



## Canine Brucellosis: Facts for Dog Owners

### Canine Brucellosis

Canine brucellosis is an infectious disease caused by the bacteria *Brucella canis*. There are other species of *Brucella* that affect different animals, and a few of these can also infect dogs, but *B. canis* is the most common *Brucella* species found in infected dogs. Besides being infectious to other dogs, *B. canis* is a zoonotic disease, meaning that people can catch the disease from infected animals.

### Clinical Signs in Dogs

The most common clinical signs associated with canine brucellosis in female dogs are late-term abortion, and stillborn puppies. Live puppies that are born to an infected bitch may die within a few hours or days. Infected male dogs may have abnormally sized testicles (swollen or shrunken). Other signs observed with canine brucellosis include infertility, anorexia, weight loss, pain, lameness, incoordination, swollen lymph nodes, and muscle weakness.

### Transmission Between Dogs

*B. canis* organisms are passed in urine, vaginal discharge, semen, aborted material (this contains the highest concentration of organisms), milk, nasal secretions, and saliva. Dogs usually catch the disease when they eat contaminated materials (afterbirth tissue) or when mucous membranes come in contact with vaginal discharge from an infected bitch during mating. The disease may also be transmitted to the female via infected semen. Puppies can become infected in utero or during nursing.

### Diagnosing Dogs with Canine Brucellosis

Your pet may need to be tested for *B. canis* under the following circumstances: your veterinarian suspects brucellosis because of your pet's clinical signs; you're moving to a state that requires testing prior to entry; you or a family member have been diagnosed with canine brucellosis and are concerned that your pet may be the source of the infection; you are concerned that your pet was exposed to a dog that is infected with *B. canis*; you want to breed your dog (testing for *B. canis* is recommended prior to breeding).

Canine brucellosis can be difficult to diagnose, and usually more than one test is needed for an accurate diagnosis. Several different tests are used to diagnose *B. canis* in dogs. Serological tests look for antibodies in the blood, indicating that the pet has been exposed. If it is too early in the course of infection, the test may be falsely negative, because the pet's immune system hasn't had enough time to produce antibodies yet. Sometimes these tests are falsely positive, because the test reacts with antibodies to other bacteria that are not in the *Brucella* family.

A culture is considered the gold standard test for diagnosing *B. canis* infection. This is when fluids (e.g., blood, semen, vaginal secretions, milk, urine) or tissues (e.g., placenta, aborted fetuses, biopsy samples) are sent to a lab where the sample is incubated in a special substance (media) to see if bacteria grow. When a colony of bacteria does grow, microbiologists will examine the bacteria to determine the exact type (species) that has grown. Sometimes this test will be negative in an infected dog because the dog was recently treated with antibiotics, or because the pet isn't shedding the bacteria at the time the test was done.

Your veterinarian will know the best tests to run for each specific case.

### **Transmission from Dogs to People**

People can become infected via contact with fluids and tissues from infected dogs. Transmission may occur through accidental contact between these infectious materials and the person's mucous membranes, or a break in the person's skin. The risk is highest when assisting an infected bitch giving birth, cleaning up after the puppies are born to an infected bitch (whether live or stillborn), or cleaning up after a spontaneous abortion. People appear to be relatively resistant to infection with *B. canis* compared to other *Brucella* species, and the overall rate of infection in people seems to be low; however, people do get infected and may become ill. It is also believed by many experts that there are more cases of human infections than we are aware of, due to under-reporting and a lack of reliable diagnostic tests for human infections. The exact level of risk to humans is uncertain.

### **Clinical Signs of Canine Brucellosis in People**

The most common signs we see with human infection include fever, chills, lethargy, headache, weakness, muscle aches, and swollen lymph nodes. In more severe infections, joints, bones, or heart valves may be affected. Signs may appear anywhere from 3 weeks up to several months after infection. People who may have been exposed to *B. canis* from their dog should consult with their physician, especially if they are showing clinical signs compatible with brucellosis. It is important to let their physician know about the canine brucellosis exposure. Children and immunosuppressed individuals may be at the highest risk of infection. It is important to know that currently available human antibody tests for brucellosis cannot detect antibodies to *Brucella canis*. These tests work when people are infected by a different species of *Brucella*, but not *B. canis*. For this reason it is important to consult with your physician about performing other diagnostic tests, such as a blood culture. Physicians can contact the New Jersey Department of Health for information on appropriate Brucellosis testing.

