Gastrointestinal Infection Outbreak Guidelines for Healthcare Facilities

Reference Document for use by Health Care Organizations for Internal Policy/Protocol Development

British Columbia Provincial Infection Control Network
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Acronyms

ABHR - Alcohol based hand rub
BCCDC - British Columbia Centre for Disease Control
EHO - Environmental Health Officer
GI – Gastrointestinal
HCP – Health Care Provider
ICO – Infection Control Officer
ICP - Infection Control Professional
LPN – Licensed Practical Nurse
LO – Community Care Licensing Officer
MHO – Medical Health Officer
OHN – Occupational Health Nurse
OPMT – Outbreak Prevention and Management Team
PCRA – Point of Care Risk Assessment
PIDAC – Provincial Infectious Disease Advisory Committee, Ontario
PPE – Personal Protective Equipment
RN – Registered Nurse
WH&S – Workplace Health and Safety
1.0 Gastrointestinal Infection Outbreak Management

1.1 Introduction
Gastrointestinal (GI) infections may be caused by a variety of agents including bacteria, viruses and protozoa. Healthcare associated transmission of GI infections usually results from contact with infected individuals, from consumption of food, water, or other beverages, or from exposure to contaminated objects or environmental surfaces (1).

Outbreaks of GI infections can be devastating and lead to significant increased costs, increased patient morbidity, and in some instances patient mortality. Henson et al. (2) gave the mean estimate of the overall economic burden of GI infections to be 514 million dollars per year in British Columbia.

The most important characteristic of pathogens responsible for infectious GI infections is their ability to be rapidly transmitted in healthcare settings among individuals who often are highly susceptible. Episodes of infectious GI infections account for a significant proportion of all patients/residents/clients in healthcare settings who develop diarrhea with or without nausea and/or vomiting.

1.2 Purpose
This reference document is intended to provide information and guidance for all healthcare facilities when developing or updating their policies and processes that pertain to prevention, surveillance for, identification and control of GI infection outbreaks. This document was not developed to address an outbreak cause by *Clostridium difficile*, although many of the same principles still apply. Please consult literature written specifically for this organism such as “Control of Clostridium Difficile Infections (CDI) Outbreaks in Hospitals” by PIDAC. This document will enable policy or protocol development to be more straightforward, timely and require less resources. Effective outbreak management requires a collaborative effort between Public Health, Infection Prevention and Control, Laboratory Services, Workplace Health and Safety, facility Managers and facility HCPs.

1.3 Literature Search Strategy
Electronic searches of Medline, Science Direct, PubMed, Google Scholar and Cinahl (January 2004 - November 2009) were carried out to identify relevant papers. For key questions where insufficient evidence was found the literature search date was extended to 1995. Search terms used were: rotavirus, calicivirus, norovirus, *Salmonella, Escherichia coli*, adenovirus, or infections caused by these agents, gastrointestinal diseases, communicable diseases, disease outbreaks, virus shedding, infection control, alcohol, anti-infective agents, immunity after infection, hospital food service, kitchen, cooking utensils, eating utensils, animals and pets. References cited in eligible papers that were considered to be relevant were also obtained. Of those titles identified 436 abstracts were reviewed and 139 full articles were read.
1.4 Methods
The recommendations made within this guideline are graded based on the level of supporting evidence available, using the Public Health Agency of Canada rating scale for strength and quality of evidence (Appendix 1). The grading level assigned does not relate to the importance of the recommendation, but to the strength of the supporting evidence. Evidence tables were created by the writer where moderate to strong evidence to support the recommendations was available. These tables were reviewed by the Guideline Working Group (GWG). For recommendations based on the expert opinion of the GWG members, any differences in opinion were resolved through discussion and consensus. This process was reviewed and approved by the Guidelines Steering Committee.

1.5 Background
Often pathogenic organisms do not cause GI infections because of the protective mechanisms of the GI tract. Under normal circumstances organisms are unable to establish themselves in quantities sufficient to cause illness because they are carried straight down the GI tract and excreted with the rest of the intestinal contents. Also the presence of mucus protects the epithelial cells that line the GI tract, perhaps acting as a mechanical barrier by blocking attachment to the epithelial cells. The mucus also contains IgA antibodies which help protect an individual when their immune system is healthy (3).

Specific attributes have been developed by some organisms that enable them to overcome the body’s natural defenses. These include: (4)
- Specific attachment to intestinal epithelium which enables them to avoid expulsion and establish themselves.
- Motility, which enables them to travel through mucus allowing the pathogen to reach susceptible cells.
- Production of mucinase, an enzyme that assists the transit through any mucus that is present.
- Resistance to stomach acids which allows them to reproduce in large numbers in the stomach and produce infection and shedding from the GI tract.
- Resistance to bile and proteolytic enzymes which allows them to reproduce in large numbers in the GI tract.

When the infecting microorganism penetrates the intestinal epithelium the severity of the illness that it is able to produce depends upon: (3)
- It’s ability to multiply in large numbers and spread throughout the GI tract,
- The production of toxins,
- The degree of cell damage it is able to cause and
- The individuals inflammatory and immune responses.

For a table containing the most common agents that cause GI infection outbreaks and their individual characteristics (i.e. incubation period, duration of symptoms) please see Appendix 2.
2.0 The Outbreak Prevention and Management Team (OPMT)

Organizational leadership is critical in all health care settings to ensure effective outbreak prevention and control. Ideally, all facilities should have a designated OPMT. This group is responsible for ensuring that measures for preventing outbreaks are in place and for directing and overseeing the management of all aspects of any outbreak. OPMT members should have decision making authority for their discipline within the facility or unit. A lead person from this group should be appointed to coordinate the meeting(s) during an outbreak. The membership of an OPMT will depend upon the facilities location, size and contractual status. Membership may include:

- A medical advisor (if available)
- Infection control physician (if available)
- Medical Health Officer or delegate
- An administrator
- A Director of Care
- An ICP or person responsible for infection control of that site
- An Occupational Health Nurse or person responsible for occupational health
- An Environmental Health Officer or alternate (e.g. Community Care Facility Licensing Officer)
- A laboratory manager or representative
- A person responsible for support services such as housekeeping and laundry
- A foods services supervisor
- Communications coordinator
- Front line HCP representative (e.g. charge nurse)

A written process for GI Outbreak Management which includes current membership of the OPMT with contact information should be available to all HCPs. This should be reviewed and updated annually.

Category B111

2.1 Roles and Responsibilities During a Gastrointestinal Infection Outbreak

The BC Public Health Act and Community Care and Assisted Living Act defines the roles and responsibilities of the MHO and EHO in outbreak control. The remaining roles and responsibilities have been recommended by consensus of the GI Outbreak Guidelines Working Group with the understanding that in some Health Authorities or facilities responsibilities may be delegated or shared differently depending upon the type of care provided, resources or physical setting. There is therefore some overlap in the description of roles.

British Columbia Centre for Disease Control (BCCDC) Public Health Microbiology & Reference Laboratory

Provides advice on sample collection, testing, and timely processing of samples and reporting back to a designated contact person.
Environmental Health Officer (EHO)
Enforces BC Public Health legislation in regard to disease control and protection of the public. Works with the MHO in conjunction with the facility ICP management and HCPs to ensure that appropriate outbreak control measures will be put into place in preparation for an outbreak. Acts as a consultant and provides support/resources prior to and during an outbreak; communicates/liaises promptly with the MHO and Infection Control when outbreaks are suspected and/or have been declared. Provides expertise in determining the source and means of spread of the agent, especially where food or waterborne spread may be involved.

Facility Administrator/Manager or Director of Care
Ensures that patients/residents/clients receive care in a safe environment by working collaboratively with ICP/EHO/MHO to ensure that HCPs are familiar with outbreak prevention and control processes and ensures timely implementation of control strategies which may include providing additional resources. Works collaboratively with WH&S to monitor and report HCPs illness.

Infection Control Officer (ICO)
Usually a physician but may be a senior ICP that is responsible for leading the infection control program in a facility. Provides primary direction in outbreak pre-planning and control.

Infection Control Professional (ICP)
Works with the MHO and/or EHO and in conjunction with the facility manager and HCPs to ensure that appropriate outbreak mitigation measures are in place in preparation for an outbreak occurrence. Acts as a consultant and provides support/resources prior to and during an outbreak to ensure control strategies are initiated promptly; communicates/liaises promptly with Environmental Health and/or the MHO when outbreaks are suspected and/or have been declared.

Local Laboratory/ Medical Microbiologist
Provides advice on appropriate lab specimens to facilitate diagnostics (in conjunction with BCCDC) and assists in timely transportation of specimens to BCCDC where appropriate. In some cases may perform initial specimen testing.

Media/Public Relations
With guidance from the MHO and Outbreak Prevention and Management Team develops appropriate public announcements.

