					

Recommendation		Compliant	Partial Compliance	Non-compliant	Action Plan	Accountability
	a) at onset of diarrhea and prior to receipt of C. difficile test results; *b) when there is a suspected or confirmed case of CDI; or* *c) when there is toxic megacolon or pseudomembranous colitis.*					
3.	*Discontinuation of Contact Precautions:* *a) Discontinue Contact Precautions only in consultation with Infection Prevention and Control. [BIII]* *b) For suspected CDI, the need for Contact Precautions may be reassessed when two negative EIA toxin tests or one negative molecular test have been reported. [AII]* *c) For confirmed CDI cases:* *i. Discontinue precautions when the patient/ resident has had at least 48 hours without diarrhea. [BIII]* *ii. Re-testing for C. difficile is not necessary and is not recommended to determine when precautions may be discontinued. [AI]* *iii. Do not discontinue Contact Precautions until the room/ bed space has been cleaned with a sporicide. [AII]*					
4.	*Contact Precautions for C. difficile should include: [AI]* *a) single room accommodation with dedicated toileting*					

Recommendation		Compliant	Partial Compliance	Non-compliant	Action Plan	Accountability
	facilities, *OR* *b) dedicated commode chair if single bathroom is not available;* *AND* *c) dedicated patient care equipment.*					
5.	*Clean the patient's previous bed space and bathroom with a sporicide on transfer to a single room for Contact Precautions. [AII]*					
6.	*Routine patient/ resident room cleaning for CDI includes: [AIII]* *a) twice daily cleaning and disinfection using a hospital-grade disinfectant or a sporicide; and* *b) twice daily cleaning and disinfection of patient/ resident bathroom using a sporicide.*					
7.	*Discharge/ terminal cleaning of patient/ resident room for CDI Includes: [AIII]* *a) cleaning and disinfection of all surfaces using a hospital-grade cleaner and a sporicide disinfectant* *b) double cleaning of patient/ resident room and bathroom*					
8.	*For patients/ residents with CDI or suspected CDI:* *a) Do not use rectal thermometers. [AI]*					

Recommendation		Compliant	Partial Compliance	Non-compliant	Action Plan	Accountability
	b) Handling and disposal of stool should employ methods that minimize transmission of C. difficile spores: [AII] *i. Do not use cleaning wands to clean bedpans/ commode pans.* *ii. If bedpans are needed, use a disposable product.* *iii. Dedicate toilet brushes/ swabs in bathroom. Discard when Contact Precautions is discontinued or the patient/ resident is transferred.*					
9.	*Each facility should have an antibiotic stewardship program in place.*					
CDI Testing and Surveillance						
10.	*Tests for C. difficile should have a target turnaround time less than 24 hours and be available seven days per week. [BIII]*					
11.	*The testing method of choice for C. difficile is a molecular method, such as PCR (polymerase chain reaction). [AI]*					
12.	*C. difficile testing: [AI]* *a) should not be done as a test of cure;* *b) should not be done on children under the age of one*					

Recommendation		Compliant	Partial Compliance	Non-compliant	Action Plan	Accountability
	year; and *c) should not be done on formed stools.*					
13.	***All positive C. difficile tests should be reported as soon as possible to the originating unit and to Infection Prevention and Control. [BIII]***					
14.	***Each health care facility should establish a mechanism for counting and keeping track of the number of confirmed cases of CDI acquired within the facility, using a standardized case definition for CDI. This is a mandatory requirement for hospitals in Ontario.***					
13.	***Clusters of CDI cases attributable to one unit or area or CDI rates in excess of the facility's baseline rates should be investigated.***					
CDI Outbreaks						
16.	***All hospitals in Ontario shall report CDI outbreaks and outbreak-associated cases to the local medical officer of health.***					
17.	***All long-term care homes in Ontario should report suspected or confirmed gastrointestinal outbreaks, including CDI outbreaks, to the local medical officer of health.***					

