CONDITION

Leptospirosis

Leptospirosis is a bacterial infection caught through water or soil contaminated by infected animal urine.

WHAT IT IS
Bacterial infection spread through urine from infected animals

BODY SYSTEM
Whole body, especially kidneys, liver, lungs, and brain

MAIN SYMPTOMS
Fever, headache, muscle aches, red eyes

WHAT CAUSES IT
Infection with Leptospira bacteria

HOW IT IS DIAGNOSED
Blood or urine PCR and antibody testing

MAIN TREATMENT
Antibiotics and supportive hospital care when severe

CAN IT BE CURED?
Yes - antibiotics usually clear the infection

IS IT AN EMERGENCY?
Sometimes - breathing trouble, confusion, or very little urine

LONG-TERM OUTLOOK
Most recover; severe organ damage can be life-threatening

Overview

Leptospirosis is an infection caused by bacteria called Leptospira . The bacteria are carried by many wild and domestic animals, including rats, cattle, pigs, dogs, and some wildlife. Infected animals may release the bacteria in their urine.

People usually become infected when contaminated water or wet soil touches broken skin, the eyes, the mouth, or the nose. Infection may also follow direct contact with an infected animal's urine or body tissues. It does not usually spread from person to person.

Leptospirosis occurs worldwide. Risk is higher in warm, humid regions and after heavy rain or flooding. It can also be linked to farming, sewer work, animal care, freshwater sports, or travel.

Some infections cause no symptoms or only a mild flu-like illness. Others affect the kidneys,

liver, lungs, heart, or the lining around the brain. Early symptoms can resemble many other infections, so a history of possible exposure is important.

Symptoms

Symptoms usually begin several days to a few weeks after exposure. They may start suddenly.

Common symptoms include:

Symptoms may improve and then return. This two-stage pattern can occur when the immune response and organ inflammation continue after the first fever settles. Not everyone has this pattern.

Signs of a more serious infection can include yellow skin or eyes, known as jaundice; producing much less urine than usual; unusual bleeding; shortness of breath; coughing up blood; chest discomfort; confusion; or severe drowsiness.

A stiff neck, sensitivity to light, or a severe headache can occur if the tissues around the brain become inflamed. This is called meningitis.

Symptoms alone cannot confirm leptospirosis. Influenza, dengue, malaria, hepatitis, COVID-19, and several other infections can look similar.

- Fever or chills
- A strong headache
- Muscle aches, often in the calves or lower back
- Red eyes without much discharge
- Nausea, vomiting, diarrhoea, or stomach pain
- Marked tiredness
- A rash in some people

Causes and risk factors

Leptospirosis is caused by Leptospira bacteria. Animals can carry the bacteria in their kidneys and release them in urine without appearing ill. The bacteria may survive for weeks or months in fresh water or damp soil under suitable conditions.

The bacteria enter through cuts, grazes, softened or damaged skin, or the moist surfaces of the eyes, nose, and mouth. Swallowing contaminated water can also lead to infection. Salt water is not a usual source because the bacteria survive poorly in it.

Situations that can increase exposure include:

Having an open wound increases risk, but infection can also enter through the eyes, nose, or mouth. Casual contact with another person who has leptospirosis is not considered a common way to catch it.

- Wading or swimming in floodwater, rivers, lakes, or canals
- Working with livestock, rodents, animal urine, or animal tissues
- Sewer, drainage, waste, mining, or military work
- Kayaking, rafting, fishing, or other freshwater activities
- Living or working where rodent control and sanitation are limited
- Cleaning mud or buildings after floods
- Travelling in tropical areas, particularly during rainy seasons

Diagnosis

A healthcare professional will consider your symptoms, recent travel, work, animal contact, and exposure to freshwater, mud, or floodwater. Mentioning these exposures can help because early leptospirosis can look like many other conditions.

Blood tests may show signs of inflammation or problems involving the kidneys, liver, blood cells, or clotting. These findings can show how the infection is affecting the body, but they do not confirm the cause on their own.

Tests used to confirm leptospirosis include:

The best sample and test depend partly on how long you have been unwell. Treatment may begin before results return when symptoms and exposure make leptospirosis a strong possibility.

Tests may also be needed to check for other infections with similar symptoms.

- PCR testing: Detects genetic material from the bacteria. Blood is often more useful early in the illness, while urine may become useful later.
- Antibody testing: Looks for the immune system's response to the bacteria. An early test can be negative, so a second blood sample may be needed to show that antibody levels have risen.
- Microscopic agglutination testing: A specialised antibody test, often called MAT, which is usually performed by a reference laboratory.

Treatment and management

Leptospirosis is treated with antibiotics like amoxicillin or doxycycline . Treatment is generally started as early as possible when the condition is suspected rather than being delayed for laboratory confirmation.

People with a mild illness may be treated with an oral antibiotic. Examples used in clinical practice include doxycycline, amoxicillin, or azithromycin. The suitable option depends on factors such as age, pregnancy, allergies, other health conditions, and local guidance.

Severe infection usually requires hospital care and antibiotics given into a vein. Penicillin or ceftriaxone may be used. Hospital treatment can also support organs while the antibiotics clear the infection.

Supportive care may include:

Rest and enough fluids can support recovery from a mild illness, but vomiting, reduced urine, or worsening weakness may make home hydration unsafe or inadequate. Avoid taking extra pain medicines without checking whether they are suitable, especially if kidney or liver problems are suspected.

