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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 worldwide, but is more common in certain countries in Africa, Asia, and Central America. In the United States, there are 100–200 cases reported each year. Virginia reports fewer than five cases each year and they are usually associated with eating imported, unpasteurized dairy products (such as raw cheese). 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 after having contact with infected animals or animal products. These include:

- Eating undercooked meat and game meat such as sheep, cow, goat, bison, elk, caribou, moose, and wild hog.
- Consuming unpasteurized (raw) milk or other dairy products made from contaminated milk.
- Breathing in the bacteria that cause brucellosis.
- Getting body fluids from infected animals in the eyes, nose, or mouth.
- Preparing meat or hides after hunting.
- Getting certain animal vaccines in the eyes, nose or mouth or accidentally injecting yourself when vaccinating animals.
- Working in a lab with brucellosis samples.

It is extremely rare for brucellosis to spread between people.

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 (instead of at biosafety level 3 conditions) may partially explain this finding. Some laboratory workers develop brucellosis after laboratory accidents, such as dropped culture plates or broken centrifuge tubes. Other infections have been linked to sniffing culture plates (sometimes used to help identify isolates), 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.

Which laboratory workers are at risk of becoming infected?

The risk of becoming infected in a laboratory depends on the activities 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 CDC's webpage for brucellosis laboratory risk levels at cdc.gov/brucellosis/media/pdfs/brucellosis-risk-assessment-chart.pdf.

What are the symptoms of brucellosis?

The first symptoms of brucellosis usually include fever, chills, headache, fatigue, loss of appetite, and pain in the muscles, joints, or back. Brucellosis can also cause long-lasting (chronic) symptoms, including recurrent fever, chronic tiredness, memory loss, 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 two to four weeks after exposure, with a range of five days to six 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 symptoms of brucellosis for 6 months after the last known exposure. If you develop a fever, with or without any other symptoms, you should contact a 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 6 months.

How is brucellosis diagnosed?

Brucellosis is diagnosed by identifying *Brucella* organisms in blood, bone marrow, or other body fluids.

Tests can also be done to check for the presence of antibodies. This is recommended for laboratory workers with low- or high-risk exposures who do not have symptoms (asymptomatic) to help detect asymptomatic or early infections before symptoms develop.

What is the treatment for brucellosis?

Brucellosis is treated with antibiotics for at least six to eight weeks. It is very important to take the medications as directed by the healthcare provider and finish them, even if the symptoms go away. Otherwise, patients might experience a relapse that is harder to treat. Depending on when

treatment is started and severity of illness, recovery may take a few weeks to several months.

Do people who have been in contact with someone with brucellosis infection need to be tested and treated?

In certain occupational settings, contacts of individuals with brucellosis may be recommended for testing and treatment.

How can brucellosis infection be prevented?

- Review and comply with the recommended laboratory containment methods and microbiological procedures found in the Biosafety in Microbiological and Biomedical Laboratories (BMBL) Sixth Edition. Find the procedures at cdc.gov/labs/bmbl/index.html.
- Use primary barriers: use safety centrifuge cups, personal protective equipment, and class II or higher BSC 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 splashes and aerosols.
- Prohibit sniffing of open culture plates.
- Manipulate isolates of small gram-negative or gram-variable rods within a BSC.

Can postexposure prophylaxis be used to prevent brucellosis after an exposure?

Yes. Postexposure prophylaxis (PEP) antibiotics can be used to prevent brucellosis. PEP is recommended for laboratory workers with high-risk exposures and can be considered for those with low-risk exposures who are immunocompromised 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. You can find your local health department by visiting the VDH Health Department Locator at <u>vdh.virginia.gov/health-department-locator/</u>.
- Visit the CDC page on brucellosis at <u>cdc.gov/brucellosis/</u>. CDC has a brucellosis reference guide in PDF format at <u>cdc.gov/brucellosis/pdf/brucellosi-reference-guide.pdf</u>
- For Healthcare Providers
 - <u>Brucellosis: Overview for Health Care Providers</u>: A two-page quick reference guide with basic information and recommendations for treatment and postexposure prophylaxis.
 - <u>Brucellosis: Guidance for Health Care Providers</u>: A comprehensive summary of the key medical and public health interventions to pursue after the identification of a suspected case.

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