CONDITION

E. coli infection

E. coli infection is an intestinal illness caused by harmful strains of bacteria, often spread through contaminated food or water.

WHAT IT IS
Intestinal illness caused by harmful E. coli bacteria

BODY SYSTEM
Digestive system

MAIN SYMPTOMS
Diarrhea, stomach cramps, nausea, vomiting

WHAT CAUSES IT
Infection with harmful E. coli strains

HOW IT IS DIAGNOSED
Stool PCR, Shiga toxin testing, and culture

MAIN TREATMENT
Fluids and supportive care; selective antibiotic treatment

CAN IT BE CURED?
Yes - most clear with supportive care

IS IT AN EMERGENCY?
Sometimes - severe dehydration or HUS signs

LONG-TERM OUTLOOK
Most recover fully; HUS can cause lasting kidney problems

Overview

Escherichia coli, usually shortened to _E. coli_, is a large group of bacteria. Many types live normally in the intestines and do not cause illness. Some harmful strains can cause diarrhea, stomach cramps, and other digestive symptoms.

One important group is Shiga toxin-producing _E. coli_, or STEC. These bacteria make a toxin that can damage the bowel. STEC is also sometimes called verotoxin-producing _E. coli_, or VTEC. _E. coli_ O157:H7 is a well-known strain, but other strains can cause similar illness.

Most intestinal _E. coli_ infections improve with fluids, rest, and time. However, STEC can occasionally cause hemolytic uremic syndrome, known as HUS. This complication damages red blood cells and can affect the kidneys.

E. coli can also cause urinary tract infections, bloodstream infections, and other illnesses. This article focuses on intestinal infection that causes diarrhea.

Symptoms

Symptoms often begin within several days of exposure, although the timing differs by strain. Illness can be mild or severe.

Possible symptoms include:

STEC often causes intense cramps and diarrhea that may become bloody. Blood in the stool does not prove that you have STEC, because several infections and bowel conditions can cause it. It does mean that you should seek prompt medical advice.

Vomiting and frequent diarrhea can cause dehydration. Signs include a dry mouth, strong thirst, dark urine, urinating less often, dizziness, and unusual sleepiness. Babies, young children, and older adults may become dehydrated more quickly.

Some people carry harmful _E. coli_ without noticeable symptoms. They may still pass the bacteria in their stool.

- Watery or bloody diarrhea
- Strong stomach cramps
- Nausea or vomiting
- Reduced appetite
- Tiredness
- A mild fever, although some people have no fever

Causes and risk factors

Intestinal infection happens when harmful _E. coli_ enters your mouth. A very small amount of some STEC strains may be enough to cause illness.

Possible sources include:

The bacteria can spread between foods on hands, knives, chopping boards, and kitchen surfaces. A food can look and smell normal while still carrying harmful bacteria.

Anyone can become infected. Young children and older adults have a greater risk of developing HUS from STEC. People with weakened immune systems may also be more likely to have severe or prolonged illness.

Travel can increase exposure to contaminated food or water. Some _E. coli_ strains are a common cause of travelers' diarrhea and do not carry the same HUS risk as STEC.

- Undercooked ground beef or other contaminated food
- Raw produce contaminated during growing, processing, or preparation
- Unpasteurized milk, juice, or dairy products
- Water that has not been safely treated
- Contact with farm animals, petting zoos, or animal waste
- Swallowing contaminated water while swimming
- Contact with an infected person's stool, often through unwashed hands

Diagnosis

A healthcare professional may suspect an intestinal infection from your symptoms, recent meals, travel, animal contact, or contact with someone who has diarrhea. Symptoms alone cannot identify the exact germ.

A stool sample can confirm _E. coli_ infection. Laboratories may use:

Testing for Shiga toxin is important when STEC is possible because it can affect treatment decisions. Culture may also help public health teams find links between cases during an outbreak.

Not everyone with short-lived diarrhea needs testing. Testing is more likely when diarrhea is bloody, symptoms are severe or persistent, several people may be affected, or there is concern about an outbreak.

If HUS is suspected, blood and urine tests can check red blood cells, platelets, and kidney function. Platelets are blood cells that help stop bleeding.

- A PCR test, which looks for genetic material from harmful bacteria
- A test for Shiga toxin or the genes that make it
- A stool culture, which grows bacteria for identification

Treatment and management

Replacing lost fluid is the main treatment for most intestinal _E. coli_ infections. Small, frequent sips may be easier if you feel sick. An oral rehydration solution contains water, salts,

and sugar in proportions designed to replace losses from diarrhea.

You can eat as you feel able. Simple foods may be more comfortable at first, but a highly restricted diet is not usually necessary. Babies should generally continue breast milk or their usual feeds unless a healthcare professional advises otherwise.

Severe dehydration may require intravenous fluids, which are given into a vein. Early fluid treatment is especially important for children with suspected STEC.

Antibiotics like amoxicillin or doxycycline are not routinely used for every _E. coli_ infection. They may help with some non-STEC strains, depending on the illness, test results, and personal risk factors. In suspected or confirmed STEC, antibiotics are generally avoided because some may increase the risk of HUS.

Do not use anti-diarrheal medicines such as loperamide for bloody diarrhea, high fever, or suspected STEC unless a healthcare professional specifically advises it. Slowing the bowel may make some infections more serious.

HUS requires hospital care. Treatment may include careful fluid management, blood transfusions, and temporary dialysis. Dialysis uses a machine or special fluid to perform some of the kidneys' work while they recover.

