[dkpdf-button]

## What is brucellosis?

Brucellosis is a disease caused by the bacterium *Brucella* that affects many types of animals, including sheep, goats, cattle, deer, elk, pigs, and dogs. There are multiple species of *Brucella*, including *B. melitensis, B. abortus, B. suis* and *B. canis*.

## Who gets brucellosis?

Brucellosis is found throughout the world, but is more common in certain areas, including the Mediterranean Basin (Portugal, Spain, Southern France, Italy, Greece, Turkey, North Africa), Mexico, South and Central America, Eastern Europe, Asia, Africa, the Caribbean, and the Middle East. In the United States, brucellosis is uncommon, with 100–200 cases occurring each year. In Virginia, an average of one case of brucellosis occurs each year and the cases are usually associated with eating imported, unpasteurized dairy products (such as cheeses). Certain groups of people are at higher risk of getting brucellosis, including people who work in slaughterhouses or the meat-packing industry, veterinarians, laboratory workers, and hunters.

## How is brucellosis spread?

People can become infected by eating or drinking unpasteurized milk or milk products (such as cheeses), having the bacteria enter the body through a skin wound, eye, nose or mouth after close contact with body fluids or tissues from an infected animal, or breathing in the organism (uncommon, but can occur among laboratory workers). Person-to-person spread of *Brucella* is extremely rare, but can occur through sexual contact with an infected person, by having infected tissues transplanted into the body, or by the bacteria passing from an infected mother to her infant during breastfeeding.

## How is *Brucella* spread in the laboratory?

Brucellosis is one of the most commonly reported laboratory-acquired infections. The low infectious dose (10–100 *Brucella* organisms), ease of aerosolizing organisms during routine laboratory procedures, and practice of manipulating *Brucella* isolates on an open bench (not under BSL-3 conditions) might partly explain this finding. Some laboratorians developed brucellosis after laboratory accidents, such as dropped culture plates or broken centrifuge tubes. Other infections have been linked to sniffing culture plates, mouth pipetting, and performing routine laboratory work outside of a biological safety cabinet (BSC). Procedures that generate aerosols can transmit the *Brucella* organisms to anyone nearby. The Centers for Disease Control and Prevention (CDC) recommends that laboratorians handle *Brucella* isolates in a class II or higher BSC and wear appropriate personal protective equipment (e.g., gloves, gown, and eye protection).

## Which laboratorians are at risk of becoming infected?

The risk of becoming infected in a laboratory depends on the activities that are performed on the clinical specimen or the *Brucella* isolate, the location of these activities, and who was in the laboratory at the time of the activities. With this information, the person's risk of exposure to

*Brucella* can be classified into three categories: minimal (but not zero), low, and high. These exposure risk categories are described on the CDC webpage for brucellosis laboratory risk levels.

## What are the symptoms of brucellosis?

Brucellosis initially causes a flu-like illness with fever, chills, headache, fatigue, and pain in the muscles, joints, or back. The fever might go up and down over a 24-hour period (another name for brucellosis is 'undulant fever'). Other symptoms can include loss of appetite and weight loss. Brucellosis can also cause long-lasting (chronic) symptoms including recurrent fever, chronic tiredness, and swelling in other body parts, such as the joints, testicle and scrotum area, lining of the heart, liver, spleen, brain, or spinal cord. Although rare, death can occur.

## How soon after exposure do symptoms appear?

Symptoms usually develop 2–4 weeks after exposure, with a range of 5 days–6 months.

## If I have been exposed to *Brucella*, should I watch for symptoms of brucellosis?

Yes. Those with low- or high-risk exposures to *Brucella* should perform daily self-checks for fever and monitor for other symptoms of brucellosis (e.g., chills, tiredness, severe or persistent headache, muscle pain, joint pain, unintended weight loss, loss of appetite, vomiting, and diarrhea) weekly for 24 weeks after the last known exposure. If you develop a fever, with or without any other symptom, you should contact your healthcare provider immediately for evaluation. Be sure to mention that you might have been exposed to *Brucella*. Because it can take a while for symptoms to develop, it is important that you monitor yourself for the entire 24 weeks.

## How is brucellosis diagnosed?

Brucellosis is diagnosed by identifying *Brucella* organisms in blood, bone marrow, or other body fluids. Serologic testing can be used to detect antibodies against most *Brucella* species (except *B. canis* and the *B. abortus* RB51 vaccine strain) in acute and convalescent serum specimens that are collected at least two weeks apart.

For laboratory workers with low- or high-risk exposures who do not have symptoms, serologic monitoring is recommended to detect asymptomatic or early infections before symptoms develop. Antibody levels should be assessed serially for 6 months (e.g., at 0, 6, 12, 18 and 24 weeks after exposure). Laboratorians with low- or high-risk exposures should also perform daily self-checks for fever and regular symptom watch (e.g., weekly).

## What is the treatment for brucellosis?

Brucellosis is treated with a combination of antibiotics. It is very important to take the medications as directed by the healthcare provider and for the whole time, even if the symptoms go away.

Otherwise, patients might experience a relapse that might be harder to treat. Depending on the timing of treatment and severity of illness, recovery might take a few weeks to several months.

## How can brucellosis be prevented in the laboratory?

- When brucellosis is suspected in a patient, the healthcare provider should note “suspect or rule out brucellosis” on the laboratory submission.
- Review laboratory containment methods and microbiological procedures to ensure compliance with recommendations in the Biosafety in Microbiological and Biomedical Laboratories (BMBL) 5th Edition (https://www.cdc.gov/biosafety/publications/bmbl5/.)
- Use primary barriers: use safety centrifuge cups, personal protective equipment, and class II or higher BSCs for procedures with a high likelihood of producing droplet splashes or aerosols.
- Use secondary barriers: restrict access to the laboratory when work is being performed and maintain the integrity of the laboratory’s air handling system by keeping external doors and windows closed.
- Perform all procedures on unidentified isolates carefully to minimize the creation of splashes or aerosols.
- Prohibit sniffing of opened culture plates to assist in the identification of isolates.
- Manipulate isolates of small gram-negative or gram-variable rods within a BSC.
- For some laboratorians who are accidentally exposed to *Brucella*, post-exposure prophylaxis might be recommended to prevent disease.

## Can prophylactic treatment be used to prevent brucellosis?

Yes. Post-exposure prophylaxis (PEP) in the form of a combination of antibiotics can be used to prevent brucellosis. PEP is recommended for laboratorians with high-risk exposures and can be considered for those with low-risk exposures who are immuno-compromised or pregnant. PEP should be discussed with the person’s healthcare provider.

## How can I get more information about brucellosis?

- If you have concerns about brucellosis, contact your healthcare provider.
- Call your local health department. A directory of local health departments is located at the VDH Local Health Districts page.
- Visit the Centers for Disease Control and Prevention website at the CDC page on brucellosis. The CDC has a brucellosis reference guide in PDF format.

**Brucellosis: Overview for Health Care Providers**

Two page summary of: Organism, Reporting, Infectious Dose, Occurrence, Natural Reservoir, Route of Infection, Communicability, Case-fatality Rate, Risk Factors, Incubation Period, Clinical Manifestations, Differential Diagnosis, Laboratory Tests/Sample Collection, Treatment, Vaccine

**Brucellosis: Guidance for Health Care Providers**

Key Medical and Public Health Interventions After Identification of a Suspected Case

February 2019

Opens pdf to download

Opens document to download

Opens in a new window

External link will open in new window.  Click link to exit Virginia Department of Health Website.