Canine Brucellosis

Information for Dog Owners

Key Facts

Canine brucellosis is found world-wide. It is an increasing concern in North America due to importation of infected breeding dogs and semen for artificial insemination.

Disease in dogs can be:

- Subclinical, dogs frequently have no obvious disease signs.
- Associated with acute or chronic signs, such as:
  - Reproductive disease, e.g. abortion (typically late term), weak pups who die shortly after birth, infertility (bitch or stud)
  - Spine or neurologic disease, e.g. back or neck pain

Infection is poorly responsive to treatment.

Neutering alone will not cure an infected dog.

Breeding programs with infertility or abortion concerns should promptly test dogs. All breeding programs should have a routine testing schedule, especially for any new dogs.

Brucellosis is a zoonotic disease. Infected dogs can infect people and in many jurisdictions it is reportable to animal and public health agencies.

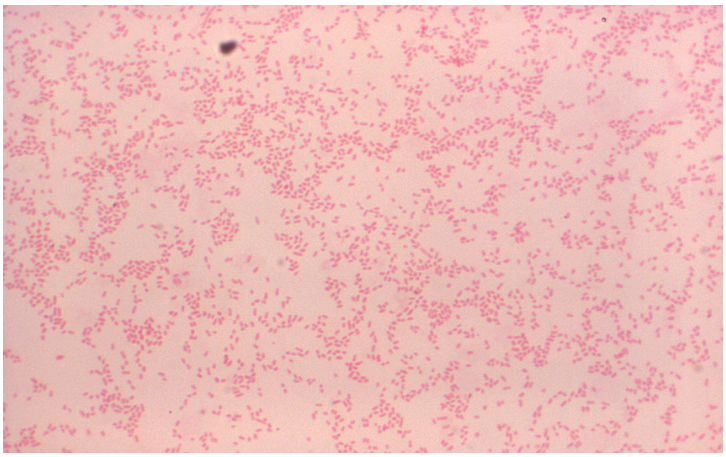
What is it?

Brucellosis is due to infection with the *Brucella* bacterium. *Brucella canis* is the most common species found in dogs. It is most often transmitted through direct dog-to-dog contact via infected body fluids and tissues (e.g. vaginal discharge, aborted fetus, placenta, semen, urine).

Other *Brucella* spp. can also infect dogs (including *Brucella abortus* and *Brucella suis*) after dogs consume placenta, aborted fetuses, or uncooked meat from infected livestock or have contact with wild (feral) swine.

Once within the dog, the bacterium multiplies and circulates in the blood, moving to and multiplying in body organs. Bacteria can remain within the blood for many years and are easily shed in body fluids. This leads to a high risk of spread to other dogs, especially in dog kennels or dog group environments.

Brucellosis is the leading cause of reproductive disease in dogs. Although most infected dogs do not show signs of disease, they are able to infect other dogs. Signs of disease can occur shortly after infection or may not develop for months or years.



Brucella spp. under microscopic examination (Public Domain: Centers for Disease Control and Prevention)

Who gets it?

Dogs, wild dogs and humans may experience clinical disease once infected.

Can people get sick with it?

Yes. Although dogs rarely spread the infection to people, it does occur and infected people can become very sick. People likely to have contact with infected dogs and their body fluids (e.g. breeders, veterinary staff) are at greatest risk for infection.

How is it spread? (Transmission & Infection risk)

Canine brucellosis is most often transmitted through direct contact with infected vaginal discharge, aborted fetus, placenta, semen, or urine. Transmission after oral or nasal contact with an infected dog may also occur. Puppies can be infected *in utero* if born to an infected dam. In kennels or in high-density dog groups, transmission can occur through contact with contaminated objects (e.g. food or water bowls, bedding). Infected dogs will persistently shed *B. canis* in fluids for months and likely (intermittently) lifelong.

The bacteria can be found world-wide, but the southern USA, Mexico, South and Central America, China and Japan are considered higher risk areas. In many places, infected dogs are increasingly common, creating concern for disease emergence and spread.

Infection risk is highest for stray and breeding dogs, or those who live in a kennel. Outbreaks are often traced to the introduction of a new infected dog.

Infection with *B. suis* is most common in hunting dogs or those who have contact with wild (feral) swine. Although feral swine are increasingly common throughout much of the US, their population is highest (as is the prevalence of *B. suis* in feral swine) in the southern US.

What should I look for? (Signs of disease)

Reproductive disease (e.g. abortion, infertility, fading puppies) is the most common sign of infection. However, spinal and nervous system signs can occur, such as discospondylitis. Some infected dogs never develop clinical disease.

How is it diagnosed?

Your veterinarian will need to perform repeated testing (or use a combination of tests) to diagnose brucellosis. First, they will evaluate your dog's clinical signs and do a thorough physical examination to assess for reproductive or spinal disease. A history of being a stray, imported from a high-risk area (see *How is it spread?*), breeding dog or being from a kennel will increase their suspicion of brucellosis.

Usually, diagnosis is made through a combination of clinical signs, PCR and serology tests [e.g. rapid slide agglutination (RSAT, ME-RSAT), agar gel immunodiffusion (AGID)]. False positive tests are common, so confirmatory testing is **strongly** advised whenever a positive result is obtained. Some tests may not differentiate between *B. canis* and *B. suis*. Although both are important when identified, your veterinarian will want to determine which bacteria are causing disease to ensure appropriate treatment and management.

