

# Verotoxin-producing *E. Coli* infection indicator conditions, including Hemolytic Uremic Syndrome (HUS)

## Reporting Obligations

VTEC and HUS is designated as a disease of public health significance and is reportable under the *Ontario Health Protection and Promotion Act*. Report all suspect and confirmed cases within **one business day** to the health unit.

### REPORTING FORM

## Epidemiology

### Aetiologic Agent:

Verotoxin-producing *Escherichia coli* (VTEC), also known as Shiga toxin-producing *E. coli* (STEC), is a highly pathogenic subtype of *E. coli*. VTEC are distinguished from other *E. coli* by the ability to produce Shiga toxins (also referred to as verotoxins), or by the presence of genes encoding those toxins.

*E. coli* O157:H7 is most commonly associated with infection in humans. However, the clinical relevance of non-O157 subtypes of VTEC have been increasingly recognized.

### Clinical Presentation:

Self-limiting enteric disease in infants and adults; characterized by bloody or non-bloody diarrhea, abdominal cramping, vomiting, acidosis, prostration, malaise and dehydration; fever is not present in most cases and symptoms usually lasts fewer than 5 days. Mild and asymptomatic infections may also occur.

Most individuals recover without residual sequelae, however, complications such as hemorrhagic colitis and Hemolytic Uremic Syndrome (HUS) can occur. HUS occurs in about 8% of infected children as well as in a small number of adults, particularly the elderly.

### Modes of transmission:

Transmitted by the fecal-oral route mainly by ingestion of contaminated food. Ground beef is a common source of infection, but other known sources include fermented meats, fresh produce such as lettuce, spinach, coleslaw, sprouts and melons and unpasteurized milk and beverages such as apple cider and orange juice.

Waterborne transmission can occur through the ingestion of contaminated drinking water or recreational water.

Animal to person transmission can occur at farms and petting zoos.

Person-to-person transmission most frequently occurs in settings (e.g., day nurseries) where personal hygiene practices are inadequate.

### Incubation Period:

2 – 10 days with a median of 3 – 4 days. HUS typically develops 7 days (up to 3 weeks) after onset of diarrhea.

### Period of Communicability:

Variable, as long as organisms are excreted; the duration of excretion of the pathogen is typically 1 week or less in adults but can be 3 weeks in one third of children. Prolonged carriage is uncommon.

## Risk Factors/Susceptibility

The infectious dose is very low. Little is known about differences in susceptibility and immunity, but infections occur in persons of all ages. Children under five years are most frequently diagnosed with infection and are at greatest risk of developing HUS. The elderly also appear to be at increased risk of complications.

- Close contact with case
- Animal contact
- Poor hand hygiene practices
- Consumption of raw/undercooked meat/poultry
- Consumption of unpasteurized milk/milk products
- Consumption of contaminated water
- Travel outside province/country within last 10 days

## Diagnosis & Laboratory Testing

Routine screening for non-O157 VTEC is not routinely performed in most laboratories. This testing can be performed at the Public Health Ontario Laboratories if specifically requested.

### TESTING INFORMATION & REQUISITION

## Treatment & Case Management

Use of antibiotics is not recommended. Treatment of VTEC is largely supportive and may require hospital admission.

Provide information to patients on personal prevention measures (careful hand hygiene after defecation, sexual contact and before preparing or eating food). Household members should be assessed for symptoms. Instruct patients to keep samples of implicated foods for testing by public health.

Exclude symptomatic food handlers, healthcare providers, and day care staff and attendees until the provision of 2 consecutive negative stool specimens or rectal swabs taken at least 24 hours apart and at least 48 hours after the completion of antibiotic and/or anti-diarrheal therapy medications if these medications have been used. Public Health will investigate cases to determine the source of infection.

## Patient Information

### PATIENT FACT SHEET

## References

1. Heymann, D.L. Control of Communicable Disease Manual (21st Ed.). Washington, American Public Health Association, 2022.
2. [Ontario. Ministry of Health. Infectious Diseases Protocol, Appendix 1: Verotoxin-producing \*E. coli\* infection indicator conditions, including Hemolytic Uremic Syndrome \(HUS\).](#) Toronto: Queen's Printer for Ontario; 2022 [cited 2024 Mar 12].

## Additional Resources

1. [Public Health Agency of Canada. \*E. coli\*: 2021-10-21.](#)
2. [Simcoe Muskoka HealthSTATS: VTEC.](#)
3. [PHO. Verotoxin-producing \*Escherichia coli\* \(VTEC\). Toronto: PHO; 2023 Dec 15. \[cited 2024 Mar 12\].](#)