

Enteric Illness

Introduction and General Considerations

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This section provides a general overview of the communicable diseases that are primarily transmitted through food and water and affect the gastrointestinal system. The information in this introduction provides both general considerations and key concepts. Specific procedures and information are included within each disease chapter.

Objectives

1. Individuals with communicable enteric infections will be identified, investigated and managed in a timely manner.
2. Complications will be reduced or prevented through timely identification and implementation of control measures.
3. To offer information to the public as needed, related to safe food handling, food-borne and waterborne illness.
4. Isolated cases and outbreaks of enteric diseases will be prevented through public health measures such as water sampling and the provision of safe food handling courses.
5. Outbreaks will be contained through timely identification of the source and contacts and through the implementation of control measures. This may include making recommendations related to the closure of public facilities, withdrawing products from shelves, implementing boil water orders or precautionary drinking water advisories, exclusion of cases and/or contacts from settings where there is a high risk of transmission, etc.
6. Information will be managed in a confidential manner and will be shared in accordance with [Appendix B - Interjurisdictional Communication](#), *The Public Health Act, 1994* and *The Health Information Protection Act* and their respective regulations.
7. Information that is required for notification purposes will be entered in the electronic case management system to be used for surveillance purposes.



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Background

In Saskatchewan, enteric diseases comprise approximately one quarter of all reportable communicable diseases. This is only a small percentage of the infectious agents that cause enteric illnesses. Gastrointestinal tract infections caused by bacteria, viruses and parasites account for a greatly under-appreciated burden of illness and death both overseas and domestically. Symptoms that arise from enteric diseases range from mild gastroenteritis to severe dehydrating diarrhea and life-threatening systemic infections. A safe, healthy, sustainable environment is important to the health status of a population. A safe food and water supply contribute to a population's health. Management of water supplies and safe food handling are vital to ensure safe drinking water and food security for the population.

Reporting Requirements

See Reporting Requirements in the [General Information Introduction - Section 1](#) of the manual for guidelines. Refer to [Appendix A – Reporting and Follow-up Timelines](#).

Methods of Control

Primary Prevention

Many of the organisms that cause enteric illnesses are spread via food, water or other common vehicles. Transmission to others is also facilitated through poor personal hygiene practices of individuals. In general, the following measures are the best way to prevent contact with organisms that cause gastrointestinal illness.

Drinking Water Safety

Drinking water supplies should be sampled and tested on a regular basis. Samples are tested for a number of characteristics, however in the interest of communicable disease control, we are concerned about micro-organisms (bacteria and protozoa) such as *Giardia*, *Cryptosporidium*, *E. coli*, etc. found in drinking and recreational water, that pose risks to individuals' health.

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Public drinking water supplies are tested and sampled on a regular basis. Public water systems undergo regular, often daily, chlorine testing coupled with periodic (weekly or monthly) bacteriological monitoring. Public water supplies will typically be tested for coliform bacteria which are a useful indicator of contamination with soil and/or fecal material. Most routine coliform bacteriological samples will also test for *E. coli*. Sampling for viruses and protozoa is not typical however this sampling may be performed in the event of a treatment failure or during a suspected waterborne illness outbreak.

Legislation/Regulations for Public Water Systems

- Through *The Environmental Management and Protection Act, 2002* and the Water Regulations, 2002, Saskatchewan Ministry of Environment is responsible for ensuring sampling and testing of all municipal water supplies connected to a water distribution system (villages, towns, cities, etc.).
- Through *The Public Health Act, 1994* and the Health Hazards Regulations, Regional Health Authorities are responsible for sampling and testing all small public systems that are not regulated by the Saskatchewan Ministry of Environment. This would include rural municipality (RM) wells that are used for hauling water for private or public use.

Private water systems are not regulated. However, it is recommended that private water supplies be sampled and tested for bacteriological analysis at least annually unless there is reason to believe that the source has been contaminated through flooding or other means.

Bacteriological water sample containers and requisition forms are available through RM offices, public health offices and Saskatchewan Disease Control Laboratory for private water supplies. Health Regions can provide advice on water test results and treatment. Saskatchewan Watershed Authority operates various services to the public such as the Rural Water Quality Program.



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Protocols for First Nations Communities

- While existing regulations governing public water systems do not apply on reserves, when Chiefs and Councils sign their funding arrangements with Aboriginal Affairs and Northern Development Canada (AANDC) they agree to design, construct and operate these systems in accordance with AANDC's *"Protocol for Centralised Drinking Water Systems in First Nations"*. Health Canada funds monitoring services for the water distribution systems in First Nations and uses its *"Procedure Manual for Safe Drinking Water in First Nations Communities South of 60"* as a guide. The intent of AANDC's Protocol and Health Canada's Procedure Manual is to ensure that community drinking water supplies are safe.