Semen may need to be tested prior to being imported in some regions. It is strongly advised to routinely test all breeding dogs to reduce disease and spread (see *How can I stop this from happening to my dog and other dogs*).

In many areas, canine brucellosis testing or identification requires reporting to the regional public or animal health agency, and these groups may request additional testing.

What is the treatment? Will my dog recover?

Unfortunately, therapy is rarely curative. Once dogs are infected they are usually infected for life. Neutering alone will not cure an infected dog. Treatment typically consists of neutering, appropriate antibiotics and pain relief. However, relapses are very common, despite appropriate therapy.

In kennels and breeding facilities, it is advised to immediately quarantine all dogs who are likely to have had contact (direct or through shared objects/environments) with an infected dog, as well as dogs with a positive screening test (see *Outbreak management*). In these facilities, dogs that are confirmed to have canine brucellosis (see *How is it diagnosed?*) should be removed or euthanized.

Prognosis for recovery is very poor, and it is challenging to eradicate disease from affected kennels and breeding colonies.

How can I stop this from happening to my dog and other dogs?

Be informed. Follow recommendations for testing of breeding dogs and semen, and do not allow untested dogs to enter kennels. Quarantine all new dogs (keep separated from other dogs) until they have been appropriately screened for canine brucellosis and other infectious diseases. Currently, no vaccination is available for dogs. The bacteria are easily killed with routine disinfectants (see Resources for additional information).

Current recommendations are to perform a minimum of annual testing on all breeding dogs and quarantine all new dogs prior to kennel entry. Ideally, two negative screening tests (30-60 days apart) should occur prior to admission of any new dog into a breeding kennel or obtaining semen from a dog outside the facility. Dogs bred intensively outside the facility should be tested 2-4 times per year. When run, tests should be conducted 3-4 weeks prior to the onset of estrus, as testing is more accurate near or during estrus and to allow time for a confirmation test if the screening test is positive.

Dogs used for blood donation should also be screened (once for neutered donors and annually in sexually active intact dogs).

Re-homing known infected dogs is generally discouraged, due to human health concerns.

Outbreak management:

Since canine brucellosis often goes unnoticed and the bacteria are shed in bodily secretions, the disease can quickly spread throughout a group of dogs (e.g. kennel) if the above testing recommendations are not followed.

When multiple dogs have been infected with *B. canis* in a single location (e.g. kennel), it is strongly recommended to contact someone with experience in veterinary infectious disease risk assessment and outbreak management (i.e. state veterinarian, expert at a nearby veterinary college).

Outbreaks are most likely to occur when numerous dogs are housed together, and an infected dog is inadvertently introduced (e.g. breeding program). In such cases, efforts should be aimed at systematically determining which dogs are infected (testing all dogs at least twice 30 days apart) and keeping dogs of different status (e.g. test negative, test positive once, confirmed positive) completely separated.

Screening programs will greatly reduce the chance of an outbreak and should be used by every breeder and those introducing high-risk dogs (e.g. stray, national/international rescue) into a dog group.

Zoonotic (Human Infection) Alert:

People can be infected and become sick with *Brucella* spp. People are infected with *B. canis* from contact with an infected dog, its fluids/tissues, or contaminated environment (e.g. bedding, kennel). Disease in people is similar to that in dogs, causing fever and damage to reproductive organs.

Disease prevention in people is dependent on quickly identifying infected dogs and taking precautions to avoid contact with the bacteria. These precautions should include washing hands, wearing gloves and dedicated clothing during whelping, and working with a veterinarian to integrate and follow a screening program for all dogs, along with quickly investigating any concerns of reproductive failure.

Additional Resources

Georgia Department of Agriculture. Canine brucellosis (*Brucella canis*). Available at: agr.georgia.gov/Data/Sites/1/media/ag_animalindustry/animal_health/files/caninebrucellosis.pdf

National Association of State Public Health Veterinarians. Public health implications of *Brucella canis* infections in humans. Available at: nasphv.org/documentsCompendia.html

Ramamoorthy, S., et al. (2011), *Brucella suis* infection in dogs, Georgia, USA. Emerg Infect Dis, 17: 2386-2387. Available at: dx.doi.org/10.3201/eid1712.111127

The Center for Food Security and Public Health. "Brucellosis" Technical Factsheet. Available at: cfsph.iastate.edu/

The United States Department of Agriculture. USDA Best Practices for *Brucella canis* Prevention and Control in Dog Breeding Facilities. October 2015. Available at: aphis.usda.gov/animal_welfare/downloads/brucella_canis_prevention.pdf

Wardrop, KJ, et al. (2016), Update on canine and feline blood donor screening for blood-borne pathogens. J Vet Intern Med 30.1: 15-35. Available at: onlinelibrary.wiley.com/page/journal/19391676/homepage/free_reviews_and_consensus_statements.htm

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For questions or inquiries please contact us at: chf@akcchf.org or 888-682-9696.

Access our full series of canine health fact sheets here: akcchf.org/canine-health/top-health-concerns/top-health-concerns.html

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