

ANIMAL AND HUMAN HEALTH PREVENTION OPPORTUNITIES

Brucellosis canis

Brucellosis canis is a zoonotic disease of dogs and wild Canidae. Experimentally infected species include cats, rabbits, and nonhuman primates. Humans can be infected with *B. canis*, but appear to be relatively resistant. The causative agent is a gram negative bacterium which is one of six species in the *Brucella* genus. The epidemiology of *B. canis* infections in humans is poorly understood. However, most reported infections have been mild so underreporting and underdiagnosing might occur.

In this issue of *Montana One Health*, we will describe the animal and human health implications of *B. canis* infections.

Animal *B. canis* Infections

B. canis has a worldwide distribution; however, New Zealand and Australia appear to be free of the organism. Of significant concern is the impact on canine reproduction, particularly in breeding kennels, and the zoonotic nature of the disease.

B. canis occurs in the reproductive tissues and fluids after a birth, abortion, or stillbirth including the fetus, placenta, fetal fluids, and vaginal discharge. The organism is also shed in milk, semen, and urine. Low concentrations of the bacteria have been reported in saliva, nasal and ocular secretions, and feces. The organism causes abortions, stillbirths, epididymitis, and orchitis in dogs. In spayed/neutered animals, non-reproductive signs include ocular disease and discospondylitis. The incubation period is variable in dogs, but abortions usually occur between 7–9 weeks of gestation.

B. canis can be difficult to diagnose and often requires multiple techniques used in combination. Testing options include serological tests, culture, and real-time polymerase chain reaction assays. Similar to other *Brucella* species, cross-reaction can occur on serological assays. No treatment option is guaranteed to eliminate an infection in a dog. All *B. canis* positive dogs should be spayed/neutered to reduce the risk of transmission; however these procedures alone do not reduce the risk of infection to humans and other dogs. Antibiotic treatment lasts for weeks and success is not guaranteed. Treatment of male dogs is especially difficult because the prostate gland is chronically infected. Treatment usually requires a combination of two different antibiotics for several weeks. The other option is euthanasia for infected dogs.

Canine brucellosis is an infrequent diagnosis in Montana with two confirmed cases occurring since 2011, both in neutered male dogs with active cases of discospondylitis.

Human *B. canis* Infections

The virulence of *B. canis* in humans has been considered low, as few cases have been documented. Human *B. canis* infections, like other *Brucella* genus infections, typically have non-specific flu-like symptoms including a fever which is often intermittent, fatigue, headache, weakness, malaise, chills, sweats, weight loss, hepatomegaly, splenomegaly, and lymphadenopathy. However, serious complications of an infection have been reported including septic arthritis, aortic valve vegetations, osteomyelitis, epidural abscess, pleural effusions, oral lesions, lower extremity aneurysms, and culture negative endocarditis.

Transmission to humans usually occurs by ingestion of the organism or via contamination of mucus membranes and abraded skin. *B. canis* infections in the literature have been described after close contact with infected dogs, especially animals that recently aborted or gave birth, and after exposure to the organism in a laboratory setting. No information about human-to-human transmission of *B. canis* exists; however other *Brucella* species are not transmitted between people by casual contact and transmission by other routes of infection is unusual. The incubation period for *B. canis* is unknown, however for other *Brucella* species symptoms usually occur within two weeks of exposure, but can be as long as three months after exposure.

Persons at-risk for an infection include dog breeders, veterinarians, veterinary technicians, in some instances laboratory workers, and any other individuals in contact with potentially infected dogs. Activities associated with the greatest risk of infection are whelping and any activity that brings a person in contact with birthing fluids, canine abortion products, or vaginal discharges from an infected dog.

Example of a dog kennel



Prevention of human infections includes proper personal protective equipment and good hand hygiene when handling a potentially infected dog or working in a *B. canis* infected kennel. Other prevention measures include annual *B. canis* testing for all breeding dogs, testing all dogs introduced for breeding, only breeding noninfected dogs, and purchasing dogs only from reputable kennels.

For infected pet dogs, measures exist that owners can take to reduce the risk of infection for humans and other dogs. However, no measure short of euthanasia should be considered absolutely effective.

Control measures include:

- A three step process of spaying/neutering the dog, antibiotic treatment, and retesting. Repetition of treatment might be necessary.
- Practice good hygiene. Wear gloves when cleaning up areas contaminated by dog feces or urine and wash hands thoroughly when done. Properly dispose of dog waste, and launder potentially contaminated clothing or dog blankets regularly. Contaminated wet areas can be disinfected with a 1% bleach solution.
- Do not take infected dogs to public areas such as parks, beaches, pet stores, or jogging paths.
- Limit the dog's contact to as few people as possible. Do not allow the dog to lick or "mouth" people or other dogs.

***Brucellosis canis* Key Points**

Animal Health

- Test all breeding dogs annually, all dogs introduced for breeding, and only breed noninfected dogs
- *B. canis* positive dogs in a breeding kennel should be euthanized
- Diagnosis and treatment of *B. canis* infected dogs can be difficult

Human Health

- If a person acquires a *B. canis* positive dog and elects not to euthanize, the diagnosis should be confirmed with their veterinarian, a treatment and testing plan instituted, and notification of public health authorities should occur to provide guidance on infection prevention measures
- Health care providers should report all suspected cases of brucellosis immediately to the local health departments (ARM 37.114.101)

References available on web version. Visit <http://www.dphhs.mt.gov/publichealth/publications.shtml>.

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