

VEROTOXIGENIC E. COLI

Case definition

CONFIRMED CASE

Laboratory confirmation of infection with or without clinical illness:

- isolation of verotoxin producing *E. coli* from an appropriate clinical specimen [i.e., feces, urine, blood]

OR

- detection of verotoxin antigen or nucleic acid.

PROBABLE CASE

Clinical illness in a person who is epidemiologically linked to a confirmed case, which would include persons with hemolytic uremic syndrome (HUS).

Causative agent

Escherichia coli have many serotypes that produce verotoxin-causing food-borne illness. The best known of these is *E. coli* O157:H7, a gram-negative bacterium. There are several other common serogroups in North America.

Source

- *E. coli* bacteria can sometimes contaminate the surface of meat when animals are slaughtered, despite precautions. In highly processed or ground meat, the mechanical process can spread the bacteria through the meat. Raw fruits and vegetables can become contaminated with pathogens while in the field, by improperly composted manure, contaminated water, wildlife and poor hygienic practices of workers.
- *E. coli* bacteria are most often spread from person to person. Both animals and people infected with the bacteria can be carriers. *E. coli* has been linked to ground beef, raw fruits and vegetables, including sprouts, untreated water, unpasteurized milk and milk products including raw cheese, unpasteurized apple juice/cider, contact with farm animals and petting zoos.
- Feces of cattle, deer and other ruminants.

Incubation

Most *E. coli* strains have an incubation period of 10 hours to 6 days. *E. coli* O157:H7 incubation period is usually 3–4 days [range 1-10 days].

Transmission

- Fecal-oral from person-to-person or animal-to-person—especially associated with farms, petting zoos and agricultural fairs.
- Ingestion of food or water contaminated by feces of an infected person or animal, especially undercooked ground beef, unpasteurized milk and milk products including raw milk cheese, juice or cider, untreated water, fruit and vegetables, including sprouts.

Communicability

1 week or less in adults, 3 weeks in one-third of children. Long-term carriers are uncommon.

Symptoms

Diarrhea often beginning as non-bloody progressing to visible or occult blood, severe abdominal pain, vomiting, fever in less than one-third of cases. Illness may be complicated by hemolytic uremic syndrome (HUS), thrombocytopenic purpura (TTP) or pulmonary edema. Asymptomatic infections may also occur and the microorganism may cause extra intestinal infections.

Diagnostic testing

Stool for culture.

Treatment

Fluid and electrolyte replacement when diarrhea is watery. Role of antibiotic treatment is uncertain, and some evidence suggests that treatment with trimethoprim/sulfamethoxazole (TMP-SMX) fluoroquinolones may precipitate complications such as hemolytic uremic syndrome.

PUBLIC HEALTH MANAGEMENT & RESPONSE

Case management

Follow up the case using the following steps:

1. Contact the primary care provider to obtain clinical information on the case.
2. Interview the case, review clinical information, determine food history and activities, employment, potential source of exposure and determine any contacts that may require investigation [see [Contact tracing](#) section].
3. Educate the case and/or family about verotoxigenic *E. coli* and prevention measures, providing access to website, general information, etc.
4. If drinking water or recreational water has been identified as a potential source, consult with the Medical Officer of Health (MOH) concerning initiating a request for assistance from Nova Scotia Environment. The MOH may request an inspection/investigation be conducted at the site to identify potential sources. This can be facilitated through the Environmental Health Consultant within the Department of Environment.
5. If the case identifies consuming natural spring water, provide the general information “Natural and Roadside Springs” from the Nova Scotia Environment website: gov.ns.ca/nse/water/docs/droponwaterfaq_naturalsprings.pdf as an education resource.
6. If the case identifies a local food establishment [including institutional settings] as a possible source, contact a Food Safety Specialist with the Department of Environment.
7. Implement the necessary exclusions as per the [Exclusion](#) section for those cases identifying as belonging to one or more risk group[s].
8. Document the information on the Enteric Case Report Form and the *Verotoxigenic E. coli* Case Report Form.

