



Canine Brucellosis Guidance Document for Indiana Cases

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Table of Contents

| | |
|----------|---|
| Page 2 | Information on Canine Brucellosis |
| Page 3 | Treatment Options |
| Page 3 | Prevention |
| Page 4-5 | Quarantine and Isolation Facilities |
| Page 5 | Cleaning and Disinfecting Facilities |
| Page 6 | Testing |
| Page 6-7 | Zoonotic Potential |
| Page 7 | Indiana Rules Regarding Moving Diseased Animals |

Information on Canine Brucellosis

Canine brucellosis is a highly contagious, infectious disease of dogs. Infection is caused by a bacterium which is spread by contact with positive dogs. The disease is transmitted to other dogs through secretions from the reproductive tract, such as aborted puppies, urine, or vaginal secretions from infected dogs. The primary mode of transmission is through breeding.

Canine brucellosis is on the state of Indiana's reportable disease list. Laboratories, veterinarians and animal owners are required to report positive test results to the Indiana State Board of Animal Health (BOAH) within 2 business days after the diagnosis.

Clinical signs of canine brucellosis vary between male and female dogs. The most common signs in females are inability to conceive or abortion 6 weeks to 8 weeks into a pregnancy without any signs of illness. Males will exhibit tender, swollen or shrunken testicles, leading to infertility or poor reproductive ability. Both males and females may transmit the bacteria during the breeding process. Conception is possible for infected females, but pregnancies generally result in smaller litter sizes and/or weak, fading puppies.

The disease is zoonotic, meaning it can be transmitted to humans. Humans can acquire the bacteria when an infected dog's body fluids come in contact with broken skin or are accidentally ingested. Canine brucellosis in humans is characterized by flu-like symptoms, including fever, headache and lethargy.

Treatment Options

A vaccine is not available for canine brucellosis.

Infected males will always have the potential to shed bacteria, even after neutering. Infected females may stop shedding bacteria after being spayed; however, several months to years may pass after spaying before the female consistently tests negative for the bacteria.

Infected dogs given long-term treatment with antibiotics may test negative for infection temporarily. **Antibiotic treatment does not cure brucellosis infection.** Treatment can decrease the amount of circulating bacteria in the blood, causing the animal to test negative temporarily. However, the brucellosis bacteria remain in the animal, especially in the reproductive tract. Once antibiotic treatment is stopped, the bacteria multiply and the animal begins shedding bacteria again in large quantities. Treatment may allow brucellosis-infected dogs to continue to reproduce; however, the number of pups produced will be significantly lower than for uninfected dogs. Treatment can make dogs test negative for brucellosis, a method used by unethical breeders to sell positive dogs to unsuspecting buyers.

Puppies born to brucellosis-infected dams are likely to be infected with canine brucellosis. These puppies will be infected for life, posing a health risk to people and to other dogs.

In general, any dogs that test positive for brucellosis should be euthanized. In rare situations involving highly trained dogs, like law enforcement or service animals, special considerations and options may be reviewed in cooperation with the local health department, to determine if the infected animal can be salvaged while still protecting human and animal health.

Prevention

The best treatment is to prevent infection in the first place.

Breeding dogs should be purchased from kennels that are currently, actively screening and monitoring for brucellosis. All newly purchased dogs should be quarantined for 4 weeks to 6 weeks and tested at least once before they are incorporated into the breeding stock. BOAH recommends all breeding dogs be tested annually.

Care should be taken to maintain a dry and clean kennel and equipment. Dog caregivers should practice good hygiene by washing hands and changing soiled clothes between contact with different dogs.

Quarantine and Isolation Facilities

Properly using a quarantine facility is an important step in keeping unwanted organisms, such as bacteria, viruses and parasites, out of a kennel. All new animals should be placed in a quarantine facility until they have met established testing requirements for entering the kennel and a knowledgeable individual has observed them for at least 30 days. Dogs showing signs of illness should not be placed into the kennel.

Animals that become sick while in a kennel can easily spread disease or infection to other dogs. At the first sign of illness, the owner(s) should consider moving those animals to another area of the facility, such as an isolation room or building. Dogs can be treated in an isolation area with a lower risk of spreading infection to the remainder of the kennel population.

Things to consider when setting up a quarantine facility and/or isolation facility include:

- A **quarantine facility** should be used only for the temporary housing and observation of recently purchased dogs, before they are introduced to the main kennel.
- An **isolation facility** should be used only for the temporary housing of dogs showing clinical signs of illness and for the duration of their treatment.
- Isolation and quarantine spaces should be kept separate. Co-locating these functions will present a risk of exposing new or existing dogs to illness.
- The best locations of these facilities will allow animals to be easily moved into and out of the areas without exposing healthy animals.
- Access to the quarantine and isolation facilities should be limited to necessary individuals only, such as one person needed to care for the dogs. If the same person caring for dogs in the kennel is also caring for dogs in the quarantine and isolation area, extra care should be taken for good biosecurity when going between the two areas.
- A sink located inside each facility for hand washing, treatments and disinfection purposes.
- Air flow to these areas should be separated from other animal housing areas to avoid spreading airborne infections.
- Materials and surfaces should be easy to clean and disinfect.
- Complete separation must be maintained from all other animals' living spaces within the quarantine and isolation areas (i.e., solid walls between cages or kennels).
- Separate equipment and supplies must be used exclusively for the quarantine and isolation areas.
- Anyone entering these areas should wear personal protective equipment, such as:
 - Plastic boots, shoe covers or boots to be worn only in this area,
 - Coveralls to be worn over clothes when in this area, and
 - Gloves.