Medical Director or Facility Individual Physicians
Works collaboratively with the Facility Manager and EHO/ICP/MHO to ensure that patients/residents/clients receive care in a safe environment.

Medical Health Officer (MHO)
Consults with Infection Control, EHO, Occupational Health, Medical Director, Administrators and Nursing HCPs, concerning outbreak declaration, control measures and declares the end of an outbreak. The MHO has legislative authority and responsibility, according to the Public Health Act, to control the outbreak. The MHO may delegate this responsibility. In many situations, jointly developed protocols are in place to guide outbreak detection and management and the Medical
Health Officer may not be directly involved with each outbreak. Even if such protocols are in place, the authority of the Medical Health Officer to direct the local response remains in place.

**Health Care Provider (HCP: includes all disciplines who provide direct care)**
Work collaboratively with MHO/EHO/ICP and the Facility Managers to ensure best practices are used for the prevention and control of GI Outbreaks. This includes early recognition of clusters of GI infections, diligent use and promotion of hand hygiene, early recognition of possible outbreaks and timely implementation of control strategies.

**Support Services**
Assists in outbreak management by ensuring additional resources such as personnel, supplies, enhanced cleaning etc. are available.

**Workplace Health and Safety (WH&S)/Occupational Health**
In collaboration with Infection Control or the Facility Manager, monitors and tracks HCPs illness; provides support and education related to sick time and compensation of health care workers.
### 2.2 Action Table

Note: A Quick Reference Guide for GI Outbreak Management is found in Appendix 3

<table>
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<th>Action</th>
<th>Positions Suggested (often taken on in combination of several positions and may vary depending upon the specific setting).</th>
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<tbody>
<tr>
<td>Ensures that GI Outbreak prevention measures are in place such as Routine Practices, identifies suspected outbreaks and communicates promptly with appropriate resources when an outbreak is suspected</td>
<td>Unit Manager, Facility Administrator, HCP</td>
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<tr>
<td>Confirms that cases meet case definition for GI Outbreak. Declares the outbreak and verify nature and extent. Forms an hypothesis as to the source and mode of transmission</td>
<td>EHO, ICP, MHO, Medical Microbiologist, ICO, Facility Administrator, Unit Manager</td>
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<tr>
<td>Reports Outbreak to MHO and other appropriate external agencies</td>
<td>EHO, ICP, BCCDC, ICP, CD unit of Public Health</td>
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<td>Implements control strategies</td>
<td>ICP, EHO, Unit Manager, Charge Nurse, HCP, OPMT</td>
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<tr>
<td>Provides media with information which can be used for public announcements</td>
<td>MHO, Medical Microbiologist, Facility Administrator, Infection Control Officer, Media spokesperson from OPMT, Communications Coordinator</td>
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<td>Provides advice on activity restrictions, admission, and transfer limitations</td>
<td>MHO, EHO, ICP, Facility Care Manager, Charge Nurse</td>
</tr>
<tr>
<td>Coordinates on-going surveillance during outbreak</td>
<td>EHO, ICP, Unit Manager, Charge Nurse</td>
</tr>
<tr>
<td>Maintains a registry of patients/residents/clients who meet the case definition</td>
<td>ICP, Site Manager, HCP, Charge Nurse</td>
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<td>Ensures enough supplies (e.g. gloves, gowns) for HCP to give safe care</td>
<td>Unit Manager, Support Services Managers</td>
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<tr>
<td>Mobilizes Outbreak Prevention and Management Team</td>
<td>ICP, EHO, Facility Administrator Unit Manager</td>
</tr>
<tr>
<td>Coordinates, collects and sends appropriate specimens</td>
<td>Unit Manager, HCP, Laboratory, ICP, WH&amp;S, EHO, Medical Microbiologist, Dietary Manager (if food borne suspected)</td>
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<tr>
<td>Ensures communication with allied health care workers</td>
<td>ICP, EHO, Unit/Site Manager, Charge Nurse</td>
</tr>
<tr>
<td>Maintains list of HCPs who have been ill</td>
<td>WH&amp;S, Unit/Site Manager, ICP, EHO</td>
</tr>
<tr>
<td>Educates patients/residents/clients, visitors, volunteers on hand hygiene and promote control strategies</td>
<td>ICP, EHO, Unit Manager, HCP, Charge Nurse</td>
</tr>
<tr>
<td>Completes a report of Outbreak for Internal reporting</td>
<td>ICP, EHO, Unit Manager, ICO</td>
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3.0 Identifying an Outbreak

3.1 Case Definition
A case of probable GI infection is defined as any one of the following conditions that cannot be attributed to another cause (e.g. laxative use, medication side effect, diet, prior medical condition):

- Two or more episodes of diarrhea in a 24 hour period – above what is considered normal for that individual
  OR
- Two or more episodes of vomiting in a 24 hours period
  OR
- One episode each of vomiting and diarrhea in a 24 hours period
  OR
- Positive culture for a known enteric pathogen with a symptom of GI infection (e.g. vomiting, abdominal pain, diarrhea)
  OR
- One episode of bloody diarrhea

3.2 Potential Outbreak/Alert Stage
When one or two suspect cases of GI infection occur within a 4-day period, it is recommended that the facility:

- Segregate patients/residents/clients with GI illness and continue to use Routine Practices plus Contact Precautions when providing direct care.
- Ensure implementation of thorough hand hygiene and Routine Practices throughout entire unit/site.
- Increase monitoring and recording of GI symptoms on remainder of patients/residents/clients.
- Record self reported GI symptoms among HCP.

3.3 Outbreak Definition
Three or more cases of GI infection (as defined above), potentially related, occurring within a four day period, within a specific geographic area (i.e. unit, ward).

4.0 Reporting and Notification
According to the Public Health Act all GI outbreaks in health care facilities must be reported to the MHO and/or designated Public Health contact (i.e. EHO, CD team). The facility Manager/Director of Care or Infection Control Professional should also notify the Infection Control Officer and mobilize the Outbreak Prevention and Management Team. An example of an initial Outbreak Report Form is found in Appendix 4.
5.0 Identifying the Source(s)

Although it is often not initially clear what the source of the outbreak may be, it is important to think about this from the beginning. The type of specimens to collect and send may depend upon the suspected source (e.g. food borne versus viral pathogen). To determine the source one must understand the possible common sources, potential modes of transmission, usual reservoirs, incubation periods and the microbiological traits of the pathogen of concern. This information will enable one to formulate a hypothesis on the type of organism, index case or source, initiate the appropriate observation strategy and ensure the correct specimens are collected and sent for confirming the hypothesis (5). The ability to identify the source will also provide information that will be helpful in bringing the outbreak to an end. The Medical Health Officer or Environmental Health Office will provide consultation for this process.

A common-source GI infection outbreak occurs from exposure to a pathogen in food or water. This can result from a single exposure to the agent or from repeated exposures. Usually, common-vehicle outbreaks are characterized by explosiveness of onset and limitation or localization in time, place and people. A typical example of this is a single source of exposure such as a pathogen from a food item (6). If a large number of people become ill within a very short time period and within a limited location, one should consider a “common source” such as food or water.

A propagated source occurs when there is successive transfer from person to person (6). These situations may begin as a few cases and each day bring a few more cases as the first ones recover. This usually occurs when someone introduces the infectious agent into the facility making one or two people ill, who in turn infect others, and so on.

Questions that should be considered are:

- Who were the first individuals to become ill?
- What was the timing between each case? Did they all become ill within a short period of time (minutes to a few hours) or was there a longer period of time between each case?
- Was there an activity or an outing that they have in common?
- Are they or were they located in the same place? (could be unit, site, area)
- Was there any object that they shared? (food, equipment)

Clusters of patients/residents/clients who develop diarrhea, nausea and vomiting lasting only a few days, accompanied by symptomatic healthcare workers should lead to seeking a viral etiology (7).
5.1 Collection of Specimens (8)

5.1.1 Clinical Specimens
Clinical specimens include feces and vomitus. Collect specimens as early in the infection as possible (within 3 days of the onset of symptoms in the individual). Use the outbreak kit provided by the BCCDC Public Health Microbiology & Reference Laboratory for the collection of clinical specimens. See Appendix 5 for an order form for “Gastrointestinal Disease Outbreak Kits”.

If a bacteria or virus is suspected:
- The sterile dry fecal container with spoon is for bacteriological and viral testing, and has no liquid in it. This should be filled to the line, as a maximum (10 ml of feces is minimum amount required).
- Larger vials with white lids are for vomitus specimens and contain no liquid.

If a protozoan/parasite is suspected:
- The red-capped vial contains SAF preservative and is for testing for the presence of protozoa (e.g. *Giardia*, *Cryptosporidium*). The preservative must be kept in the vial, and the ratio of specimen to liquid is 1:3 (about 2 to 3 spoonfuls of specimen using the built-in spoon). Note the expiry on the container.