Appendices

Appendix A: Ranking System for Recommendations

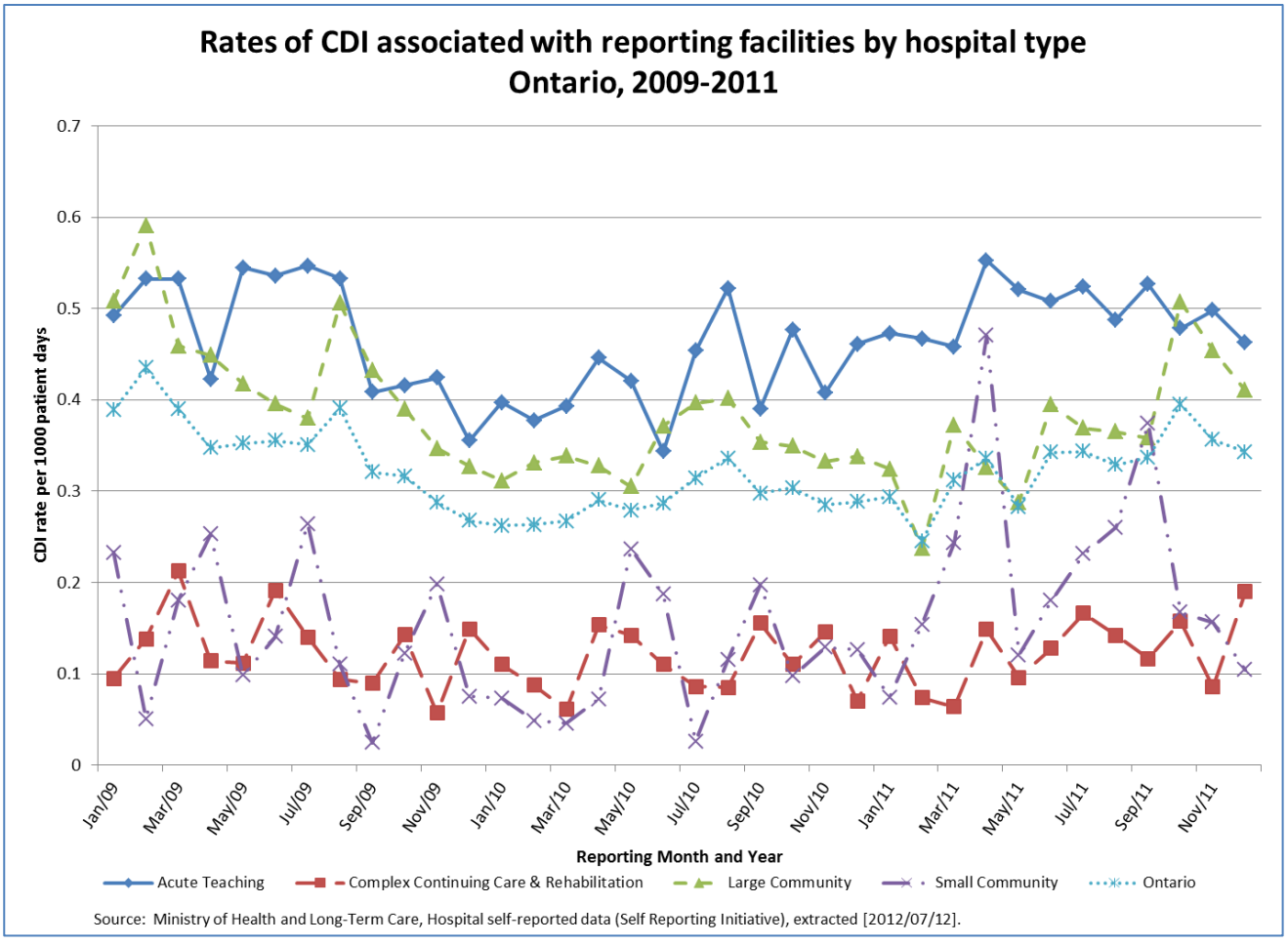
Categories for strength of each recommendation	
CATEGORY	**DEFINITION**
A	Good evidence to support a recommendation for use.
B	Moderate evidence to support a recommendation for use.
C	Insufficient evidence to support a recommendation for or against use
D	Moderate evidence to support a recommendation against use.
E	Good evidence to support a recommendation against use.
Categories for quality of evidence on which recommendations are made	
GRADE	**DEFINITION**
I	Evidence from at least one properly randomized, controlled trial.
II	Evidence from at least one well-designed clinical trial without randomization, from cohort or case-controlled analytic studies, preferably from more than one centre, from multiple time series, or from dramatic results in uncontrolled experiments.
III	Evidence from opinions of respected authorities on the basis of clinical experience, descriptive studies, or reports of expert committees.

NOTE: When a recommendation is based on a regulation, no grading will apply.

Appendix B: CDI Rates in Ontario, 2009 - 2011

Year	No. (%) CDI associated with reporting facility	No. (%) CDI associated with other health care facility	No. (%) CDI associated with non-health care or unknown source	Total	Rate of CDI associated with reporting facilities per 1000 patient days
2009	3098 (59)	773 (15)	1356 (26)	5227	0.30
2010	3004 (57)	747 (14)	1537 (29)	5288	0.30
2011	3472 (53)	934 (14)	2096 (32)	6502	0.34

Source: Ministry of Health and Long-Term Care, Hospital self-reported data (Self Reporting Initiative), extracted [2012/07/12].



