



What is *E. coli*?

Escherichia coli (*E. coli*) are bacteria commonly found in the digestive tracts of humans and animals, where they make up part of the normal bacteria of the intestine. Though most of these bacteria are harmless, others can cause serious illness. Some kinds of *E. coli* cause illness by making a toxin called Shiga toxin. These bacteria are called Shiga toxin-producing *E. coli* or STEC for short. One common type of STEC is *E. coli* O157:H7, but there are other Non-O157:H7 strains such as O111, O26, and others.

What are the symptoms of infection with STEC?

Mild to severe diarrhea is the primary symptom of STEC; stools may be watery and frequent. In more severe cases, the diarrhea may contain blood. Stomach cramps and vomiting may occur, but fever is usually absent. Between 5-10% of people that are diagnosed with STEC disease develop a life-threatening condition called hemolytic uremic syndrome (HUS), a condition in which red blood cells are destroyed and the kidneys fail. Clues that a person is developing HUS include decreased frequency of urination, feeling very tired, and losing pink color in their cheeks and inside the lower eyelids. Persons with HUS are usually hospitalized because their kidneys may stop working and they may develop other serious problems. Most persons with HUS recover within a few weeks, but some suffer long term damage or loss of life. People of all ages can experience illness due to STEC; however, children under 5 years of age and the elderly are more likely to experience severe illness due to STEC as well as HUS.

How is STEC spread?

E. coli O157:H7, and other strains of STEC, live in the guts of ruminant animals such as cattle, goats, sheep, and deer. Cattle are the main source for STEC, with up to 50-80% of cattle herds carrying the bacteria. STEC that cause human illness usually do not make animals sick; therefore, a healthy animal may be shedding STEC in the feces. Direct or indirect contact with the feces of these animals can result in infection. Infection may also occur after eating undercooked ground beef, drinking contaminated raw milk, swimming in, or drinking contaminated water, or by consuming foods or mouthing objects that have been contaminated with feces of an infected animal. Infection can also occur during hand-to-mouth activities (ex: eating, drinking, biting finger nails) while in petting zoos and other animal exhibits such as livestock barns and arenas. Person-to-person transmission can occur if people with STEC disease do not wash their hands after using the toilet or if people do not wash their hands after changing diapers of a child with STEC.

How soon after infection do symptoms occur?

The time between ingesting STEC bacteria and beginning symptoms can be anywhere from 2 to 10 days, but symptoms usually occur within 3 to 4 days.

How long can an infected person spread the bacteria?

STEC is spread in the feces of sick adults for about one week, but can be passed in the feces of sick children for up to three weeks.

Should people sick with STEC stay home from work, school, or day care?

People who have had diarrhea due to an STEC infection may safely return to work when they have normal stools for at least 24 hours. Persons working in food services, in a child care centers, or in direct patient care must not work while they have diarrhea. Children should not attend a child care center with diarrhea. Those in food service, child care centers or health care settings who have been diagnosed with an STEC infection will be excluded from those settings until diarrhea has ceased AND two stool cultures submitted at least 24 hours apart have tested negative for STEC. A public health nurse from the local county health department will coordinate the stool specimen collection and testing.

What is the treatment for STEC infection?

Non-specific supportive therapy, including hydration, is important. Most persons recover without specific treatment in 5-10 days. Antibiotics are not recommended as there is no evidence that antibiotics improve the course of disease, and there is some evidence that treatment with antibiotics may increase the risk of HUS. Antidiarrheal agents should also be avoided, as they may also increase the risk of HUS. Individuals who experience symptoms of illness similar to STEC should contact their health care provider.

What can be done to prevent an STEC infection?

Actions to prevent STEC fall into three categories:

Hygiene:

1. Always wash your hands with soap and water after changing diapers or using the toilet and before preparing or eating food.
2. Avoid preparing food for other people while you are ill with diarrhea.
3. Always wash hands carefully before, and after, preparing any raw meat to prevent cross-contamination.
4. Make sure that children wash their hands carefully, especially after using the bathroom, petting livestock, or being in a livestock area.

Precautions for settings associated with STEC:

1. People who work with livestock, especially cattle, sheep, and goats, should practice good personal hygiene and hand washing, with soap and water, after contact with animals. They should also avoid eating food or drinking beverages while in animal environments.
2. People visiting petting zoos or livestock settings such as pens & barns should practice good personal hygiene and hand washing, with soap and water, after contact with animals and upon leaving these areas. Avoid taking baby bottles, pacifiers, food, and beverages into the area of animal contact.
3. Shoes and clothing soiled with animal manure should not be worn in the house.
4. Avoid swimming in farm ponds or lakes where animal waste could be draining into the swimming area.

Food Preparation and Recommendations:

1. Do not eat raw, or undercooked ground meats. Cook hamburger until it is well done and there is no pink inside. Use a meat thermometer to insure an internal temperature of 70°C (160°F).
2. Always refrigerate meat and meat products. NEVER leave meats at room temperature. Place meats in a plastic bag or container so they do not drip on other foods, especially ready-to-eat foods such as fruit or vegetables.
3. Clean cutting boards and utensils used to prepare raw meat with soap and warm water after each use to prevent cross-contamination.
4. Avoid drinking unpasteurized milk or juices, such as unpasteurized apple cider.
5. Fruits and vegetables, including juice, can also become contaminated with STEC bacteria during growing and post-harvest processing; however, cooking these items will destroy STEC bacteria. All raw fruits and vegetables, and unpasteurized juices, should be considered potentially contaminated with bacteria and should be washed before eating.
6. Rinse raw fruits and vegetables in cool tap water immediately before eating. Do not use soap or detergents. Scrub firm produce, such as melons and cucumbers, with a clean produce brush.
7. Sprouts, such as alfalfa sprouts and bean sprouts, may contain STEC and other bacteria inside them, which cannot be removed by washing. For this reason, it is advisable that children, the elderly, and those with weakened immune systems (such as those receiving cancer treatment, taking immunosuppressive drugs or infected with HIV) only eat cooked sprouts.