Storage and shipping:
- Feces and vomitus samples may be kept at room temperature if sent the same day
- BCCDC requires specimens to reach them within three days
- Feces should be kept at a temperature between 15-18 °C during transport
- Vomitus should be kept at 4 °C during transport. A small ice pack may be added to the transport cooler as long as the specimens do not become frozen.

Please see Appendix 6 for an example of the BCCDC notification form and Appendix 7 for the requisition to use with each sample to be submitted. It is important that the Outbreak Identification number is indicated on all forms. Please follow the instructions provided on the form.

5.1.2 Environmental Samples
If food or water is suspected as the source of the outbreak the EHO may collect samples of food served recently (if available) or samples of the water. Food that has been implicated should be submitted in their original containers or placed into sterile plastic containers or whirlpak plastic bags and refrigerated. Requirements for water vary with the suspected microorganism. The EHO, MHO or Medical Microbiologist will provide direction regarding water specimen collection, if required.
6.0 General Principles of Control

6.1 Mode of Transmission from Person to Person
GI infections are spread from person to person primarily through direct or indirect contact via the fecal/oral route. Direct contact can occur when the transfer of microorganisms results from direct physical contact between an infected or colonized individual and a susceptible host (body surface to body surface without barriers). Transfer of microorganisms to a host may also occur indirectly via an intermediate object, such as contaminated hands that are not cleaned between patients/residents/clients or contaminated patient/resident/client care equipment. Current literature also suggests that in the case of some small round structured viruses (e.g. norovirus) exposure may occur from suspended droplets during some situations (e.g. someone is actively vomiting, gross contamination of environment with vomitus or feces) (9-12).

6.2 Routine Practices (13)
Routine practices is the term used by Public Health Agency of Canada to describe the system of infection prevention and control practices used to prevent the transmission of infections in health care settings. Routine practices should be used with all clients at all times. A full description of these may be obtained from: http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/99vol25/25s4/index.html

Close attention to Routine Practices is fundamental to preventing transmission of microorganisms among patients/residents/clients and HCP in all health care settings. The four basic elements of Routine Practice are outlined in Appendix 8.

6.3 Additional Precautions (13)
Additional Precautions are used in addition to Routine Practices when an infection with a specific mode of transmission is suspected or confirmed and Routine Practices are not sufficient to prevent transmission. Additional precautions, such as Contact Precautions, will be required during a GI outbreak to control the spread of infection. Patients/residents/clients and their visitors should be assisted to understand the requirements for the additional precautions being used. Health care settings should ensure that HCPs have quick and easy access to the personal protective equipment (PPE) and cleaning products required when providing care.

6.4 Risk Assessment (13)
A risk assessment is the evaluation of the interaction between the Health Care Provider (HCP), the patient/resident/client and the environment to determine the potential for exposure to pathogens. Prior to any patient/resident/client interaction all HCPs have a responsibility to always assess the infectious risk posed to themselves and to others (e.g. other patients/residents/clients, visitors, other HCP). A risk assessment in a GI outbreak setting would include considering:
  • Potential exposure to body fluids (i.e. active vomiting, explosive diarrhea)
  • Exposure to large deposits of body fluids (vomitus, feces) on environmental surfaces
  • Patient/resident/client’s continence level and ability to comply with instructions
6.5 Personal Protective Equipment (9-12)
During an outbreak of GI infection care givers should wear the following PPE when giving direct care to symptomatic patients/residents/clients:
- Gloves – for providing any direct care
- Gowns – when contamination of HCPs clothing is possible
- Surgical mask with eye protection/face shield to protect mucus membranes from exposure to viral particles when assisting someone who is actively vomiting, has explosive uncontained diarrhea or when cleaning an area grossly contaminated with vomitus or feces. Category B111

6.6 Placement of Patient/Resident/Client
In acute care facilities, a single room with a toilet and hand hygiene facilities is preferable. If large numbers of patients/residents/clients require Contact Precautions simultaneously, single room accommodation may not be possible. In this case, it is advisable to cohort patients/residents/clients with similar symptoms. When single rooms are scarce and/or cohorting is not feasible:
- Avoid placing a patient/resident/client with GI symptoms in the same room as a patient who is at high risk for complications (e.g. immunocompromised, recent surgery etc.).
- In a shared room, a patient/resident/client with symptoms should not share a toilet with a well patient/resident/client. Assign a dedicated toilet or commode.
- In shared rooms, roommates and all visitors must be aware of the precautions to follow. Select roommates for their ability to comply with precautions Category B111

Whenever possible, dedicate equipment to be used only on that patient/resident/client. In the event that equipment must be shared, thorough cleaning and disinfection is required in between patients/residents/clients. Category B111

6.7 Limiting movements of Patients/Residents/ Clients

6.7.1 Patient/Resident/Client Safety
Research has shown an increase in feelings of depression and anxiety and adverse events in patients/residents/clients who are isolated (14-17). Time spent segregated or isolated should be kept as short as possible. When isolation cannot be avoided, strategies designed to diminish the negative impact and protect the patient/residents/clients should be implemented. Category B11
Examples of these are:
- one to one supervision of meals for those who have difficulty swallowing
- monitoring of patients/residents to ensure adequate nutritional and fluid intake
- increasing frequency of rounds to provide oral fluids for patients/residents/clients
- planned one to one (or room to room) interactions with priority given to those who have cognitive issues
- physiotherapy or other rehabilitative therapy should continue of individual well enough

6.7.2 Acute Care
Symptomatic patients should be confined to their room and only taken elsewhere for medically necessary procedures until they have been asymptomatic for 48 hours(10). Category B11
6.7.3 Residential Care
Any resident/client with symptoms that are consistent with GI infection should be confined to their room as much as possible until asymptomatic for 48 hours (10). Since confinement of residents/clients, even for a few days, could have adverse effects on their well being it is important not to socially isolate them and keep the period of confinement to a minimum (14-17). Category B11

Consideration should also be given to decreasing or discontinuing group activities, shared food and outings until the outbreak is resolved. It should be noted that limitation of such activities could be very disruptive to the residents/clients. Limiting activities to restrict movement of residents only between units or floors may be an option. Category B11

6.7.4 Common Areas
If, upon consultation with the MHO or delegate, it is decided that some activities may continue these should be restricted to individuals who are symptom free. Encourage hand hygiene for all patients/residents/clients prior to meals. Remove all common touch items from the shared areas (e.g. salt and pepper shakers, sugar bowls, table cloths) (10). Remove and discard food in refrigerators found in common areas or nourishment areas and clean these appliances. Category B11

HCPs should also avoid sharing meals or leaving food items open in their HCPs room. No food items (e.g. bowl of candy, tray of cookies) should be left open in or near patient/resident/client areas (e.g. nursing station). Category B11

7.0 Restrictions of Units
Restricting new admissions and/or transfers to units or facilities is a commonly used control strategy during GI outbreaks. Restricting admissions helps to control outbreaks by reducing the pool of susceptible people and thus the potential for ongoing spread of infection. The direct contribution of this action is difficult to estimate because usually several control mechanisms are deployed simultaneously. One identified benefit is that as beds become vacant from discharges and remain unfilled the need for nursing hours decreases. This is helpful at a time when many HCPs are also ill and excluded from work. On the other hand, there is a loss of revenue for facilities and a delay in treatment for other individuals if surgeries, diagnostic tests or other treatments are cancelled and other departments (i.e. emergency) will experience an increase in demand (10, 18-20).

Repatriation or transfers of patients/residents between acute and residential care sites should be evaluated on an individual basis. It is recommended that protocols are developed locally to address situations where patients/residents are moved between acute care and residential care.

The local Medical health Officer should be consulted when considering restrictions or closures of units or facilities.
8.0 HCPs Exposure and Illness

Any HCP who develops symptoms consistent with a GI infection (e.g. vomiting, diarrhea) while at work should be required to leave work immediately (10).  

Category B11

There is evidence that suggests that exclusion of employees from work for 48-72 hours after symptoms resolve may decrease attack rates (10, 21). It is difficult to know the exact contribution of any one action since outbreak control measures are usually implemented and are most effective when implemented in combination. Infected individuals will continue to shed the pathogen for longer than 48-72 hours following resolution of symptoms and it is unclear when they no longer are infectious to others (22-27). It is recommended that employees remain off work for at least 48 hours following resolution of symptoms. This may decrease the risk of the individual relapsing while at work.  

Category B11

Meticulous and consistent hand hygiene, which includes all surfaces of hands, wrists, finger tips and under fingernails, and use of protective barriers, should be re-emphasized for all HCPs upon return to work.  

Category B11

Infections caused by microorganisms such as Verotoxigenic E. coli, Salmonella typhi and paratyphi, and some Shigella and V. cholerae species have specific requirements before an individual may return to work. Consult with the MHO or EHO and refer to the “Exclusion of Enteric Cases and Their Contacts in High Risk Settings” Policy in the BCCDC Communicable Disease Control Manual.  

