

E.coli Enterohemorrhagic (EHEC) Shiga Toxin Producing E.coli (STEC) E.coli O157 H7

What are E.coli?

Escherichia coli (abbreviated as *E. coli*) are bacteria found in the environment, foods, and intestines of people and animals. *E. coli* are a large and diverse group of bacteria. Although most strains of *E. coli* are harmless, others can make you sick. Some kinds of *E. coli* can cause diarrhea, while others cause urinary tract infections, respiratory illness and pneumonia, and other illnesses.

What are Shiga Toxin Producing E.coli or STEC?

Some kinds of *E. coli* cause disease by making a toxin called Shiga toxin. The bacteria that make these toxins are called "Shiga toxin-producing" *E. coli*, or STEC for short. You might hear these bacteria called enterohemorrhagic *E. coli* (EHEC); these all refer generally to the same group of bacteria.

The most common STEC in North America is *E. coli* O157:H7 (often shortened to *E. coli* O157 or even just "O157"). When you hear news reports about outbreaks of "*E. coli*" infections, they are usually talking about *E. coli* O157.

In addition to *E. coli* O157, there are many other kinds (called serogroups) of STEC cause disease. Other *E. coli* serogroups in the STEC group, including *E. coli* O145, are sometimes called "non-O157 STECs."

What are the symptoms of illness caused by STEC or EHEC?

Plain *E. coli* is a normal inhabitant of the intestines and does not cause any illness, but the STEC strains can be harmful.

Some types of STEC frequently cause severe disease, including bloody diarrhea and hemolytic uremic syndrome (HUS), which is a type of kidney failure.

The symptoms of STEC infections vary for each person but often include severe stomach cramps, diarrhea (often bloody), and vomiting. If there is fever, it usually is not very high (less than 101 °F/less than 38.5 °C). Most people get better within 5 to 7 days. Some infections are very mild, but others are severe or even life-threatening.

How serious is STEC?

Around 5% to 10% of those who are diagnosed with STEC infection develop a potentially life-threatening complication known as hemolytic uremic syndrome (HUS). Clues that a person is developing HUS include decreased frequency of urination, feeling very tired, and losing pink color in cheeks and inside the lower eyelids. Persons with HUS should be 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 permanent damage or die.

How soon do STEC infection symptoms occur?

The time between ingesting the STEC bacteria and feeling sick is called the "incubation period." The incubation period is usually 3 to 4 days after the exposure, but may be as short as 1 day or as long as 10 days. The symptoms often begin slowly with mild belly pain or non-bloody diarrhea that worsens over several days. HUS, if it occurs, develops an average 7 days after the first symptoms, when the diarrhea is improving.

How are STEC diagnosed? When to seek medical care?

STEC infections are usually diagnosed through laboratory testing of stool specimens (feces). Many labs can determine if STEC are present, and most can identify *E. coli* O157.

Contact your healthcare provider if you have diarrhea that lasts for more than 3 days, or is accompanied by high fever, blood in the stool, or so much vomiting that you cannot keep liquids down and you pass very little urine.

What is the best treatment for STEC?

Supportive therapy, including hydration, is important. Antibiotics should not be used to treat this infection because antibiotics are not effective against a toxin. There is no evidence that treatment with antibiotics is helpful, and taking antibiotics may increase the risk of HUS. Antidiarrheal agents like Imodium® may also increase that risk.

Where do STEC come from?

STEC live in the guts of ruminant animals, including cattle, goats, sheep, deer, and elk. The major source for human illnesses is cattle. STEC that cause human illness generally do not make animals sick. Other kinds of animals, including pigs and birds, sometimes pick up STEC from the environment and may spread it.

How are infections spread?

Infections start when you swallow STEC - in other words, when you get tiny (usually invisible) amounts of human or animal feces in your mouth. Unfortunately, this happens more often than we would like to think about.

Exposures that result in illness include

- consumption of contaminated food,
- consumption of unpasteurized (raw) milk,
- consumption of water that has not been disinfected,
- contact with cattle, or
- contact with the feces of infected people.