- Fluids and treatment for abnormal salt levels
- Oxygen or breathing support
- Dialysis if the kidneys cannot adequately filter the blood
- Treatment for bleeding or very low blood pressure
- Monitoring of the heart, liver, kidneys, and blood clotting

Complications

Most people recover, particularly when the infection is recognised and treated early. However, leptospirosis can sometimes cause widespread inflammation and organ damage.

A severe form involving jaundice, kidney injury, and bleeding is sometimes called Weil's syndrome. This is not a separate infection; it is a serious form of leptospirosis.

Other possible complications include:

Severe lung bleeding can develop rapidly and may occur with or without obvious jaundice. Kidney or liver test results can also worsen after the first symptoms appear, which is why follow-up testing may be needed.

- Acute kidney injury
- Liver inflammation and jaundice
- Bleeding into the lungs and severe breathing failure
- Meningitis or inflammation of the brain
- Inflammation of the heart muscle or an abnormal heart rhythm
- Shock caused by very low blood pressure
- Pregnancy complications, including pregnancy loss or premature birth

Prevention

There is no single measure that prevents every case. Human vaccines are available in only a small number of countries and may protect against only certain types of Leptospira . They are not part of routine vaccination in many places.

You can reduce exposure by:

If contact with floodwater cannot be avoided, try to cover broken skin and wear protective clothing. Shower and clean any wounds afterward.

Antibiotics are sometimes considered before or after a specific high-risk exposure, but they are not a substitute for protective measures and are not routinely needed after every freshwater contact. Public health or medical advice should guide their use.

- Avoiding swimming or wading in potentially contaminated floodwater
- Covering cuts and grazes with waterproof dressings
- Wearing waterproof boots and gloves when handling mud, sewage, or animals
- Washing exposed skin after contact with freshwater, mud, or animal urine
- Avoiding swallowing untreated water from lakes, rivers, or canals
- Using safe drinking water when travelling
- Controlling rodents and keeping food and rubbish in secure containers
- Following workplace protective measures when exposure is part of your job

Living with it and what to expect

A mild infection may improve over days to a few weeks. Fever and severe aches often settle

first, while tiredness, headaches, or reduced stamina can last longer. Recovery is not always steady, and activity may need to increase gradually.

After a more severe infection, follow-up may include blood or urine tests to check kidney and liver recovery. People who needed intensive care, dialysis, or breathing support may require longer rehabilitation.

Kidney and liver function often improve, but lasting organ problems are possible after severe injury. Some people report fatigue, muscle pain, headaches, or mood and concentration difficulties for weeks or months. Persistent symptoms need review because they may have more than one cause.

Having leptospirosis does not guarantee lasting protection. There are many types of Leptospira , and immunity to one type may not protect against another. Reinfection is therefore possible.

Return to work, exercise, or freshwater activities is guided by how well you have recovered and whether organ tests have returned toward normal. Someone recovering from serious kidney, liver, lung, or heart involvement may need a slower return.

When to get medical help

Seek prompt medical advice if you develop fever, headache, strong muscle pain, red eyes, vomiting, or marked tiredness after recent contact with floodwater, freshwater, sewage, rodents, livestock, or animal urine. Mention the exposure, where it happened, and when it occurred.

If you have already been assessed, arrange routine follow-up as advised. Contact your healthcare service sooner if symptoms are worsening, fever returns, you cannot keep fluids down, or you are passing less urine.

Seek emergency care for:

These symptoms can have several causes, but they need urgent assessment.

- Trouble breathing or rapidly worsening shortness of breath
- Coughing up blood
- Confusion, a seizure, collapse, or difficulty waking
- Very little or no urine
- Yellow skin or eyes with worsening illness
- Heavy or unexplained bleeding

- Severe weakness, fainting, or signs of shock
- A severe headache with a stiff neck or altered awareness

Common questions

Can I catch leptospirosis from another person?

Person-to-person transmission is very rare. Most infections come from water, soil, or surfaces contaminated by the urine of an infected animal. Ordinary social contact does not usually spread it.

Can I get leptospirosis from swimming in a lake or river?

Yes, if the water is contaminated with infected animal urine. Risk is higher in warm freshwater, after heavy rain, and where livestock or rodents are common. A single swim does not mean you have been infected.

How soon after exposure do symptoms start?

Symptoms commonly start within several days to a few weeks. Because this window is broad, tell a healthcare professional about relevant water, flood, animal, work, and travel exposures from the previous month.

Will leptospirosis go away without antibiotics?

Some mild infections may settle, but it is not possible to predict safely who will develop organ complications. Antibiotics are used to treat suspected or confirmed infection, and worsening symptoms need reassessment.

Can dogs give leptospirosis to people?

Dogs can become infected and may release the bacteria in urine. Direct transmission to people is uncommon, but precautions are important when handling urine from a dog that may be infected. Veterinary care and careful cleaning reduce risk.

Can I get leptospirosis more than once?

Yes. Infection may provide protection mainly against the particular bacterial type involved. It may not protect you from other types, so the same exposure precautions remain important after recovery.

Sources

- Centers for Disease Control and Prevention: About Leptospirosis
- Centers for Disease Control and Prevention: Clinical Overview of Leptospirosis
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- Haake DA, Levett PN. Leptospirosis in Humans. Current Topics in Microbiology and Immunology. 2015;387:65-97
- UK Health Security Agency: Leptospirosis-Guidance and Information