When possible it is advisable to have the same HCP caring for those who are ill to limit HCP exposure. Since some individuals acquire short term immunity following illness, HCPs who return to work after becoming ill with GI symptoms should also be assigned to ill patients whenever possible (28-31).  

Category B11

All health care providers should have easy access to the PPE required and be knowledgeable about how to use it. Managers should monitor PPE usage and reinforce the need to apply and remove PPE properly.  

Category B111

As much as possible, within the limitations of personal privacy issues, HCP illness should be tracked and recorded by Occupational health of the person responsible for Occupational Health. This allows for better surveillance of the extent of the outbreak, provides information regarding HCP resources available and may contribute important information towards determining the etiology of the outbreak.  

Category B111

Some health care providers move continually between units/sites as an integral element of their work (e.g. physiotherapists, laboratory technologists, patient porters). It is very important that these individuals are adept and vigilant with the use of PPE and hand hygiene.  

Category B111

Some health care providers work in more than one unit or site. In these cases it is recommended, that where this is unavoidable, HCPs be vigilant in self assessment for symptoms and be excused from work immediately should they begin to have symptoms (10).  

Category B111
9.0 Ongoing Surveillance and Reporting

An updated report with new cases of both patient/resident/clients and HCPs should be created by the facility/unit manager or ICP and sent to the EHO assigned to that site on a regular basis. Category B111

Appendix 9 provides an example form for patient/resident/client surveillance. Appendix 10 provides an example form for HCP surveillance.

10.0 Housekeeping

Dirt, organic material and debris acts to protect microbes from contact with disinfectants. Thorough cleaning removes this protection and facilitates effective disinfection. Consistent, regular cleaning assists in reducing the potential for environmental transmission of microorganisms and processes should already be in place to ensure effective cleaning (10, 32, 33). Cleaning methods which use firm contact and friction reduces the numbers of organisms. Use a separate cloth for cleaning and another for disinfection. Cleaning cloths should be changed frequently to prevent spreading microorganisms from surface to surface. Do not “double dip” a cloth into disinfectant solution.

Increased frequency of cleaning high touch surfaces is an important contribution to the control of spread. Surfaces that are considered to be “high touch” include:

- Bed rails
- Call bell cords
- Bathroom surfaces(taps, toilet handle)
- Door knobs, light switches
- Hand rails in rooms and hallways
- Elevator buttons
- Tables, counter tops
- Nourishment areas (fridges, ice machines, cupboard handles)
- Nurses station

Equipment that is shared between patients/residents/clients should be thoroughly cleaned and disinfected in between each use. Category B111

10.1 Disinfectants

Currently, available solutions that are effective for common microbes responsible for GI outbreaks are accelerated hydrogen peroxide 0.5% and sodium hypochlorite 1000ppm (34-37). A limited number of quaternary ammonium products have demonstrated effectiveness in recent studies (38, 39). New products are in development and may be appropriate in the future. Any disinfectant used in a health care setting is required to have a Drug Identification Number (DIN) assigned by Health Canada. The manufacturer should be able to provide evaluations that demonstrate the product’s effectiveness against common enteric agents (preferably from a third party). Follow the manufacturer’s instructions regarding dilution and contact time required to be effective. When organic matter is present (e.g. vomitus, feces) many disinfectants require the surfaces be cleaned with a detergent prior to disinfection. If in doubt about a cleaning product please contact the EHO/Public Health/ICP in your area. See Appendix: 11 for a table of commonly used products.
10.2 Cleaning Up Vomit and Feces
During an outbreak of GI infection, special consideration must be given to the cleaning of areas contaminated from either a vomiting or fecal accident. The area should be cordoned off to prevent other patients/residents/clients from unintentional exposure and cleaned immediately (10, 32, 33). Failing to immediately clean contaminated areas may contribute to rapid spread and continuation of outbreaks. For a detailed procedure for cleaning up excrement see Appendix: 12.

11.0 Visitors and Volunteers
Visitors and volunteers play an important role in supporting the provision of health care and the quality of experience of the patient/resident/client in all settings. Visitors and volunteers should be advised not to visit the facility if they have GI symptoms such as nausea, diarrhea etc. During an outbreak, visitors and volunteers should be warned that they may be at risk of acquiring infection within the facility, instructed how to wear appropriate PPE and required to use hand hygiene before and after their visit. Visitors should visit only their own friend/relative in their own room, unless otherwise approved by the HCP.

12.0 Animals and Pets
Animals or pets may be a source of a GI outbreak via direct or indirect contact. Patients/residents/clients should not be in contact with pets/animals that are unwell. Animals or pets should not be in an area where food or drink is prepared or served. Diligent hand hygiene practices are recommended before and after handling any animal, pet or providing any form of food (e.g. treats) to them (40-43). It is recommended that reptiles and/or amphibians are not housed or allowed to visit any type of health care facility.

13.0 Notification/Education Strategies
Timely, accurate communication is a critical contribution to limiting the spread of a GI outbreak, both within and beyond a facility/unit. It is recommended that the OPMT delegate one person to speak with the media to ensure that messages use consistent wording in the event that media statements are needed.

Daily updates regarding the extent of the outbreak should be composed by a designated member of the outbreak team and circulated to all departments/services who may be involved (e.g. physiotherapy, other unit managers, physicians).

Appendix: 13 provides an example of a Daily Update Report for the OPMT
Appendix: 14 provides an example of an Outbreak Communication Memo

External ancillary services such as BC Ambulance, Medigas etc. should be notified as soon as the outbreak is confirmed. Should they be required to attend the facility/unit they would be expected to use the same precautionary levels as the health care providers.

Information for visitors should begin as soon as an outbreak has been confirmed and include the type of outbreak suspected, restrictions for visiting (e.g. relatives only) and emphasis on hand hygiene before and after visit.
GI infection outbreak signs should be posted at all entrances to the facility indicating that there is an outbreak. For an example of a sign see Appendix: 15.

14.0 Declaring the Outbreak Over

The MHO has the legal authority and discretion to declare the outbreak over. Often protocols and guidelines are in place that enables an Infection Control Officer, ICP or Facility Manager to lift the outbreak control measures. It is the responsibility of the facility operator to inform the outbreak consultant (EHO, ICP, MHO etc.) when nearing or meeting the criteria for declaring the outbreak over. The MHO’s office is to be notified at the time of restrictions being lifted. Even under these circumstances the authority of the Medical Health Officer remains in effect.

If the causative agent is known, usually an outbreak is considered to have ended when there are no new cases after 2 incubation periods following the onset of symptoms in the last case. If the causative agent is unknown usually the outbreak is considered to have ended when there have been no new cases 72 hours after the resolution of acute symptoms of the last identified case. It is important that vigilant observation for new cases continues even after the outbreak is declared over, especially when the causative agent has not yet been identified. A summary of the outbreak should be compiled and sent to the OPMT. An example of an Outbreak Summary form is provided in Appendix: 16.

15.0 Debriefing the Outbreak Prevention and Management Team

It is strongly recommended that the OPMT schedule a debriefing session as soon as feasible following the conclusion of an outbreak. The purpose of the debriefing session is to evaluate how the outbreak management process unfolded and identify new interventions that worked well and opportunities for improvement. Examples of opportunities for improvement are:

- Communication within OPMT and to media
- Timeliness in recognizing and reporting outbreak
- Timeliness in implementing control measures
- Effectiveness of control measures in limiting the outbreak

Category B111
Glossary

Acute Care Facility: A hospital where lengths of stay average < 30 days, and where a variety of services are provided, including surgery and intensive care.

Additional Precautions: Interventions implemented for certain pathogens or clinical presentations in addition to routine infection control practices, to reduce the risk of transmission of microorganisms from patient to patient, patient to HCP, and HCP to patient

Case: In epidemiology, a person in the population or study group identified as having the particular disease, health disorder or condition under investigation. A variety of criteria may be used to identify cases: e.g. diagnosis, registries and notifications, abstracts of clinical records, reporting of defects such as a dental record. The epidemiologic definition of a case is not necessarily the same as the ordinary clinical definition.

Case Definition: A set of diagnostic criteria that must be fulfilled in order to identify a person as a case of a particular disease. Case definition can be based on clinical, laboratory or combined clinical and laboratory criteria or a scoring system with points for each criterion that matches the features of the disease. If the diagnosis is based on a scoring system e.g. Multiple Sclerosis, it is important to abide by the system for surveillance purposes and when deciding whether to include or exclude cases in an epidemiologic study.

Cleaning: The physical removal of foreign material e.g. dusts, soil, organic material such as blood, secretions, excretions and microorganisms using mechanical and/or chemical means. Cleaning physically removes rather than kills microorganisms.