Food Safety

Safe food is the responsibility of individuals, industry, local Public Health Authorities, the Government of Saskatchewan, federal agencies (Public Health Agency of Canada and Canadian Food Inspection Agency) and Health Canada. Some of the roles in food safety include ensuring proper handling and preparation, ensuring safe production and distribution, inspecting food establishments, providing public education on food safety, and setting food safety standards and policies.

The Food Safety programs in health jurisdictions work to reduce the risk of the public contracting a food-borne illness. Through public health officers,¹ the health jurisdictions monitor food establishments and conduct safe food handling courses. Public health officers investigate reports of food-borne illness and food-related complaints (Government of Saskatchewan, 2007).

One aspect of the Canadian Food Inspection Agency's (CFIA) mandate is to safeguard food. The CFIA is involved from the producer level through to the consumable product in order to protect public health. Products that may be subject to inspection certification by the CFIA range from agricultural inputs, such as seeds, feeds and fertilizers, to fresh, prepared and packaged foods.

¹ For the purpose of this document, this term is inclusive of Public Health Inspectors and Environmental Health Officers that provide similar functions in Saskatchewan.



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In carrying out its mandate in relation to food safety, the CFIA strives to:

- protect Canadians from preventable health risks;
- protect consumers through a fair and effective food, animal and plant regulatory regime;
- sustain the plant and animal resource base;
- contribute to the security of Canada's food supply and agricultural resource base;
- provide sound agency management.

Food safety in the home environment is the responsibility of private individuals. See [Attachment – Safe Food Handling Tips](#) for client education.

Hand Washing

Proper handwashing with soap and water is one of the most practical and effective ways of preventing the spread of disease (World Health Organization). See [Attachment – Hand Washing](#) for client education tips.

Recreational Water Safety

Recreational water can be divided into artificial bodies of waters such as swimming pools, which are governed by the Swimming Pool Regulations, and natural bodies such as lakes, rivers, and streams.

Public swimming pools in Saskatchewan are regulated under *The Swimming Pool Regulations, 1999* and are required to submit monthly bacteriological samples. In addition, swimming pools are required to maintain minimum disinfectant residuals and test for these and other chemical parameters on a daily basis. These values must be recorded in daily log books held at the facilities and must be made available to public health inspectors at the time of inspection. These records are a valuable reference in the event of suspected water-borne illnesses. Swimming Pool Operators courses are provided annually in most health regions across Saskatchewan. Swimming pool facilities are encouraged to certify as many employees as possible to promote knowledge of safe pool management.



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Whirlpools or hot tubs, both public and private, create unique challenges for maintaining bacteriological safety. The high temperatures combined with heavy bather loads, smaller volumes of water, and increased aeration lead to high disinfectant demands. If disinfectant levels are able to drop below the required minimum, bacteria can survive and multiply. Organisms such as *Pseudomonas aeruginosa* are especially adept to surviving in this type of environment due to the formation of a relatively chlorine resistant biofilm. Routine maintenance of this type of pool should involve complete draining, physical scrubbing of all surfaces, and focused disinfection of the recirculation system using strong chlorine or accelerated hydrogen peroxide solution.

A popular summertime activity, particularly for kids, is “fill and drain” paddling pools found in many communities across Saskatchewan. These pools lack recirculation systems and as such are filled with water in the morning, chlorinated, then drained at the end of the day. Fill and drain pools do require licenses to operate as public swimming pools and therefore are required to maintain a minimum disinfectant residual. Therefore, they are subject to the same disinfectant testing requirements. However, since operators are not typically present during the full day of operation and because bather loads are variable and unmonitored it is easy for the disinfectant residual to drop below the minimum. For these facilities it is especially important for the bathers to shower off after swimming and to avoid consuming any of the water.

Health regions may perform periodic sampling of bathing beaches. Testing is most often used to detect types of bacteria that indicate fecal contamination. More information on recreational water safety can be found in Health Canada’s *Guidelines for Canadian Recreational Water Quality*. The guidelines deal with health hazards associated with recreational water use, as well as aesthetic and nuisance conditions. Health hazards associated with direct contact with water include infections transmitted by pathogenic microorganisms, as well as injuries and illness due to physical and chemical properties of the water. The guidelines discuss the indicator organisms – enterococci, *Escherichia coli*, other fecal coliforms, and coliphages – as well as health risks related to exposure to waterborne pathogenic bacteria, viruses, protozoa, and toxic blue-green algae. Sampling of recreational waters is also addressed.



