CONDITION

Brucellosis

Learn how brucellosis spreads, what symptoms it can cause, how it is diagnosed and treated, and when to seek urgent medical care.

WHAT IT IS
Brucella bacterial infection

BODY SYSTEM
Whole body

MAIN SYMPTOMS
Fever, heavy sweating, tiredness, muscle or joint pain

WHAT CAUSES IT
Infection with Brucella bacteria

HOW IT IS DIAGNOSED
Blood cultures, paired antibody blood tests

MAIN TREATMENT
Combination antibiotics

CAN IT BE CURED?
Yes, with full antibiotic treatment

IS IT AN EMERGENCY?
Sometimes, confusion or trouble breathing

LONG-TERM OUTLOOK
Symptoms may persist or relapse after treatment

Overview

Brucellosis is an infection caused by Brucella bacteria. These bacteria mainly infect animals, including cattle, goats, sheep, pigs, dogs, and wildlife. People can become infected through contact with infected animals or animal products.

A common route of infection is eating or drinking unpasteurized dairy products. Pasteurization uses heat to kill harmful germs. Brucellosis can also spread when bacteria enter the body through broken skin, the eyes, or the lungs. This may happen during animal care, meat processing, hunting, or laboratory work.

Brucellosis matters because it can affect many parts of the body. Some people have a short illness with fever, sweating, and body aches. Others develop symptoms that last for months or return after treatment. The infection can sometimes involve bones, joints, the nervous system,

reproductive organs, or heart valves.

Brucellosis is uncommon in many countries with livestock vaccination and food-safety programs. However, it remains an important health concern in parts of the Mediterranean region, the Middle East, Africa, Asia, and Latin America. Travel, imported foods, occupational exposure, and contact with feral swine can create risk even in places where the disease is uncommon.

Antibiotics like amoxicillin or doxycycline can treat brucellosis. Because the bacteria can survive inside human cells, treatment usually requires more than one antibiotic and lasts several weeks or longer.

Symptoms

Symptoms may begin within several weeks of exposure, although they can appear sooner or months later. They often resemble the flu or another general infection, so symptoms alone cannot confirm brucellosis.

Common symptoms include:

Some people have an "undulating" fever. This means the temperature rises and falls over time rather than remaining steady. A person may feel better for a period and then become ill again.

Brucellosis may cause more focused symptoms when a particular organ is affected. Pain in the lower back, hip, or another joint may occur if the infection involves bones or joints. Abdominal discomfort can develop if the liver or spleen becomes enlarged. Inflammation of a testicle and the nearby coiled tube, called the epididymis, can cause one-sided scrotal pain and swelling.

Nervous system involvement may cause severe headache, neck stiffness, confusion, weakness, or changes in sensation. Infection of a heart valve, called endocarditis, may cause ongoing fever, shortness of breath, chest discomfort, swelling, or unusual tiredness.

These symptoms have many possible causes. A clinician will consider the pattern of illness together with travel, food, animal, hunting, and workplace exposures.

- Fever, which may come and go
- Heavy sweating, sometimes with a strong odor
- Chills
- Tiredness or weakness
- Headache
- Loss of appetite or weight loss

- Muscle, back, or joint pain
- A general sense of being unwell

Causes and risk factors

People usually develop brucellosis after exposure to an infected animal or material contaminated by one. The bacteria do not normally spread through casual contact between people.

Important routes of exposure include:

Several Brucella species can infect people. Brucella melitensis is associated mainly with goats and sheep, B. abortus with cattle, B. suis with pigs, and B. canis with dogs. The animal sources and likelihood of severe illness vary by species.

People at increased risk include veterinarians, farmers, ranchers, slaughterhouse workers, meat-processing workers, animal-care staff, microbiology laboratory personnel, and hunters who handle feral swine. Travelers may be exposed through unpasteurized dairy products, even when the food looks or tastes normal.

Person-to-person transmission is rare. It has been reported through breastfeeding, sexual contact, blood transfusion, tissue transplantation, and exposure around childbirth. Brucellosis does not usually require a person to isolate from family members. However, someone who is pregnant, breastfeeding, donating blood, or concerned about sexual transmission should discuss precautions with a clinician.

There is no vaccine for people. Prevention depends on consuming pasteurized dairy products, using protective equipment when handling potentially infected animals, and following workplace or laboratory safety procedures. Gloves and eye protection may be appropriate when handling animal reproductive tissues or carcasses. Hunters should avoid direct contact between animal fluids and open cuts.

- Drinking raw, or unpasteurized, milk
- Eating unpasteurized cheese, ice cream, or other dairy products
- Handling animal blood, birth tissues, placentas, fetuses, or body fluids
- Butchering, field-dressing, or processing infected animals
- Breathing in bacteria in a laboratory, slaughterhouse, or similar setting
- Allowing contaminated material to contact broken skin or the eyes

Diagnosis

A clinician may suspect brucellosis when compatible symptoms occur after an animal, food, laboratory, or travel exposure. Because the symptoms overlap with many other illnesses, laboratory testing is needed.