Cohort: Two or more patients/residents/clients colonized or infected with the same organism that are separated physically, in a separate room or ward, from other patients who are not colonized or infected with that organism

Cohort HCPsing: The practice of assigning specified personnel to care only for patients/residents known to be colonized or infected with the same organism. Such personnel would not participate in the care of patients/residents/clients who are not colonized or infected with that organism

Contact Precautions: Interventions to reduce the risk of transmission of microorganisms through direct or indirect contact. Contact Precautions include the use of gloves and gowns when giving direct care to patients/residents/clients or when in contact with their environment.

Diarrhea: Stool that is of the consistency that it takes the shape of the container it is placed into.

Drug Identification number (DIN): In Canada, disinfectants are regulated under the Food and Drugs Act and Regulations. Disinfectants must have a drug identification number (DIN) from Health Canada prior to marketing. This ensures that labeling and supportive data have been provided and that it has been established by the Therapeutic Products Directorate (TPD) that the product is effective and safe for its intended use.
**Disinfection**: The inactivation of disease-producing microorganisms. Disinfection does not destroy bacterial spores. Disinfection usually involves chemicals, heat or ultraviolet light.

**Droplet precautions**: Interventions to reduce the risk of transmission of microorganisms via respiratory droplets. Droplet precautions include the use of a surgical mask and eye/face protection whenever one is within 2 meters of the patient/resident.

**Environmental Health Officer** (EHO) (Public Health Inspectors): Enforces the BC Public Health legislation in regard to disease control and protection of the public. Works with the MHO in conjunction with the facility ICP management and HCP to ensure that appropriate outbreak mitigation measures will be put into place in the event of an outbreak. Acts as a consultant and provides support/resources prior to and during an outbreak; communicates/liaises promptly with Infection Control and/or the MHO when outbreaks are suspected and/or have been declared. Provides expertise in determining the source and means of spread of the agent, especially where food or waterborne spread may be involved.

**Hand Hygiene**: A process for the removal of soil and transient microorganisms from the hands. Hand hygiene may be accomplished using soap and running water or by the use of alcohol-based hand rubs. Optimal strength of alcohol-based hand rubs should be 60% to 90% alcohol. Hand washing is required whenever hands are visibly soiled. Alcohol based hand rubs have limited effect on non-enveloped viruses (depending upon concentration) and spore forming bacteria (e.g. *C. difficile*).

**Health Care Provider**: Individual providing or supporting health care services that will bring them into contact with patients/clients/residents. This includes, but is not limited to: emergency service providers, physicians, dentists, chiropractors, nurses, podiatrists, respiratory therapists and other allied health professionals, students, support services (e.g. housekeeping, dietary, maintenance, hairdressers), and volunteers.

**Hospital-grade Disinfectant**: A disinfectant that has a drug identification number (DIN) from Health Canada indicating its approval for use in Canadian hospitals

**Infection Prevention and Control Professional** (ICP): Trained individual responsible for a health care setting’s infection prevention and control activities.

**Isolation**: The physical separation of infected individuals from those uninfected for the period of communicability of a particular disease

**Medical Health Officer** (MHO): a medical practitioner with training, knowledge, skills and experience in community medicine who is designated to this position, for a geographical area, by the Lieutenant Governor of BC under the Public Health Act. The MHO provides advice and direction on public health issues including health promotion and health protection and their related practices, bylaws and policies. The MHO reports to the public those matters which are deemed to be in the public interest.
**Occupational Health:** the specialized practice of medicine, public health and ancillary health professions in an occupational setting. Its aims are to promote health as well as to prevent occupationally related diseases and injuries and the impairments arising there from, and when work related illness or injury occurs to treat these conditions.

**Personal Protective Equipment (PPE):** Clothing or equipment worn by individuals for protection against hazards such as blood, body fluids, and infectious secretions.

**Public Health Nurse:** Public Health nurses care for the physical and mental health needs of the community as a whole. They may work with families in the home, with community groups, in schools, in government agencies and at workplaces.

**Residential Care Facility:** Residential care facilities provide 24-hour professional nursing care and supervision in a protective, supportive environment for people who have complex care needs and can no longer be cared for in their own homes.

**Routine Practices:** Routine practices is the term used by Health Canada/Public Health Agency of Canada to describe the system of infection prevention and control practices recommended in Canada to be used with all clients/patients/residents during all care to prevent and control transmission of microorganisms in health care settings.

**Surveillance:** Systematic, ongoing collection, collation, and analysis of health-related information that is communicated in a timely manner to all who need to know which health problems require action. Surveillance is a central feature of epidemiological practice, where it is used to control disease. Information that is used for surveillance comes from many sources, including reported cases of communicable diseases, hospital admissions, laboratory reports, cancer registries, population surveys, reports of absence from school or work, and reported causes of death.
Appendix 1: Public Health Agency of Canada, Rating Scale for Strength and Quality of Evidence

**Categories for strength of each recommendation**

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>DEFINITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Good evidence to support a recommendation for or against use</td>
</tr>
<tr>
<td>B</td>
<td>Moderate evidence to support a recommendation for or against use</td>
</tr>
<tr>
<td>C</td>
<td>Insufficient evidence to support a recommendation for or against use</td>
</tr>
</tbody>
</table>

**Categories for quality of evidence**

<table>
<thead>
<tr>
<th>GRADE 1</th>
<th>DEFINITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Evidence from at least one properly randomized controlled trial</td>
</tr>
<tr>
<td>II</td>
<td>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</td>
</tr>
<tr>
<td>III</td>
<td>Evidence from opinions of respected authorities on the basis of clinical experience, descriptive studies, or reports of expert committees.</td>
</tr>
</tbody>
</table>
## Appendix 2: Agents that are Common in Gastrointestinal Infection Outbreaks (44, 45)

<table>
<thead>
<tr>
<th>Agent</th>
<th>Reservoir</th>
<th>Incubation Period</th>
<th>Symptoms</th>
<th>Duration of Symptoms</th>
<th>Period of Communicability</th>
<th>Person to Person Transmission</th>
<th>Type of Precautions and duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calicivirus such as</td>
<td>Humans are the only known reservoir</td>
<td>Usually 24-48 hours (range-10-50 hours)</td>
<td>Self limited mild to moderate vomiting and diarrhea</td>
<td>24-48 hours</td>
<td>During acute symptoms and up to 48 hours after symptoms resolve</td>
<td>yes</td>
<td>Contact until asymptomatic for 48 hours. Use a surgical mask with eye/facial protection in specific situations(see page 14).</td>
</tr>
<tr>
<td>Rotavirus</td>
<td>Probably humans</td>
<td>24-72 hours</td>
<td>Abrupt onset of vomiting and diarrhea and rapid dehydration, low grade fever</td>
<td>4-6 days</td>
<td>During acute symptoms, not usually after 8 days post infection</td>
<td>yes</td>
<td>Contact until asymptomatic for 48 hours. Use a surgical mask with eye/facial protection in specific situations (see page 14).</td>
</tr>
<tr>
<td>Adenovirus</td>
<td>Humans</td>
<td>3-10 days</td>
<td>Abrupt onset of vomiting and diarrhea and rapid dehydration, low grade fever</td>
<td>4-6 days</td>
<td>During acute symptoms and up to 14 days after onset</td>
<td>yes</td>
<td>Contact and use a surgical mask with eye/facial protection in specific situations (see page 14) until asymptomatic for 48 hours or longer if poor hygiene or continence issues (consult MHO).</td>
</tr>
<tr>
<td>Campylobacter species (bacteria)</td>
<td>Animals, mostly raw poultry; pets (range 1-10 days)</td>
<td>Usually 2-5 days</td>
<td>Diarrhea, abdominal pain, malaise, fever, nausea and vomiting</td>
<td>2-5 days</td>
<td>Throughout infection, from several days to weeks if not treated</td>
<td>Low communicability but may be possible in food handlers or if individual faecally incontinent and has poor hygiene</td>
<td>Routine</td>
</tr>
<tr>
<td>Agent</td>
<td>Reservoir</td>
<td>Incubation Period</td>
<td>Symptoms</td>
<td>Duration of Symptoms</td>
<td>Period of Communicability</td>
<td>Person to Person Transmission</td>
<td>Type of Precautions and duration</td>
</tr>
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</tr>
<tr>
<td><em>Clostridium difficile</em> (bacteria)</td>
<td>Humans some animals</td>
<td>unknown</td>
<td>Mild to severe diarrhea capable of causing bowel perforation</td>
<td>Several days to months</td>
<td>While symptoms persist</td>
<td>yes</td>
<td>Contact precautions until normal stools for 48 hours</td>
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<td></td>
<td>Please refer to the PIDAC Guidelines for C. difficile</td>
</tr>
<tr>
<td><em>Clostridium perfringens</em> (bacteria)</td>
<td>Soil; GI tract of healthy people and animals (cattle, fish, pigs, poultry)</td>
<td>Usually 10-12 hours (range= 6-24 hours)</td>
<td>Mild disease of short duration; sudden onset abdominal cramping and diarrhea; vomiting and fever usually absent</td>
<td>1 day or less</td>
<td>N/A</td>
<td>no</td>
<td>Routine</td>
</tr>
<tr>
<td><em>E. coli</em> O157:H7 (bacteria)</td>
<td>Agricultural animals especially cattle, goats, sheep and humans</td>
<td>2-8 days</td>
<td>Range from mild non-bloody diarrhea to feces that are virtually all blood. Hemolytic uremic syndrome in 2-7% of cases</td>
<td>Typically less than a week, usually longer in children</td>
<td>1 week in adults; up to 3 weeks in children</td>
<td>yes</td>
<td>Contact for 1-3 weeks depending upon age, ability to control excretions and hygiene</td>
</tr>
<tr>
<td><em>Salmonella</em> (bacteria)</td>
<td>Domestic and wild animals and humans</td>
<td>Usually 6-12 hours (range= 6-72 hours)</td>
<td>Sudden onset headache, abdominal pain, diarrhea, nausea and sometimes vomiting. Usually</td>
<td>Several days to several weeks Can become a chronic carrier</td>
<td>Throughout course of infection</td>
<td>yes</td>
<td>Contact until asymptomatic for 48 hours or longer if poor hygiene, continence issues or if person is employed as a</td>
</tr>
<tr>
<td>Agent</td>
<td>Reservoir</td>
<td>Incubation Period</td>
<td>Symptoms</td>
<td>Duration of Symptoms</td>
<td>Period of Communicability</td>
<td>Person to Person Transmission</td>
<td>Type of Precautions and duration</td>
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</tr>
</tbody>
</table>
| *Salmonella* Typhi and Paratyphi (bacteria) | Humans | *S.* Typhi 5-28 days  
*S.* Paratyphi 1-10 days | Often begins with fever, Abdominal pain, later diarrhea, Multiple side effects | *S.* Typhi can become a chronic infection, especially if treated with incorrect antibiotic | Primarily while GI symptoms are occurring | yes  
Food borne spread is usually via infected food handlers.  
Generally low communicability | Contact while symptoms last |
| *Shigella* species (bacteria) | Humans | 1-3 days | Diarrhea accompanied by fever, vomiting and cramps. | 4-7 days | During acute symptoms and up to 4 weeks after illness | yes  
Contact until asymptomatic for 48 hours or longer if poor hygiene or continence issues or if person is employed as a food handler (consult MHO) |
| *S. aureus* enterotoxigenic (bacteria) | Humans  
sometimes cows, dogs, and fowl  
(range= 30 min.-8 hours) | Usually 2-4 hours | Abrupt onset nausea, cramps, vomiting and sometimes diarrhea | 1-2 days | N/A | no  
Routine |
Appendix 3: Quick Reference Checklist