Appendix C: Sample Procedure for Cleaning Rooms of Patients/ Residents on Contact Precautions for *C. difficile*

Daily Cleaning – clean twice per day

1. Clean hands using ABHR and put on gloves.
2. Use a fresh bucket and mop head (dust mop and wet mop) for each room.
3. Use fresh cloth(s) for cleaning each patient/ resident bed space or room.
4. Clean and disinfect patient/ resident room using a hospital-grade disinfectant or a sporicide, working from clean to dirty and high to low areas of the room:
   - If using a QUAT for cleaning, thoroughly rinse before applying a hydrogen peroxide enhanced action formulation agent as a disinfectant.
   - When cleaning:
     - if a bucket is used, do not 'double-dip' cloth(s)
     - do not shake out cloth(s)
     - change the cleaning cloth when it is no longer saturated with disinfectant and after cleaning heavily soiled areas such as toilet and bedpan cleaner
     - if there is more than one patient/resident bed space in the room, use fresh cloth(s) for each and complete the cleaning in each bed space before moving to the next
   - Start by cleaning doors, door handles, push plate and touched areas of frame.
   - Check walls for visible soiling and clean if required.
   - Clean light switches and thermostats.
   - Clean wall mounted items such as alcohol-based hand rub dispenser and glove box holder.
   - Check and remove fingerprints and soil from low level interior glass partitions, glass door panels, mirrors and windows with glass cleaner.
   - Check privacy curtains for visible soiling and replace if required.
   - Clean all furnishings and horizontal surfaces in the room including chairs, window sill, television, telephone, computer keypads, night table and other tables or desks. Lift items to clean the tables. Pay particular attention to high-touch surfaces.
   - Wipe equipment on walls such as top of suction bottle, intercom and blood pressure manometer as well as IV pole.
   - Clean bedrails, bed controls and call bell.
   - Clean bathroom/ shower. After cleaning, apply a sporicide to all surfaces in the bathroom and ensure sufficient contact time with the disinfectant (omit this step if the cleaning product is also a sporicide).
   - Clean floors.
5. Disposal
   - Place soiled cloths in designated container for laundering.
   - Check sharps container and change when ¾ full (do not dust the top of a sharps container).
   - Remove soiled linen if bag is full.
   - Place obvious waste in receptacles.
   - Remove waste.

6. Remove gloves and clean hands with ABHR; if hands are visibly soiled, wash with soap and water. DO NOT LEAVE ROOM WEARING SOILED GLOVES.
7. Replenish supplies as required (e.g., gloves, ABHR, soap, paper towel).
8. Clean hands with ABHR.

Cleaning Following Discharge/ Transfer/ Discontinuation of Precautions – double cleaning

1. Clean hands using ABHR and put on gloves.
2. Remove all dirty/ used items (e.g., suction container, disposable items).
3. Remove curtains (privacy, window, shower) before starting to clean the room.
4. Discard and replace the following:
   - Soap
   - Toilet paper
   - Paper towels
   - Glove box
   - Toilet brush
5. Remove dirty linen:
   - Strip the bed, discarding linen into soiled linen bag; roll sheets carefully to prevent aerosols.
   - Inspect bedside curtains and window treatments; if visibly soiled, clean or change.
   - Remove gloves and clean hands.
6. Apply clean gloves and clean/disinfect the room, working from clean to dirty and from high to low areas of the room:
   - Use fresh cloths, mop, supplies and solutions for cleaning each patient/resident bed space:
     - If a bucket is used, **do not 'double-dip' cloth(s)** back into cleaning solution once used.
     - Change the cleaning cloth when it is no longer saturated with disinfectant and after cleaning heavily soiled areas such as toilet and bedpan cleaner.
     - If there is more than one patient/resident bed space in the room, use fresh cloth(s) for each and complete the cleaning in each bed space before moving to the next.
   - Clean all surfaces and disinfect **using a sporicidal agent,** allowing for the appropriate contact time with the disinfectant.
   - Start by cleaning doors, door handles, push plate and touched areas of frame.
   - Check walls for visible soiling and clean if required; remove tape from walls, clean stains.
   - Clean light switches and thermostats.
   - Clean wall mounted items (e.g., ABHR dispenser, glove box holder, top of suction bottle, intercom, blood pressure manometer).
   - Check and remove fingerprints and soil from low level interior glass partitions, glass door panels, mirrors and windows with glass cleaner.
   - Check privacy curtains for visible soiling and replace if required; in long-term care, change curtain.
   - Clean all furnishings and horizontal surfaces in the room including chairs, window sill, television, telephone, computer keypads, night table and other tables or desks. Lift items to clean the tables. Pay particular attention to high-touch surfaces.