Tell the healthcare team about:

Blood cultures may identify Brucella bacteria and can provide strong evidence of infection. However, the bacteria may grow slowly, and cultures can be negative, especially after antibiotics have been started. Samples from bone marrow, joint fluid, or other affected sites may sometimes be tested.

Blood tests can also measure antibodies made by the immune system against Brucella . A clinician may compare samples collected at different times to look for a meaningful change. Antibodies can remain detectable after an earlier infection, so one positive antibody result does not always prove that current symptoms are caused by active brucellosis. Specialized molecular tests may be available in some settings.

The medical team should alert the laboratory when brucellosis is suspected. Brucella can spread through tiny airborne particles during laboratory handling, so staff need specific safety precautions.

Additional tests depend on the symptoms. These may include blood counts, liver tests, imaging of painful bones or joints, an ultrasound of the heart, or testing of spinal fluid when nervous system infection is a concern.

- Countries or regions recently visited
- Raw milk, cheese, or other unpasteurized foods consumed
- Contact with livestock, dogs, wildlife, or animal birth products
- Hunting or field-dressing feral swine
- Veterinary, farming, slaughterhouse, or laboratory work
- When the possible exposure and symptoms occurred

Treatment and management

Brucellosis is treated with antibiotics. Clinicians generally use a combination of medicines because treatment with only one antibiotic has a higher chance of failing or being followed by relapse.

For uncomplicated infection in an adult, commonly used combinations may include doxycycline with rifampin. In some situations, an aminoglycoside antibiotic, such as gentamicin or streptomycin, is included. Treatment often lasts at least six weeks, but the exact medicines and duration depend on the person's age, pregnancy status, other medical conditions, likely Brucella species, and the organs involved.

Children and pregnant people require special treatment planning because some antibiotics are not suitable in every age group or stage of pregnancy. Treatment should be selected by a clinician familiar with the individual situation rather than based on a general regimen.

Infection involving the spine, nervous system, or heart valves often needs a longer course and closer monitoring. Heart valve infection may require both antibiotics and surgery. A collection of infected fluid or another localized complication may occasionally need drainage or a procedure.

It is important to take antibiotics for the full prescribed period, even if fever and pain improve quickly. Stopping early or missing repeated doses can make relapse more likely. If a dose is missed, follow the instructions from the prescriber or pharmacist rather than doubling a dose without advice.

Antibiotics can cause side effects. Depending on the medicines used, the care team may order blood tests to monitor the liver, kidneys, or blood cell counts. Contact the prescriber promptly about a new rash, severe diarrhea, repeated vomiting, yellow skin or eyes, dark urine, hearing changes, severe dizziness, or other concerning symptoms. Emergency help is appropriate for trouble breathing, facial or throat swelling, or another sign of a severe allergic reaction.

Rest, fluids, and appropriate pain or fever relief may support recovery, but they do not replace antibiotics. The clinician or pharmacist can advise which nonprescription medicines are compatible with the treatment plan.

Complications

Without effective treatment, brucellosis can persist or affect a specific organ. Complications can also occur despite initial therapy, particularly when diagnosis is delayed or an infection site is difficult for antibiotics to reach.

Possible complications include:

Endocarditis is uncommon, but it is the main cause of brucellosis-related deaths. Prompt evaluation of symptoms suggesting heart, nervous system, or spinal involvement can help the healthcare team identify complications early.

- Infection of bones, joints, or the spine
- Inflammation of the brain or tissues surrounding the brain and spinal cord
- Infection of a heart valve
- Liver or spleen inflammation
- Epididymal or testicular inflammation
- Persistent fatigue, pain, or reduced function
- Pregnancy complications
- Relapse after treatment

Follow up

Follow-up helps the care team confirm that symptoms are improving, check for medicine side effects, and look for evidence of a complication or relapse. The timing and tests needed depend on the type of infection and treatment used.

Fever may improve before tiredness, appetite, and strength fully return. Joint or back discomfort can also take time to settle. Keep follow-up appointments and tell the clinician if symptoms remain unchanged, worsen, or return after treatment.

A positive antibody test may persist even after successful treatment. For this reason, clinicians do not usually interpret follow-up blood tests without considering symptoms, examination findings, and previous results.

Contact the treating clinician promptly for a returning fever, worsening sweats, new localized bone or joint pain, joint swelling, jaundice, repeated vomiting, or new testicular pain or swelling. Pregnant people with a possible exposure or symptoms should seek timely medical advice.

Seek emergency care for:

After recovery, reduce the chance of another exposure by avoiding unpasteurized dairy products and using recommended protective equipment around animal tissues and fluids. If the exposure occurred at work, the employer or occupational health service may need to review safety procedures. Suspected laboratory exposure requires prompt occupational health and public health assessment, even before symptoms develop.

- Trouble breathing, chest pain, fainting, or blue or gray lips
- Confusion, a seizure, new weakness, or difficulty speaking
- A severe headache with neck stiffness or marked drowsiness

- Signs of a severe allergic reaction, such as throat swelling or breathing difficulty

Sources

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