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Secondary Prevention

A team of public health members handles the follow-up of individuals with enteric diseases and enteric disease outbreaks. Information is collected from the infected individuals to determine exposures that may be related to common vehicle of transmission and for information regarding occupational/other settings where increased transmission could occur and is examined to identify trends in disease patterns and pockets of diseases. This is useful in determining additional measures that may be required and should be implemented to control the disease.

The specific level of intervention and contact tracing varies according to the disease and should be individualized based on the guidelines for the specific agent.

General Guidelines for Investigating Enteric Illnesses

These guidelines aim to assist in the collection of information and define control measures for enteric organisms. Refer to [General Information – Roles of Stakeholders](#) in Section 1 of the manual and [Appendix C – Major Legislation](#) for additional information that is applicable to Communicable Disease Control in Saskatchewan.

The following points and questions² can assist in determining the approach for follow up and help to prevent and control the disease.

1. What is the potential impact of the disease for the individual? Their household/family? Their community? Is this an outbreak?
2. What is the source of the disease? Can it be identified? Communication with the case is important to determine the **risk factors, exposures and potential exposures of others** to the disease.
3. Who else may have been exposed to the disease? When determining the possible source and possible contacts exposed, the **incubation period, mode of transmission** and **period of communicability** are important considerations.

² These questions were adapted from
<http://www.health.gov.nl.ca/health/publications/diseasecontrol/dcenterics.pdf>.



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Exposure period Incubation period Days before onset: Ask about exposures between these dates	Onset date and time	Contagious Period Period of communicability
Enter onset date and time in heavy box. Incorporate incubation period and period of communicability information for the identified organism to determine probable source exposure and transmission periods.		

Key considerations include:

- Recent exposure to someone else who is ill with similar symptoms.
- Travel history (local, interprovincial and/or international) – standards of hygiene vary with location and levels of economic development.
- Attendance in childcare, school, daycare, healthcare settings.
- Animals, especially pets such as dogs, cats, aquarium fish, reptiles, and farm animals. Pet treats may also serve as a source of infection or contamination.
- Occupation, involvement in community service.
- All food consumed, regardless of setting, within the incubation period for the organism (typically this is a 3-day food history):
 - obtain the name and location of all restaurants and other public eating establishments visited. Group meals attended (conferences, community meals/potlucks, family gatherings etc.) should also be inquired about.
- Water or ice consumed within the incubation period for the organism. Water sources could include public water sources, private water sources, beverages that are mixed with water, bottled water (brand name), natural water sources (e.g., river, stream, lake, pond), and recreational water sources (swimming pools, spas, lakes, etc.).



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4. Is there a high risk for transmission to others (e.g., highly communicable agent, etc.)? Determine if this individual is in a situation where there is a high risk of transmitting the organism (refer to [Special Considerations](#) below). Is exclusion of the case and contacts advisable (refer to [Exclusion of Infected Individuals](#) below)?
 5. Is there a population who is more likely to be susceptible to the infection? Are there people who are more likely to develop symptoms or serious manifestations of the infection (refer to [Special Considerations](#) below)?
 6. What interventions are available to prevent the transmission of the infection? Refer to disease specific measures and implement necessary activities.
 7. Who else may have been exposed to the disease? Conduct contact tracing to:
 - Determine if the contact is in a high-risk group.
 - Inform contacts of any prophylaxis and/or exclusion measures:
 - information that should be gathered from the contacts relates to their **level of risk, the need for testing, the potential benefit of prophylaxis** (as detailed in the disease sections specifically) and **immunization history**;
 - interventions such as **exclusion/isolation/quarantine** may be appropriate depending on the nature of the disease and the contacts that have been identified. See [Exclusion of Infected Individuals](#).
 8. Educate case and contacts regarding:
 - The nature of the disease including such aspects as the incubation period, period of communicability, mode of transmission, etc.
 - Self-care measures.
 - Personal protective measures should always include hand washing, not sharing personal items (e.g., dishware and drinking containers, towels, lip balms).
 - Disease control measures they must follow:
 - hand washing – see [Attachment – Hand Washing](#);
 - cleaning (kitchen and bathrooms);
 - safe sources of drinking water or appropriate measures to make drinking water safe;
 - avoiding consumption of hazardous foods;
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- food handling and storage – see [Attachment – Safe Food Handling Tips](#);
 - non-recommended sharing of toys, towels, eating utensils and food items;
 - publicly funded immunoprophylaxis or treatment may be indicated for certain diseases such as hepatitis A.
9. Obtain an immunization history from case and all appropriate contacts:
 - Immunizations should be offered to cases and contacts that are not up-to-date or who are eligible for vaccines as per the Saskatchewan Immunization Manual,³ Chapter 5: Immunization Schedules and Chapter 7: Immunization of Special Populations.
 - Depending on the organism and other circumstances, it may be prudent to offer immunization for the disease for both the case and the contact(s). Refer to disease section for details.
 10. Document case management and follow-up information on the electronic case management and surveillance system.
 11. Communication with other stakeholders (physicians, acute and long term care, schools, daycares, etc.) is vital for a coordinated and efficient response to a single communicable disease case or an outbreak. Of special note is the importance to maintain confidentiality according to the corresponding legislation.