### **Treating Dogs with Canine Brucellosis**

Brucellosis is considered a lifelong infection in dogs. Treatment of infected animals consists of surgical sterilization (spaying/neutering) and long-term antibiotic therapy. Treatment usually consists of a combination of antibiotics, given for at least 4-12 weeks, but treatment is often unsuccessful. Even when treatment appears successful (tests are negative after treatment), relapse is common, and the dog becomes contagious again. Dogs may continue to shed the organism intermittently, for as long as 5.5 years even after long-term antibiotic use. Periodic testing should be done to monitor the course of the disease. Treatment is even more difficult in male dogs, because the prostate gland becomes chronically infected. Euthanasia of infected animals is often recommended in kennels, and is also considered an option in pets, due to the ongoing potential risk that these dogs carry for infecting people, other dogs,

and other susceptible animal species. Treatment and monitoring with periodic diagnostic tests can be expensive, and taking measures to prevent further transmission to people and other dogs can prove difficult for many pet owners.

## Prevention

There is no vaccine available to prevent canine brucellosis in dogs or in people. Prevention consists of yearly testing of all breeding dogs, testing all dogs introduced for breeding, only breeding non-infected dogs, adhering to strict cleaning and disinfecting protocols, using personal protective equipment (including gloves and mask) when assisting whelping dogs, and requesting testing before adopting, or by purchasing dogs from reputable breeders only.

## Prevention of Further Spread of Disease after Pet is Diagnosed

Humane euthanasia of infected dogs is often recommended to prevent the spread of this disease. For pet dogs that become infected and are not euthanized, owners should understand the ongoing potential risk that their pet carries for infecting other dogs, people, and other susceptible species. They need to take measures to prevent other dogs or people from becoming infected. Owners should be encouraged to consult with their physician if they are considering keeping the pet, especially if there are young children, pregnant women, or immunocompromised individuals in the household.

The pet should be neutered in an effort to decrease the shedding of the organism via reproductive secretions. The dog should be treated with proper antibiotics, often for as long as 12 weeks, and re-tested to determine if the pet is still shedding the organism. The pet should be kept away from other dogs and visitors. It is recommended to periodically test infected animals to monitor their disease. Infected dogs should never be bred. Good hygiene should be practiced, including wearing gloves when cleaning up pet waste and washing hands thoroughly afterward. Contaminated clothing and dog bedding should be laundered frequently. Contaminated surfaces should be disinfected. *B. canis* is short-lived outside of the body. It is readily inactivated by common disinfectants and sunlight. It is, however, stable in the environment in the presence of organic debris (feces, dirt, bedding) for up to 2 months. It can withstand freezing and can survive in water, dust, and soil. **The pet should not be taken to public areas such as parks, beaches, playgrounds, doggie day-care facilities, pet stores, etc. Owners should not allow the dog to mouth, or “kiss” people.** Owners should be cautioned against allowing the infected pet to have contact with children, pregnant women, and immunocompromised people, as these individuals may be more susceptible to contracting the disease. Owners of infected pets need to warn their veterinarian of the dog’s diagnosis so that the veterinary staff can take precautions to protect themselves.

This information is intended for educational purposes only and is not intended to replace consultation with a health care or veterinary professional.

**Additional Resources:**

Best Practices for *Brucella canis* Prevention and Control in Dog Breeding Facilities. USDA. 2015. ([www.aphis.usda.gov/animal\\_welfare/downloads/brucella\\_canis\\_prevention.pdf](http://www.aphis.usda.gov/animal_welfare/downloads/brucella_canis_prevention.pdf))

Hensel, M. E., Negron, M., & Arenas-Gamboa, A. M. (2018). Brucellosis in Dogs and Public Health Risk. *Emerging Infectious Diseases*, 24(8), 1401-1406. <https://dx.doi.org/10.3201/eid2408.171171>.

Public Health Implications of *Brucella canis* Infections in Humans. National association of State Public Health Veterinarians, March 2012. (<http://www.nasphv.org/Documents/BrucellaCanisInHumans.pdf>)

Brucellosis: *Brucella canis* (Contagious Abortion, Undulant Fever). May 2018. ([http://www.cfsph.iastate.edu/Factsheets/pdfs/brucellosis\\_canis.pdf](http://www.cfsph.iastate.edu/Factsheets/pdfs/brucellosis_canis.pdf))