

***E. coli* (Shiga Toxin-Producing *Escherichia coli*)**

Shiga toxin-producing *E. coli* (STEC, including *E. coli* O157:H7) are strains of the bacteria *Escherichia coli* (*E. coli*). Although most *E. coli* strains are harmless and live in the intestines of healthy humans and animals, these strains produce a potent toxin and can cause a severe illness called Hemolytic uremic syndrome (HUS). HUS is a serious complication of STEC infection which can result in kidney failure and death.

Transmission

People of all ages are at risk. Young children and the elderly are at greatest risk for developing HUS after they are infected with STEC. STEC is shed in animal and human feces. People can become ill with STEC by ingesting food or water contaminated with STEC (i.e., leafy greens). In general, infection happens in the following ways:

- **Animal to Person.** Direct contact with cattle or other animals.
- **Person to Person.** Direct contact with the feces of an infected person.
- **Contaminated food or water source** including:
 - Consumption of raw or undercooked meat.
 - Ingestion of food prepared by someone who did not wash their hands after using the toilet.
 - Consumption of unpasteurized products including
 - Unpasteurized (raw) milk
 - Unpasteurized apple cider
 - Soft cheeses made from raw milk
- **Environment to Person.** Touching the environment where animals are present.

Past infection does not make a person immune to STEC.

Symptoms

Symptoms usually appear three to four days after exposure but can appear in as soon as one day or as long as 10 days. Symptoms usually last about five to seven days. **Symptoms often begin with mild abdominal pain and non-bloody diarrhea and may include:**

- **Sever stomach cramps**
- **Diarrhea that becomes bloody**
- **Vomiting**
- **Fever (generally less than 101°F)**

Mild infections are common, but more **severe or even life-threatening symptoms may develop**, especially in **very young children and the elderly**:

- Roughly **five to 10%** of those diagnosed with STEC can develop **HUS**. Signs to look for include:
 - **Decreased frequency of urination**
 - **Fatigue**
 - **Pale complexion**
 - People with **HUS need to be hospitalized** because they can develop serious complications
 - **Most recover** within a few weeks, but some will have permanent damage or die.

Diagnosis

STEC is diagnosed by laboratory test of a stool sample (feces) taken from an infected individual.

Prevention

- **Wash hands** thoroughly with soap and water after
 - Using the bathroom
 - Changing diapers
 - Before preparing food
 - Contact with animals and their environments (farms, petting zoos, fairs, and your backyard)
- **Cook meats thoroughly**, especially beef and meat that has been tenderized, such as hamburger
 - Cook to internal temperature of at least 160°F
 - Color is not a reliable indicator of the meat being done

Treatment

- **No specific treatment**
- **Supportive care**, such as hydration
- **Antibiotics should not be used** as there is no evidence to support doing so and **can increase the risk of HUS**
 - Antidiarrheal agents may also increase this risk

For more information about the treatment of STEC contact your health care provider or visit [STEC | CDC](#).

Exclusion Guidance

- **Exclude children from child care until** diarrhea ceases and two consecutive negative stool sample are obtained 24 hours apart (48 hours after completion of antibiotics).
- **Exclusion from schools** should be handled on a case-by-case basis.
- **Health care workers and people who provide child care** should be excluded from caring for patients or children until diarrhea ceases and two consecutive negative stool samples are obtained.
- **Food handlers must be excluded from handling food until** diarrhea ceases and two consecutive negative stool samples are obtained at least 24 hours apart and at least 48 hours after finishing antibiotics, or until they have been asymptomatic for at least seven days. If a food handler was diagnosed with a STEC infection but had no symptoms, he/she cannot return to work until seven days have passed since the diagnosis. Approval from the food establishment's regulatory authority is required before a food handler can return to work.
- [General exclusions still apply](#) for other workers and those in schools.

For additional information about STEC, etc., contact the North Dakota Department of Health and Human Services', Division of Public Health, at 800.472.2286.

This disease is a reportable condition. As mandated by North Dakota law, any incidence of this disease shall be reported to the North Dakota Department of Health and Human Services.

Resources:

1. Kimberlin, D. W., Barnett, E. D., Lynfield, R., Sawyer, M. H. (2021) Red Book: 2021- Report of the Committee on Infectious Diseases. 31st ed. American Academy of Pediatrics. [Management and Prevention of Infectious Diseases] [322-328].
2. Centers for Disease Control and Prevention. (2014, December 1). *CDC – E. coli (Escherichia coli)*. Centers for Disease Control and Prevention. Retrieved May 24, 2023, from <https://www.cdc.gov/ecoli/general/index.html>

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