This list is an example and meant to be modified and/or re-organized to meet individual facility needs.

Case Definition
A case of GI infection is defined as any one of the following conditions that cannot be attributed to another cause (e.g.: laxative use, medication side effect, diet, prior medical condition):

- Two or more episodes of diarrhea in a 24 hour period – above what is considered normal for that individual
  OR
- Two or more episodes of vomiting in a 24 hours period
  OR
- One episode each of vomiting and diarrhea in a 24 hours period
  OR
- Positive culture for a known enteric pathogen with a symptom of GI infection (e.g. vomiting, abdominal pain, diarrhea)
  OR
- One episode of bloody diarrhea

Outbreak Definition
Three or more cases of GI infection that are potentially related occur within a four day period, in a specific geographic area (i.e. unit, ward).

Report
- Report outbreak to the MHO or delegate
- Notify appropriate Managers and Patient Care Leaders
- Outbreak Prevention and Management Team should meet as soon as possible.
- Notify service providers such as HandyDART, oxygen services, laboratory services, BC Ambulance, etc. of outbreak and control measures required
- Notify any facility that admitted a patient/resident/client from the outbreak area within the past 72 hours
- Complete line listing of ill patients/residents/clients (see page 32)
- Complete line listing of ill HCPs (discuss with person responsible for occupational health), where this information is available (see page 31)
Discuss with MHO or delegate the need to:
• Postpone transfers to other units or facilities, admissions or re-admissions unless medically warranted. Depending upon the physical layout of the building and the extent of the outbreak, restrictions may apply to one wing or one unit, one floor or the entire facility.
• Decrease or discontinue group activities and outings until the outbreak is resolved
• Restrictions on visitors

Collect
• Collect and send specimens as outlined on page 12

Establish Outbreak Control Measures
• Wherever possible, confine ill patients/residents to rooms until 48 hours post symptoms
• As much as possible, assign the same HCPs to take care of ill clients over the duration of the outbreak.
• Post outbreak signage and ABHR at each entrance to unit/facility
• Reinforce hand hygiene practices with all HCPs
• Ensure everyone has easy access to hand hygiene stations (e.g. soap and water, ABHR)
• HCPs to use Contact Precautions when caring for ill individuals.
• When caring for individuals who are actively vomiting or when cleaning up areas grossly contaminated by vomitus or feces use droplet precautions in addition to Contact Precautions.
• Advise all visitors of outbreak, emphasize hand hygiene upon entering and exiting site
• Remind visitors not to enter the facility if they have vomiting and/or diarrhea
• Ensure all visitors wear personal protective equipment as recommended by the HCPs
• Visitors should only visit one patient/resident/client and not travel from room to room during visit
• Increase cleaning and disinfection procedures for washrooms, common areas and all frequently touched surfaces.
• Ensure soiled laundry is handled as little as possible, with minimum agitation and transported in closed bags
• Whenever possible dedicate equipment to be used only on that patient/resident/client. In the event that equipment must be shared it requires thorough cleaning and disinfection in between patients/residents/clients.

Ongoing surveillance
• Management and HCPs should maintain a watch for GI symptoms in patients/residents/clients and report any new onset to patient/resident/client care leaders
• HCPs should self monitor for GI symptoms and report illness to supervisor. HCPs who are ill must remain away from work until symptom free for 48 hours, regardless of whether they feel well enough to work.
• HCPs returning after illness must be meticulous and consistent with hand hygiene
• Communicate status of outbreak daily to Outbreak Prevention and Management Team please see page 33
Appendix 4: Initial Outbreak Report Form  (example)

<table>
<thead>
<tr>
<th>Brief Description of Outbreak</th>
<th>Date: _________________</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location: ____________________</td>
<td>Date of index case: _________________</td>
</tr>
<tr>
<td>Predominant symptoms: __________________</td>
<td></td>
</tr>
<tr>
<td>Progression to others: __________________</td>
<td></td>
</tr>
</tbody>
</table>

**Actions Taken**

- Date and time reported to MHO: _________________
- Activation of Outbreak Management Team: _________________
- Notification of external service providers (e.g. BC Ambulance, Medigas):
  - _________________

  “Just in time” in-services to HCPs:
  - _________________

  Cohorting of patients/residents and/or HCPs:
  - _________________

  Enhanced cleaning: _________________

  Restriction (visitors, HCP, unit closure):
  - _________________

  Extra hand hygiene stations/signage: _________________

  Specimens sent: _________________

**Current Status:**

- Number of symptomatic patients/residents: ______  Number of symptomatic HCP: ______
- Name of Reporting Person: ____________________________

*Adapted from forms submitted by Northern Health and Vancouver Coastal Health*
Appendix 5: Gastrointestinal Disease Outbreak Kit – Order Form