Some foods are considered to carry such a high risk of infection with *E. coli* O157 or another germ that health officials recommend that people avoid them completely. These foods include unpasteurized (raw) milk, unpasteurized apple cider, and soft cheeses made from raw milk.

Sometimes the contact is pretty obvious (working with cows

at a dairy or changing diapers, for example), but sometimes it is not (like eating an undercooked hamburger or a contaminated piece of lettuce). People have gotten infected by swallowing lake water while swimming, touching the environment in petting zoos and other animal exhibits, and by eating food prepared by people who did not wash their hands well after using the toilet.

Where does my infection come from?

Because there are so many possible sources, for most people we can only guess.

How common are STEC infections?

We think that about 3,500 STEC infections occur each year in Louisiana. STEC O157 causes about one third of these infections, and non-O157 STEC cause the rest.

We use estimates rather than actual numbers of infections because not all STEC infections are diagnosed, for several reasons. Many infected people do not seek medical care; many of those who do seek care do not provide a stool specimen for testing, and many labs do not test for non-O157 STEC. But in these days labs have begun using newer, simpler tests that can help detect STEC so we see more STEC being diagnosed.

How long are people contagious?

STEC typically disappear from the feces by the time the illness is resolved, but may be shed for several weeks, even after symptoms go away. Young children tend to carry STEC longer than adults. A few people keep shedding these bacteria for several months. Good hand-washing is always a smart idea to protect yourself, your family, and other persons.

Who gets STEC infection?

People of any age can become infected. Very young children and the elderly are more likely to develop severe illness and hemolytic uremic syndrome (HUS) than others, but even healthy older children and young adults can become seriously ill.

What is treatment for STEC infection?

BY DRINKING FLUIDS, such as juice or water, people can reduce their chance of becoming dehydrated. Sports drinks do not replace the nutrients and minerals lost during this illness.

Do infected people need to be excluded from school, work or daycare?

School and work exclusion policies differ by local jurisdiction. In Louisiana we recommend that people infected with STEC be excluded for as long as they have diarrhea.

In any case, good hand-washing after changing diapers, after using the toilet, and before preparing food is essential to prevent the spread of these and many other infections.

Can STEC infections be prevented?

You can lower your chances of getting a STEC infection:

- WASH HANDS often, particularly after using the bathroom since that is where a lot of the surfaces are contaminated: toilet area, sink area, faucets, light switch, faucet, door handle. Wash with warm water and soap
- WASH YOUR HANDS thoroughly after using the bathroom or changing diapers and before preparing or eating food.
- WASH YOUR HANDS after contact with animals or their environments (at farms, petting zoos, fairs, even your own backyard).
- Hand sanitizers (with alcohol) do work well and can replace hand washing if there is no convenient way to wash hands. Make sure to use enough hand sanitizer and rub all parts of your hand.
- Disinfect contaminated surfaces with household CHLORINE (bleach-based cleaners). To work well, make sure you give chlorine enough time on the surface.
- Washing soiled clothing and linens. Be careful when loading the soiled linens not to spread the bacteria throughout the laundry. Ideally you want to pick up clothes soiled by feces or vomitus in a garbage bag, bring it to the laundry, dump the clothes in the washing machine and discard the bag. Once washed, there is no risk.

FOOD & WATER:

- Avoid food or water from sources that may be contaminated
- COOK meats thoroughly. Ground beef and meat that has been needle-tenderized should be cooked to a temperature of at least 160°F/70°C. It's best to use a thermometer.
- AVOID raw milk, unpasteurized dairy products, and unpasteurized juices (like fresh apple cider).
- AVOID swallowing water when swimming or playing in lakes, ponds, streams, swimming pools, and backyard "kiddie" pools.
- PREVENT cross contamination in food preparation areas by thoroughly washing hands, counters, cutting boards, and utensils after they touch raw meat.

Environmental Disinfection

Think of items that are touched regularly and make sure that they are cleaned frequently. The recommended disinfectant is freshly made bleach solution (e.g. one cup bleach to nine cups of water).