



Shiga Toxin-Producing *Escherichia coli*

(Shiga Toxin-Producing *E.coli*, STEC)

What is Shiga Toxin-Producing *Escherichia coli* disease?

Shiga toxin-producing Escherichia coli (STEC) cause a diarrheal illness. *E.coli* O157:H7 is the most common strain of STEC infections. Although most strains of *E. coli* are harmless and live in the intestines of healthy humans and animals, shiga toxin-producing strains produce a toxin and can cause severe illness and are known to cause outbreaks in certain settings. A serious complication of STEC infection is hemolytic uremic syndrome (HUS), in which the red blood cells are destroyed and the kidneys may fail.

Who is at risk for STEC?

People of all ages are at risk. Children younger than 5 and the elderly are at greatest risk for developing HUS.

What are the symptoms of STEC?

STEC infection often causes severe bloody diarrhea and abdominal cramps; sometimes the infection causes non-bloody diarrhea or no symptoms at all. Usually little or no fever is present, and people recover in five to 10 days.

About 2 percent to 7 percent of infections lead to HUS complication. In the United States, HUS is the principal cause of acute kidney failure in children, and most cases of HUS are caused by *E. coli* O157:H7.

How soon do symptoms appear?

Symptoms usually appear within 3 to 4 days from the time of infection.

How is STEC spread?

The organism can live in the intestines of healthy cattle. Meat can become contaminated during slaughter, and organisms can be thoroughly mixed into beef when it is ground. Bacteria present on the cow's udders or on equipment may get into raw milk.

Eating meat, especially ground beef, that has not been cooked sufficiently to kill STEC can cause infection. Contaminated meat looks and smells normal. Although the number of organisms required to cause disease is not known, it is suspected to be very small.

Drinking unpasteurized milk and swimming in or drinking sewage-contaminated water also can cause infection.

Bacteria in diarrhea stools of infected people can be passed from one person to another if hygiene or hand-washing habits are inadequate. This is particularly likely among infants and toddlers who are not toilet trained. Family members and playmates of these children are at high risk of becoming infected.

When and for how long is a person able to spread the disease?

An infected person is able to spread the disease as long as the bacteria remain in their diarrhea stools. Young children typically shed the organism in their stools for a week or two after their illness resolves. Older children rarely carry the organism without symptoms.

How is a person diagnosed?

Infection with STEC is diagnosed by detecting the bacterium in the stool. All people who suddenly have diarrhea with blood should get their stool tested for STEC.

What is the treatment?

Most people recover without antibiotics or other specific treatment in five to 10 days. There is no evidence that antibiotics improve the course of disease, and it is thought that treatment with some antibiotics may cause kidney complications. Antidiarrheal agents, such as loperamide (Imodium), also should be avoided.

HUS is a life-threatening condition usually treated in an intensive care unit. Blood transfusions and kidney dialysis often are required. With intensive care, the death rate for HUS is 3 percent to 5 percent.

Does past infection make a person immune?

No. The illness may recur if the person is infected again.

Should children or others be excluded from day care, school, work or other activities if they have STEC?

Yes. All children should be excluded until diarrhea ceases and two successive negative stool cultures are obtained (collected 24 hours apart and not sooner than 48 hours after the last dose of antibiotics).

All food handlers and health-care workers should be excluded from handling food or caring for patients until diarrhea ceases and two successive negative stool cultures are obtained.

What can be done to prevent the spread of STEC disease?

- Cook all ground beef or hamburger thoroughly. Make sure that the cooked meat is gray or brown throughout (not pink), any juices run clear and the inside is hot (165°F).
- If you are served an undercooked hamburger in a restaurant, send it back for further cooking.
- Consume only pasteurized milk and milk products. Avoid raw milk.
- Make sure that infected people, especially children, wash their hands carefully and frequently with soap to reduce the risk of spreading the infection.
- Drink municipal water that has been treated with adequate levels of chlorine or other effective disinfectants.

Additional Information:

For additional information, call the North Dakota Department of Health at 800.472.2180.

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.

Resources: American Academy of Pediatrics. [Children In Out-of-Home Child Care]. In: Pickering LK, ed. Red Book: 2009 Report of the Committee on Infectious Diseases. 28th ed. Elk Grove Village, IL: American Academy of Pediatrics; 2009:[124-140].

Control of Communicable Disease Manual, 19th Edition-2008, Heymann, David, MD ed.