Complications

Dehydration is the most common complication. It can disturb the body's balance of water and salts and may require treatment in hospital.

The main serious complication of STEC is HUS. The toxin damages small blood vessels, leading to:

HUS may begin as diarrhea appears to improve. Warning signs include much less urine, blood in the urine, marked tiredness, pale skin, unexplained bruising, reduced alertness, or swelling.

Most people treated for HUS recover, but recovery can take time. Some develop lasting kidney damage, high blood pressure, or other health problems that need follow-up. Severe neurological problems, such as seizures or confusion, can occur but are less common.

Rarely, severe intestinal infection can cause major bleeding, bowel damage, or a bloodstream infection.

- Destruction of red blood cells
- A low platelet count
- Sudden kidney injury

Prevention

Not every _E. coli_ infection can be prevented, but careful food, water, and hand hygiene reduces the risk.

Wash your hands with soap and running water after using the toilet or changing a diaper, before preparing or eating food, and after touching animals or their surroundings. Soap and water are particularly important when diarrhea is present.

To reduce food-related exposure:

Avoid swallowing water in pools, lakes, or other recreational water. Do not swim while you have diarrhea.

If you are ill, avoid preparing food for other people. Clean toilets, taps, flush handles, and other frequently touched bathroom surfaces. Local rules may require food handlers, healthcare workers, childcare workers, or young children in daycare to have negative stool tests before returning.

- Cook ground meat thoroughly and check it with a food thermometer
- Keep raw meat separate from cooked and ready-to-eat foods
- Wash hands, utensils, boards, and surfaces after handling raw meat
- Wash produce under running water
- Avoid unpasteurized milk, juice, and dairy products
- Use water known to be safe for drinking and food preparation

Living with it and what to expect

Most uncomplicated intestinal _E. coli_ infections settle over several days to about a week. Diarrhea and cramps usually improve first. Appetite, energy, and usual bowel habits may take longer to return.

Continue drinking regularly while recovering. If your urine becomes darker or less frequent, you may not be replacing enough fluid. Some people temporarily find fatty foods, alcohol, caffeine, or large meals harder to tolerate.

An uncomplicated infection does not usually become a long-term condition. However, infection with one strain may not protect you from other strains, so another infection is possible.

Recovery after HUS is less predictable. Kidney function may return fully, improve gradually, or

remain reduced. Follow-up may include blood pressure checks and blood or urine tests for months or longer. Some people need ongoing kidney care, while others return to their usual activities without lasting limitations.

When to get medical help

Contact a healthcare professional promptly if you have:

Seek advice earlier for a baby, young child, older adult, pregnant person, or someone with a weakened immune system or kidney condition.

Seek emergency care for signs of HUS or severe dehydration. These include barely passing urine, blood in the urine, unusual bruising, very pale skin, swelling, confusion, fainting, extreme drowsiness, or difficulty waking. A seizure or loss of consciousness also needs emergency help.

Routine follow-up may be needed after confirmed STEC, particularly if symptoms continue or testing showed changes in kidney function or blood counts.

- Bloody or black stool
- Severe or worsening stomach pain
- Frequent vomiting that prevents you from drinking
- Diarrhea that is not improving
- A high fever or significant weakness
- Signs of dehydration, such as little urine or persistent dizziness
- Symptoms after a known outbreak or confirmed exposure

Common questions

Is an E. coli infection contagious?

Yes. Intestinal _E. coli_ can pass from stool to another person's mouth through unwashed hands, contaminated surfaces, food, or water. Careful handwashing and bathroom cleaning help limit spread.

Is E. coli infection the same as food poisoning?

It can be. Harmful _E. coli_ is one cause of foodborne illness, but it can also spread through water, animals, swimming, or close contact with an infected person. Many other germs can cause similar food poisoning symptoms.

How long does E. coli infection last?

Many people improve within about a week, although symptoms can be shorter or longer. Tiredness and altered bowel habits may continue after the main infection. Persistent, worsening, or bloody diarrhea needs medical advice.

Do I need antibiotics for E. coli?

Not always. Most cases are managed with fluids and supportive care. Antibiotics may be considered for certain non-STEC infections, but they are generally avoided when STEC is suspected because of concern about HUS.

When can I return to work, school, or daycare?

Do not return while you still have diarrhea. Requirements differ by location and type of work. Food handlers, healthcare or childcare workers, and children in daycare may need public health clearance or stool testing before returning.

Is an intestinal E. coli infection the same as an E. coli UTI?

No. A urinary tract infection happens when _E. coli_ enters the urinary system and usually causes burning, urgency, or frequent urination. Intestinal infection affects the digestive system and mainly causes diarrhea and cramps.

Sources

- Centers for Disease Control and Prevention. About Escherichia coli Infection . E. coli Infection
- Centers for Disease Control and Prevention. Signs and Symptoms of E. coli Infection . E. coli Infection
- Centers for Disease Control and Prevention. Information for Clinicians . E. coli Infection
- World Health Organization. E. coli . Fact sheet, 7 February 2018
- Shane AL, Mody RK, Crump JA, et al. 2017 Infectious Diseases Society of America Clinical Practice Guidelines for the Diagnosis and Management of Infectious Diarrhea . Clinical Infectious Diseases . 2017;65(12):e45-e80
- National Institute of Diabetes and Digestive and Kidney Diseases. Foodborne Illnesses . Digestive Diseases Health Information