- Clean equipment (e.g., IV pole and pump, walkers, wheelchairs).
- Clean inside and outside of patient/ resident cupboard or locker.

7. Clean the bed
   - Clean top and sides of mattress, turn over and clean underside.
   - Clean exposed bed springs and frame.
   - Check for cracks or holes in mattress and have mattress replaced as required.
   - Inspect for pest control.
   - Clean headboard, foot board, bed rails, call bell and bed controls; pay particular attention to areas that are visibly soiled and surfaces frequently touched by staff.
   - Clean all lower parts of bed frame, including casters.
   - Allow mattress to dry.
8. Clean and disinfect bathroom/ shower using a sporicidal agent as disinfectant.
9. Clean floors.
10. **Using fresh cloths, mop head, supplies and solutions, re-clean and disinfect the room, using the above procedure.**
11. Disposal:
    - Place soiled cloths in designated container for laundering.
    - Check sharps container and change when ¾ full (do not dust the top of a sharps container).
    - Remove soiled linen bag and replace with fresh bag.
    - Place obvious waste in receptacles.
    - Close waste bags and remove; clean waste can/holder if soiled and add a clean bag.
12. Remove gloves and clean hands with ABHR. If hands are visibly soiled, wash with soap and water. **DO NOT LEAVE ROOM WEARING SOILED GLOVES**.
13. Remake bed and replenish supplies as required (e.g., gloves, ABHR, soap, paper towel, toilet brush).
14. Replace curtains with clean curtains following second cleaning.
15. Return cleaned equipment (e.g., IV poles and pumps, walkers, commodes) to clean storage area.

Appendix D: Patient Education Information Samples

The patient education tools on the following pages are used with permission of The Ottawa Hospital and are provided to assist the health care setting in developing their own patient education information.

Antibiotic-associated Diarrhea

Patient Information

If you have received antibiotics while in hospital, or have been prescribed antibiotics that you are to take following discharge from hospital, please review this information sheet on antibiotic-associated diarrhea. If you have any questions, ask your nurse, doctor, or pharmacist.

Antibiotics can cause diarrhea in up to one third of people who take them. Most often, the diarrhea is mild. Sometimes, a more serious type of diarrhea associated with taking antibiotics is caused by the *Clostridium difficile* bacterium.

Why can diarrhea occur with antibiotics?

Bacteria are normally present in your bowel. Diarrhea can occur because antibiotics kill some of the bacteria that usually live in your bowel. This upsets the normal balance. Sometimes harmful bacteria such as *Clostridium difficile,* if present in your bowel, can overgrow leading to diarrhea and other symptoms. The risk of *Clostridium difficile* is higher if you have been in the hospital.

What are the symptoms?

Diarrhea from antibiotics is usually mild, consisting of loose and/or frequent bowel movements. Symptoms of *Clostridium difficile* diarrhea may be more severe and may include:

- Watery diarrhea that may contain mucus and/or blood
- Abdominal pain or tenderness
- Loss of appetite
- Nausea
- Fever

What should you do if you get diarrhea?

If you are taking an antibiotic and have mild diarrhea that is not bothersome and you are able to eat and drink without difficulty, continue to take the antibiotic as prescribed. The diarrhea should go away after the antibiotic is finished.

***CALL YOUR DOCTOR IF* you have *any* of the following symptoms:**

- Diarrhea which is bothersome or severe, or which is bloody
- Abdominal pain
- Fever
- Diarrhea which continues after the antibiotic is finished
- Diarrhea which starts after you have finished taking the antibiotic(s).

Remind your doctor that you have recently been on antibiotics.

DO NOT take anti-diarrhea medications that you can buy without a prescription (example Imodium or Kaopectate) without first checking with your doctor. These may cause a more serious health condition.

How can you take care of yourself?

- Follow your doctor's advice regarding rest, activity, medication and diet.
- Wash your hands frequently, especially after using the washroom and before eating or preparing food.
- If your doctor prescribes a new antibiotic for your diarrhea, take all of the medicine as prescribed.
- Be sure that you drink plenty of fluids to keep hydrated.

Sample Patient Information: *Clostridium difficile*

What is *Clostridium difficile*?

Clostridium difficile (also known as *C. difficile* or *C. diff*) is one of the many germs (bacteria) sometimes found in the intestines.

How do people get *C. diff*?