<table>
<thead>
<tr>
<th>SAMPLE CONTAINERS</th>
<th>COMPLETE KIT</th>
<th>REQUISITIONS ONLY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BLOOD TUBE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blood parasites</td>
<td>PARA</td>
<td></td>
</tr>
<tr>
<td>Hepatitis C PCR</td>
<td>VI</td>
<td></td>
</tr>
<tr>
<td>SST Gold Top tube for serology screening</td>
<td>SER</td>
<td></td>
</tr>
<tr>
<td>Zoonotic diseases &amp; emerging pathogens</td>
<td>ZEP</td>
<td></td>
</tr>
<tr>
<td><strong>FECES VIAS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enteric pathogens</td>
<td>BAM</td>
<td></td>
</tr>
<tr>
<td>Viral</td>
<td>VI</td>
<td></td>
</tr>
<tr>
<td>Parasite (n/a)</td>
<td>PARA</td>
<td></td>
</tr>
<tr>
<td><strong>SLIDES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Microscopic examination</td>
<td>BAM</td>
<td></td>
</tr>
<tr>
<td>Syphilis</td>
<td>ZEP</td>
<td></td>
</tr>
<tr>
<td><strong>SWABS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Viral isolation swab</td>
<td>VI</td>
<td></td>
</tr>
<tr>
<td>Influenza-like illness outbreak kit (if swabbed) for facility testing only</td>
<td>ILL FORM</td>
<td></td>
</tr>
<tr>
<td>Plastic cotton swab (in Asbestos Charcoal Transport media)</td>
<td>BAM</td>
<td></td>
</tr>
<tr>
<td>Puretubes kit (in Asbestos Charcoal Transport media)</td>
<td>BAM</td>
<td></td>
</tr>
<tr>
<td>Chlamydia trachomatis (DNA)</td>
<td>BAM</td>
<td></td>
</tr>
<tr>
<td>Chlamydia trachomatis &amp; R. gastroenterica swab</td>
<td>BAM</td>
<td></td>
</tr>
<tr>
<td>Chlamydia trachomatis &amp; R. gastroenterica UHIE TRANSPORT for nucleic acid testing (NAT)</td>
<td>BAM</td>
<td></td>
</tr>
<tr>
<td><strong>VIALS &amp; JARS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zoonotic diseases &amp; emerging pathogens</td>
<td>ZEP</td>
<td></td>
</tr>
<tr>
<td>Tissue parasites</td>
<td>PARA</td>
<td></td>
</tr>
<tr>
<td>Tuberculosis plastic vial</td>
<td>TB</td>
<td></td>
</tr>
<tr>
<td>Tuberculosis treated glass vial</td>
<td>TB</td>
<td></td>
</tr>
<tr>
<td>Food microbiology JAR</td>
<td>for Food Quality Sample</td>
<td>FQ</td>
</tr>
<tr>
<td>Food microbiology JAR</td>
<td>for Food Processing Sample</td>
<td>FP</td>
</tr>
<tr>
<td>Gastrointestinal disease outbreak kit</td>
<td>GIOB</td>
<td></td>
</tr>
<tr>
<td>Sterile glass jar</td>
<td>WB</td>
<td></td>
</tr>
<tr>
<td><strong>BOTTLES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Requisitions with no associated kits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zoonotic diseases &amp; emerging pathogens</td>
<td>ZEP</td>
<td></td>
</tr>
<tr>
<td><strong>BLOOD TUBES ONLY</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biohazard bags</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix 6: BCCDC Public Health Microbiology and Reference Laboratory Notification Form

![Gastrointestinal Disease Outbreak Notification Form]

**PHSA Laboratories**

Public Health Microbiology & Reference Laboratory

Fax to Environmental Microbiology at (604) 707-2607

It is important to complete all information requested. Incomplete forms may result in testing delay. *See reverse for Instructions*

**OUTBREAK IDENTIFICATION:**

Outbreak ID is specific to the event facility/hospital was followed by the year (e.g. Boardwalk Place 2009)

<table>
<thead>
<tr>
<th>CONTACT NAME:</th>
<th>CONTACT TELEPHONE:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>HA &amp; AREA:</th>
<th>Other, specify</th>
</tr>
</thead>
</table>

| RESULTS: | The person listed as the contact will be notified of lab results by telephone. Public Health will continue to receive lab reports. |

**LOCATION OF OUTBREAK**

<table>
<thead>
<tr>
<th>NAME OF INSTITUTION/EVENT/SOURCE:</th>
<th>ADDRESS:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>CITY:</th>
<th>POSTAL CODE:</th>
</tr>
</thead>
</table>

| TELEPHONE: | |

**OUTBREAK SETTING**

- Residential Care
- Hospital/Acute Care
- Child Care/Pre-School
- School/University
- Correctional
- Restaurant/Food Establishment
- Cruise Ship
- Conference/Meeting/Hotel
- Private Function
- Camp
- Other:

**OUTBREAK SUB-SETTING**

- Residential Care:
  - Acute Care
  - Extended Care
  - Private Hospital
  - Residential Lining
  - Other:

- Child Care Centers (Age of Children):
  - 0 - 3 months
  - 3 - 5 years
  - Above Age

**OUTBREAK DESCRIPTION**

**CASE HISTORY**

<table>
<thead>
<tr>
<th>ONSET DATE OF FIRST CASE:</th>
<th>(DD/MM/YYYY)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>NUMBER OF PATIENTS/RESIDENTS:</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>TOTAL NUMBER OF PATIENTS/RESIDENTS:</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>TOTAL NUMBER OF STAFF ILL:</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>TOTAL NUMBER OF ILL (APPROX):</th>
<th></th>
</tr>
</thead>
</table>

**SIGNS / SYMPTOMS**

(MUST be completed for appropriate testing)

<table>
<thead>
<tr>
<th>Diarrhea</th>
<th>Watery</th>
<th>Bloody</th>
<th>Persistent</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Vomiting</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Abdominal cramps</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Fever</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Other, specify</th>
<th></th>
</tr>
</thead>
</table>

**MODE OF TRANSMISSION**

- Food
- Water
- Person to person
- Unknown
- Others, specify

**SAMPLE DETAILS (if available)**

| 1. |
| 2. |
| 3. |
| 4. |
| 5. |
| 6. |

**PHSA LABORATORIES USE ONLY**

1. Test results telephoned to: ________________________ Time and date of call: ________________________ Lab: ________________________ Personnel Initial: ________________________

2. Test results telephoned to: ________________________ Time and date of call: ________________________ Lab: ________________________ Personnel Initial: ________________________

For information on sample collection, please call Environmental Microbiology Lab at (604) 707-2611

Form DCP-102-0001T Version 1.0 2009
Appendix 7: BCCDC Public Health and Microbiology Reference Laboratory GI Disease Outbreak Requisition Form (8)
Appendix 8: The Four Basic Elements of Routine Practice

Hand Hygiene
Hand hygiene is everybody’s responsibility: HCPs, clients, visitors and volunteers. Hand hygiene is the most effective way to prevent the transmission of microorganisms. Compliance with hand hygiene recommendations requires continuous reinforcement.

- Either alcohol based hand rub (ABHR) or soap and warm water are accepted methods of hand hygiene.
  - soap and water is required if hands are visibly soiled
  - ABHR is recommended at “point of care” places in patient care areas

- Patients/residents/clients who are able to participate in self-care should be taught, encouraged and reminded of the importance of hand hygiene before eating or preparing food, after using the toilet or other personal hygiene activities, before leaving their homes for common/public areas and when returning home from public places.

Risk Assessment
A Risk Assessment is the evaluation of the interaction between the Health Care Provider (HCP), the patient/resident/client and the environment to determine the potential for exposure to pathogens. Prior to any patient/resident/client interaction all HCP have a responsibility to always assess the infectious risk posed to themselves and to others (e.g. other patients/residents/clients, visitors, other HCP).

Risk Assessments for any interaction includes:

- The patient/resident/client’s symptoms and whether they may be consistent with an infectious process
- The type of interaction will occur (e.g. direct care vs. bringing something into the room for them)
- The potential for contamination of themselves or any equipment used
- Identification of barriers (e.g. PPE) required to prevent transmission
- Whether all secretion/excretions are contained (e.g. continence, wounds well covered)
- Whether the person is able to follow instructions (e.g. cognitive abilities, mental health condition)
- The setting in which the interaction will take place (e.g. single room vs. multi-bed room, vs. outpatient or common area)

In reality, HCP do Risk Assessments many times a day for their safety and the safety of others in the healthcare environment. During a GI infection outbreak PCA should be especially vigilant in identifying risk of exposure to GI pathogens, especially when assisting those who are ill (e.g. actively vomiting).
**Risk Reduction Strategies**
Risk reduction strategies include: engineering measures (e.g. negative pressure rooms) client screening, using personal protective equipment (PPE), cleaning of environment, equipment, and laundry, using “single use” only equipment or ensuring proper disinfection and sterilization of reusable equipment, appropriate waste management and safe sharps handling, client placement and using preventative workplace practices such as HCPs immunization policies.

**Education of Health Care Providers, Clients and Families/Visitors/Volunteers**
All health care providers should receive general education on agency policies, which includes information regarding the principles of infection prevention and control. Review of hand hygiene; Routine Practices and additional precautions; and chain of infection should be included and refreshed at intervals. Specific information should be emphasized, as it relates to the work environment.