Exclusion

Exclude cases in the risk groups below:

Risk Group	Criteria for Exclusion
Food handlers	Until 2 negative stool samples have been obtained at least 24 hours apart AND at least 48 hours after discontinuance of antibiotics.
Health care, child care or other staff who have contact with susceptible persons	Until 2 negative stool samples have been obtained at least 24 hours apart AND at least 48 hours after discontinuance of antibiotics.
Children attending child care setting, etc.	Until 2 negative stool samples have been obtained at least 24 hours apart AND at least 48 hours after discontinuance of antibiotics.

Note: Ensure that all samples submitted to the laboratory for testing are labelled “Public Health management requirement to inform exclusion”.

Education of case

Offer the following information:

- Ensure cases belonging to a high risk group are aware of exclusion criteria.
- Provide information regarding the collection and submission of stool samples as required.
- Remind cases about the importance of hand hygiene in stopping the spread of *E. coli* and to wash hands before preparing food and after using the bathroom and changing diapers.
- Inform the case about the potential to infect contacts and provide information on how to minimize transmission to others; including household and close contacts, including sexual contacts.
- Recommend that cases infected with *E.coli* bacteria or any other gastrointestinal illness should not prepare or serve food to other people [for food handlers see [Exclusion](#) section].

See [General Information Sheet](#) for further information on preventing the transmission of *E. coli*.

Contact tracing

Contact tracing should be initiated as part of case management if symptomatic contacts or contacts that belong to any of the Risk Groups identified in the [Exclusion of contacts](#) section are identified by the case.

Definition of a contact

A contact is a person who has had exposure to a case during the period of communicability and is at risk of infection by the fecal-oral route by either person-to-person contact or the ingestion of contaminated food or water.

Contacts include:

- Household contacts (those living in the same residence)
- Close contacts including sexual contacts and persons that may have had hand-to-mouth contact with the case such as sharing meals the case has prepared.

Exclusion of contacts

Exclude contacts in the risk groups below:

Risk Group	Criteria for Exclusion
Contacts who are employed in: <ul style="list-style-type: none">• food handling,• child care*• health care and/or other staff who have contact with susceptible persons * Inclusive of those attending child care.	<p><i>Symptomatic:</i> Until 2 negative stool samples have been obtained at least 24 hours apart AND at least 48 hours after discontinuance of antibiotics.</p> <p><i>Asymptomatic:</i> Collect one screening stool sample. Exclusion not necessary while awaiting culture results.</p> <p>Note: If any of the culture specimens are positive for verotoxin-producing <i>E. coli</i> then treat as a case.</p>

Note: Ensure that all samples submitted to the laboratory for testing are labelled "Public Health management requirement to inform exclusion".

Education of contacts

If Public Health is notifying contacts, inform the contacts of the following:

- Their potential exposure
- An explanation of the illness (description of the disease, symptoms, etc.)
- The range of clinical presentation
- Incubation period
- Requirement for testing for symptomatic and asymptomatic contacts identified as belonging to any of the Risk Groups in the [Exclusion of contacts](#) section
- Report to Public Health if they become symptomatic

See the [General Information Sheet](#) for further information on preventing the transmission of *E. coli*.

Outbreak

Consult the [Public Health Outbreak Response Plan](#) for further guidance if an outbreak is suspected.

For outbreaks in child care settings also refer to the [Guidelines for Communicable Disease Prevention and Control for Child Care Settings](#).

For Outbreaks in Long-Term Care Facilities also refer to Infection Prevention and Control Nova Scotia's (IPCNS) - [Infection Prevention and Control: Guidelines for Long-Term Care Facilities](#).

Surveillance forms

novascotia.ca/dhw/populationhealth/surveillanceguidelines/NS_Notifiable_Disease_Surveillance_Case_Report_Form.docx

novascotia.ca/dhw/populationhealth/surveillanceguidelines/Enteric_Case_Report_Form.pdf

novascotia.ca/dhw/populationhealth/surveillanceguidelines/Verotoxigenic_E_Coli_Case_Report_Form.pdf

General Information Sheet

References

E. coli. cdc.gov/ecoli/

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