Exclusion of Infected Individuals

If the individual case is in one of the high-risk groups (e.g., increased risk of transmission or an occupational setting with high-risk contacts), exclusion from work/child care or some other intervention may be warranted. It is the responsibility of the designated public health officer (medical health officer) to recommend the exclusion. Advise the medical health officer (MHO) and obtain the order in writing if voluntary compliance does not occur.

1. **Exclusion criteria are listed for each disease under the specific disease section of the manual.**
2. **Inform the cases/contacts of the need to comply with exclusion criteria.** The investigator will inform parent of children under the age of consent of the need for exclusion.

³ <https://publications.saskatchewan.ca/#/products/129354>



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3. **Work with case to inform place of employment/child-care center of the name of the disease and the exclusion criteria.** A balance must be maintained in protecting the health of the public and protecting the privacy of affected individuals. *The Public Health Act, 1994* and *The Health Information Protection Act* should be referred to guide disclosure of information.
 4. If voluntary compliance with exclusion is not obtained, the MHO may issue a written order for exclusion under *The Public Health Act, 1994*.
 5. Terms for return to work/child care are listed under the specific diseases.

Communication with Primary Care Provider (physician)

Ongoing communication is not always necessary; however certain aspects may need to be discussed such as:

1. **Case history and management details.**
2. **Client follow-up.**
3. **Specimen collection of cases or contacts.** If a special-risk index case is excluded from work/child care, the physician may work with the investigator and health region to facilitate the collection of stool specimens. See specific disease for details.
4. **Role of Public Health.**

Special Considerations

Certain individuals and certain environments may be considered higher-risk for transmission. The following sections outline some circumstances that may need to be considered when doing your investigation.

Food Industry Workers

Those involved in processing, preparing, handling, cooking, or serving food products. The investigator should specifically ensure Public Health Officers are involved if a food handler/food processor is diagnosed with an enteric disease.



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Health Care and Child Care Workers

Those who have direct contact, or contact through food preparation or food service, with susceptible vulnerable patients or persons in whom an intestinal infection would have serious consequences (e.g., immunocompromised persons, surgical and medical patients, the elderly, and infants).

Children below the Age of Five Years

Particularly those attending day care, play groups, schools, or other similar groups.

Individuals with Suboptimal Personal Hygiene Practices

Individuals with poor practices of personal hygiene (i.e., mentally or physically handicapped) may serve as a vehicle of transmission due to the lack of self-care measures that are useful in interrupting the chain of infection.

Public Eating Establishments

This includes the spectrum from restaurants, cafeterias, to temporary functions where food is served. This may be implicated as a common source.

Community Gatherings Where Food is Served

This may include such events as potlucks or catered meals.

Other Settings That May Not Have Adequate Water and Plumbing Facilities

Some examples of this may include work camps (temporary or permanent), summer camps, fishing camps or other events relying on temporary bathroom facilities (i.e., temporary mass gatherings).

Child Care Centres

Young children have limited ability to implement the individual measures to reduce the risk of spread of diseases. This provides an increased opportunity for transmission. This also necessitates early identification and diligent infection control practices. Refer to Saskatchewan Ministry of Health Infection Control Manual for Child Care Facilities.⁴ This serves as an excellent resource for daycare settings to assist in minimizing the risk and spread of communicable diseases.

⁴ <http://www.saskatchewan.ca/live/births-deaths-marriages-and-divorces/starting-a-family/early-learning-and-child-care/child-care>.



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Health Care Facilities and Institutional Settings

Health care facilities present as a high-risk environment for 2 reasons:

1. Typically the clients/patients within the facility are there because they either have a medical condition that puts them at greater risk for contracting an infection or they are already infected and experiencing complications of a communicable disease.
2. Health Care Workers serve as a vehicle for transmission of a communicable disease to a high-risk individual.

To avoid this, familiarity with and adherence to Infection Control Guidelines and Practices is of paramount importance.

If any of these facility settings are believed to be the initial source of the case, inform Public Health, if they are not already involved, so follow-up investigation of the facility can be done.



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