Education for clients should include specific information about their general condition (usually this is provided by the attending physician), and specific information concerning any infection. If the client has an infection, this information should include practices necessary to reduce the risk of spread. The health care provider should provide education for the client and family as appropriate for the presenting condition.
### Appendix 9: GI Outbreak Surveillance Form - Patients/Residents/Clients (example)

<table>
<thead>
<tr>
<th>Patient/Resident/Client Information</th>
<th>Clinical Presentation</th>
<th>Specimen(s) sent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Date of birth y/m/d</td>
<td>Unit</td>
</tr>
</tbody>
</table>

**SYMPTOMS:**

- V=Vomiting
- D=Diarrhea
- C=Cramps
- N=Nausea
- F=Fever
- H=Headache
- A=Abdominal Pain
- M=Myalgia

**ROOM TYPE:**
P=Private
S=Semi-private
M=Multi-bed

*Adapted from forms submitted by Northern Health and Vancouver Island Health Authority*
## Appendix 10: GI Outbreak Surveillance Form – HCPs (example)

<table>
<thead>
<tr>
<th>HCPs Information</th>
<th>Clinical Presentation</th>
<th>Specimen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>DOB y/m/d</td>
<td>Occupation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unit(s) worked</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Date of symptom onset</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Onset at work?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Symptoms (see below)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Date of symptom resolution</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Collection Date/date submitted</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Result</td>
</tr>
</tbody>
</table>

**SYMPTOMS:** V=Vomiting  D=Diarrhea  C=Cramps  N=Nausea  F=Fever  H=Headache  A=Abdominal Pain  M=Myalgia

*Adapted from forms submitted by Northern Health and Vancouver Island Health*
### Appendix 11: Disinfectants Commonly Used in GI Outbreaks (33, 35, 37, 39, 46, 47)

<table>
<thead>
<tr>
<th>Agent and Concentration</th>
<th>Uses</th>
<th>Active Against</th>
<th>Properties/Cautions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chlorine:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Household bleach (5.25%)</td>
<td>Used for disinfecting general household surfaces. (make fresh daily)</td>
<td>Vegetative bacteria (<em>Salmonella, E. coli</em>), Enveloped viruses (Hepatitis B and C)</td>
<td>All organic matter must be cleaned from surface first</td>
</tr>
<tr>
<td>1:100 (500 ppm solution)</td>
<td>10 ml bleach to 990 ml water</td>
<td></td>
<td>Make fresh daily as shelf life shortens when diluted</td>
</tr>
<tr>
<td>1:50 (1,000 ppm solution)</td>
<td>20 ml bleach to 980 ml water</td>
<td></td>
<td>Store in closed containers which do not allow light to pass through away from light and heat</td>
</tr>
<tr>
<td>1:10 (5,000 ppm solution)</td>
<td>100 ml bleach to 900 ml water</td>
<td></td>
<td>Irritant to skin and mucous membranes</td>
</tr>
<tr>
<td><strong>Accelerated hydrogen Peroxide 0.5%</strong></td>
<td>Used for disinfecting general surfaces and surfaces contaminated with body fluids and waste</td>
<td>Bacteria Enveloped viruses Non-enveloped virus (norovirus)</td>
<td>Active in the presence of organic matter</td>
</tr>
<tr>
<td></td>
<td>5 minute contact time at 20°C</td>
<td></td>
<td>Good cleaning ability due to detergent properties</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Non-toxic</td>
</tr>
</tbody>
</table>

*NEVER* mix with any other cleaning solution.
| **Accelerated hydrogen Peroxide 4.5%** | Use for cleaning and disinfecting toilet bowls, sinks, basins, commodes  
Sporicidal efficacy in 10 minutes | Sporicidal, use when *C. difficile* is suspected |
| **Quaternary Ammonium Compounds (QUAT)** | Use for general cleaning of floors, walls, furnishings  
Allow surfaces to air dry naturally | Vegetative bacteria  
Enveloped viruses  
Some fungi | Good cleaning ability as usually has detergent properties  
Non-corrosive  
Do NOT use to disinfect instruments  
Many preparations have limited effectiveness against common organisms that cause GI infections (e.g. norovirus).  
Use in well-ventilated areas  
Always check for DIN number and manufactures list of indications |

**VERY IMPORTANT:**
* Ensure product has a DIN number.  
* Check manufacturers information to ensure that product is effective against organisms in question.  
* Follow product instructions for dilution and contact time  
* Unless otherwise stated on the product, use a detergent to clean surface of all visible debris prior to application of disinfectant.  
* Alcohol may be used on some small equipment such as stethoscopes but not as a general surface disinfectant
Appendix 12: Cleaning Up Vomitus and Feces

- Attend to the patient/resident/client first, if necessary.
- Isolate the area, if possible, and place a wet floor sign/flag to prevent slipping.
- Wear disposable gloves or household rubber gloves (these will need to be disposed or decontaminated after) as well as other personal protective equipment (surgical mask, eye protection, gloves, gown or apron).
- Gross soiled material must be removed prior to cleaning and disinfecting. Wipe up excrement using absorbent disposable material (e.g. paper towels). Use a wipe up technique that does not agitate excrement and place directly into a regular garbage bag.
- Clean the surface with neutral detergent to remove any trace residual dirt or body fluids.
- Disinfect the area to a radius of 2 meters with an accelerated hydrogen peroxide 0.5% ensuring a 5 minute contact time or a fresh 1/50 dilution of household bleach 5.25% (e.g. 20 ml bleach to 980 ml water) and allow to air dry naturally. **NB. ensure that area is very well ventilated.**
- Discard waste including gloves into regular garbage immediately.
- If the area involved was so large that a mop had to be used, wash the mop head, soak in disinfectant and place into a leak proof laundry bag when finished. The bucket contents should be carefully poured into the available sewage outlet (i.e. hopper, utility sink), and the bucket rinsed and wiped with the disinfectant.
- Remove personal protective equipment and discard in regular garbage.
- Perform hand hygiene at the end of the procedure.
- If a vomiting or fecal accident occurs in an area where food is prepared served or displayed or stored, dispose of any food that has been handled by the ill person since symptom onset, or been present within 2 meters of a vomiting incident.
- Wash all dishes, utensils and trays in hot water and detergent (minimum of 74° for 10 seconds). Be careful not to cross-contaminate dirty and clean dishes.
Appendix 13: Daily Update Outbreak Report for OPMT (example)

Location: ________________________________

Date: ___________________________ Day _____ of Outbreak

Number of new cases today - Patients/Residents/Clients: ________________

Number of new cases today – HCPs: __________

Date of symptom onset of last case: __________

Number of patients/residents currently symptomatic: ________________
(include new cases)

Number of patients/residents recovered: ________________

New developments/concerns:

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

Further actions required:

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

Adapted from forms submitted by Northern Health, Fraser Health and Vancouver Coastal Health
Appendix 14: Outbreak Communication Memo  (example)

From: Date:

To: All units/ departments/ancillary services

An outbreak of gastroenteritis has been declared today (date), ____ on unit ____

The unit is reporting _____ (specify number of ill patients/ number of total unit patients) patients ill with new symptoms of vomiting and/or diarrhea since ____________ (specify date)

Actions taken

- Contact Precautions have been implemented on all symptomatic patients
- Additional hand hygiene stations have been set up at the point of entry to the unit
- Fact sheet on Viral Gastroenteritis is available at the hand hygiene station and nursing station
- Signage is posted at the point of entry to ____ (unit)
- Specimens are being collected/ sent to BCCDC to identify the organism
- Symptomatic patients will remain in their rooms unless medically warranted
- ____ (unit) will notify Infection Control of all new cases
- Visitor restrictions are in place on the affected unit
- Restriction on transfers/admissions of patients to _____ (unit) until further notice
- Patients will be cohorted where ever possible
- Cohorting of HCPs is in place; if possible.
- All HCPs and visitors are reminded to practice meticulous hand hygiene before and after contact with each patient and to use masks, protective eyewear, gloves and gowns appropriately
- Housekeeping have been notified to implement “Enhanced Cleaning”
- Healthcare provider exclusion: During an outbreak, Occupational Health will provide direction to HCPs presenting with signs & symptoms of gastroenteritis.
- Treatment: no specific therapy exists for viral gastroenteritis. Symptomatic therapy consists of replacing fluid losses and correcting electrolyte disturbances through oral and intravenous fluid administration

Adapted from Fraser Health Authority Outbreak Communication Memo
Appendix 15: Sign for Entrance (example)

ATTENTION VISITORS!!!

We presently have a number of ill residents/patients. You may wish to reconsider visiting at this time.

Please let the staff know who you will be visiting and they will give you any other necessary instructions.

Please wash your hands or apply alcohol hand sanitizer to your hands before visiting and before leaving.

Thank you
Appendix 16: Outbreak Summary Report  (example)

Date of onset of outbreak: ___________     Date outbreak declared over:_______________

Microorganism identified: ____________________ Laboratory Confirmed? Yes ___ No ___

Number of specimens identified in: _______ Suspected source: _______________________

Number of patients/residents exposed: _____    Total number of cases (patients/residents): ______

Attach rate for patients/residents (# of exposed divided by # of cases, multiply by 100):________

Number of HCPs exposed: _______        Total number of cases (HCPs): ______

Attach rate for HCPs (# of exposed divided by # of cases, multiply by 100): ________

Number of cases requiring higher level of care: _______
(e.g. transfer to hospital, transfer to ICU)

Number of deaths: _______

Unusual situations: _____________________________________________________________

_____________________________________________________________________________
_____________________________________________________________________________

Adapted from forms submitted by Northern Health and Vancouver Coastal Health
References