C. diff germs and their spores are present in diarrhea of a person with a *C. diff* infection. Others can become infected if they touch a surface (toilet, bedpan, bed railing, etc.) covered with *C. diff*, and then touch their mouths. Health care providers can also spread this germ if they don't clean their hands prior to caring for their patients.

How does *C. diff* make people sick?

Although antibiotics can be lifesaving medications, they also destroy the good germs in a person's intestines. When this happens, *C. diff* if present will grow to unusually high levels in the intestines and make dangerous toxins. These toxins can damage the intestines and may cause diarrhea. Infection with *C. diff* is usually mild but sometimes can be severe. In severe cases, surgery may be needed and in extreme cases infection with *C. diff* may cause death. Infection with *C. diff* doesn't usually make healthy people sick, whereas, older hospitalized persons taking antibiotics are at the highest risk of severe illness.

What are the symptoms of an infection with *C. diff?*

Symptoms include diarrhea (mild or severe), fever, loss of appetite, nausea, abdominal pain and tenderness. If you have symptoms of *C. diff* infection, your doctor will request that a sample of your diarrhea be tested to see if the dangerous toxins are present.

Can infections with *C. diff* be treated?

Treatment depends on how sick a person is with an infection caused by *C. diff.* People with mild symptoms may not need treatment. For more severe infections, medications such as antibiotics are given and sometimes surgery is necessary.

What does the hospital do to prevent the spread of the *C. diff* germ?

Hand washing is the most important way for everyone to prevent the spread of this germ. Patient safety is very important. Our goal is to always identify patients with *C. diff* infections quickly and institute infection control measures accordingly. If you develop diarrhea you will be moved to a private room, and your health care provider will care for you wearing gloves and maybe a gown. During the time you have diarrhea, you will be asked to stay in your room; however, you may still have visitors. We will ask your visitors to clean their hands upon entering and exiting your room.

What special precautions are needed for *C. diff* at home?

Generally speaking, people in the hospital are sicker and get more infections than people in the community. Once home, precautions need not be as strict. Nonetheless, certain steps can help reduce the risk of spreading this germ to family members and other visitors.

Wash your hands for at least 15 seconds after using the toilet, before eating or before preparing food. Caregivers should wash their hands after providing care. Gloves should be used to handle body fluids or dirty items. Discard disposable gloves in the regular garbage or clean rubber gloves after use.

No special precautions are required to clean your home. This germ can be destroyed by most household cleaning products or diluted household bleach. Wet a clean cloth thoroughly with a properly diluted cleaning product. Wipe surfaces starting from the cleanest area and moving towards the dirtiest area, paying special

attention to areas such as the toilet and bathroom sink. Let the surfaces air dry. This will allow enough contact time with the cleaning product to kill the bacteria.

What do I need to know prior to discharge?

Your health care provider will review good hygiene practices with you before you go home. It is very important that you take all your medication as prescribed by your doctor. You should not use any drugs from the drugstore that will stop your diarrhea (e.g. Imodium). **If diarrhea persists or comes back, contact your family doctor.**

If you want to know more about *Clostridium difficile* infection:

- Ministry of Health and Long-Term Care Ontario: http://www.health.gov.on.ca/en/ccom/cdi/
- Centers for Disease Control and Prevention: http://www.cdc.gov/hai/organisms/cdiff/Cdiff-patient.html

Appendix E: Sample Outbreak Line Listing of Patients/ Residents with CDI

The following information may be documented on a line listing in a *C. difficile* outbreak (see sample chart following):

- Case demographics
  - Name
  - Location – current room
  - Gender (male/female)
  - Date of birth
  - Admission date
  - Names of roommates
- Symptoms
  - Date of onset of diarrhea
  - Number of episodes of diarrhea per day
  - Consistency of stools
  - Fever
  - Prior laxatives prescribed
  - Prior antibiotics prescribed
  - Other symptoms
- Laboratory testing
  - Date specimen sent
  - Result
- Case confirmation by
  - Laboratory result
  - Pseudomembranous colitis
  - Histopathology
- Treatment of CDI
  - Antimicrobial prescribed
- Symptoms resolved
  - Date symptoms resolved
- Complications
  - Record any complications or deaths attributable to CDI

C. DIFFICILE LINE LISTING OF CASES **Start of Outbreak: _____** **End of Outbreak: _____**

Case Demographics					Clinical Symptoms						Laboratory Tests		Case Confirmation			CDI Treatment	Resolution	
Name	M/F	Location/ Unit	DOB	DOA	Onset date	# Episodes diarrhea/day	Stool consistency	Fever	Laxatives prescribed	Other symptoms	Specimen date	Specimen result	confirmation test	PMC	Histopathology results	Antimicrobial prescribed	Date resolved	Attributable complications

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