- Cleaning and caring for the animals in quarantine, then isolation, should be done only after tending to all of the other animals in the kennel. This reduces the risk of spreading illness or disease.
- Facilities must be cleaned and disinfected following the removal of all animals and before introduction of new animals.

Cleaning and Disinfecting Facilities

Brucellosis can be easily spread from dog to dog through birth fluids, urine, and other body fluids. To prevent reintroduction of infection, animal owners must maintain strict cleaning and disinfecting procedures. **REMOVAL OF ALL FECAL MATERIAL, URINE, AND DEBRIS PRIOR TO DISINFECTION PROCEDURES IS ABSOLUTELY ESSENTIAL.** All equipment and facilities on the premise should be cleaned and disinfected on a routine basis and following all infectious disease outbreaks.

Cleaning is the act of removing fecal material, urine, and debris from the area using a cleaning solution or detergent such as soap.

Disinfection is the act of removing pathogens, such as bacteria, viruses and parasites, by using a disinfecting product. Most disinfecting products must be left on clean surfaces for a specific amount of time to be effective in removing the pathogen. Users must read and follow the label directions when using a product in the kennel.

The following products are considered to be effective for disinfection:

- **Household Bleach:** a 1:32 dilution is best for routine disinfection – ½ cup bleach per gallon of water; a 1:10 dilution – 1 ½ cups of bleach per gallon of water may be necessary following a diagnosis of brucellosis or other disease to deep clean the kennel. This solution can have a strong odor, so users should wear a mask when using a 1:10 solution and remove all dogs from the area until the product is rinsed.
- **Phenolic Disinfectants:** Lysol, One Stroke Environ – Follow label directions for dilution and necessary contact time.
- **Quaternary Ammonia Compounds:** Roccal D, Parvosol – Follow label directions for dilution and necessary contact time.

REMEMBER: MOST SURFACES SHOULD BE RINSED FOLLOWING PRODUCT APPLICATION BEFORE ANIMALS ARE PLACED BACK INTO THE AREA. FOLLOW THE LABEL RECOMMENDATIONS.

Testing

Only veterinarians may submit samples to a laboratory for a recognized test.

All dogs potentially exposed to a known infected dog, should be tested twice, 30 days apart, to establish negative status. The type of test used for dogs in kennels will be determined by the State Veterinarian.

Types of Test Available

Several test technologies are available. Each has its own set of positive and negative aspects. Owners should discuss options with his/her veterinarian.

- ME-RSAT (Slide Test/Card Test)
- Tube Agglutination Test
- ME-TAT
- AGID-TAT
- Indirect FA
- ELISA
- Blood Culture
- PCR

The ME-RSAT test can be done at a veterinarian's office; the confirmatory test must be performed at a laboratory. A veterinarian should recommend which confirmatory test will work best for an individual kennel.

***Brucella canis* Zoonotic Potential**

The National Association of State Public Health Veterinarians reported in 2012 that between 100 cases and 200 cases of brucellosis are reported in people each year in the United States. These cases include six classically recognized species based on antigenic/biochemical characteristics and primary host species: *B. abortus* (cattle), *B. melitensis* (sheep and goats), *B. suis* (swine, cattle, rodents, wild ungulates), *B. ovis* (sheep), *B. canis* (dogs), and *B. neotomae* (rodents). Recently, more species have been recognized.

In the majority of canine brucellosis (*Brucella canis*) cases in humans, the infection is related to exposure to whelping females when high concentrations occurred in birthing fluids and vaginal discharges. Because the organism is difficult to culture, study and diagnose, the epidemiology of infections in humans is poorly understood.

In 2012, a case of canine brucellosis in humans was diagnosed in a child in New York that was infected by a puppy purchased from a pet store. The source of the puppy was a large breeding operation in Iowa that was found to have several breeding dogs positive for the organism. Transmission was documented by laboratory tests that matched the strain of brucellosis in the child and puppy with the infection found in the kennel.

The incubation period in a human can vary. Reported times vary from 2 weeks to 3 months. No published information is readily available on the communicability of the organism to and between humans. No cases of transmission from human to human have been reported.

Clinical signs in humans are non-specific and may resemble influenza. Symptoms might include fever (often periodic and nocturnal), fatigue, headaches, weakness, malaise, chills, sweats and weight loss. Symptoms might include enlargement of the liver, spleen and lymph nodes. In severe cases, more serious symptoms such as septic arthritis and heart valve abnormalities may occur.

Diagnosis in people can be challenging. Culturing the organism is considered the “gold standard” for diagnosis, but is difficult and takes a minimum of 4 weeks. Serological tests can be tried, but, again, are difficult and can produce inconclusive results.

Prevention consists of testing any symptomatic and exposed dogs, then immediately removing test-positive dogs from the site. Good hygiene when around dogs, especially during whelping and abortions, is important. Contact with birthing fluids, vaginal discharges, and urine should be minimized, especially by anyone with a compromised immune system, children, pregnant women, and the elderly. Proper disposal of these bodily fluids and good cleaning and disinfection will help minimize any potential for infection.

Puppies born to infected dams are likely to be infected. Infected puppies will be infected throughout their lives, posing a health risk to people and to other dogs.

Indiana Rules Regarding Moving Diseased Animals

Knowingly moving animals infected with canine brucellosis, including selling or giving away, violates Indiana law and may be subject to action by the Board of Animal Health. Sites selling and/or receiving infected dogs may be subject to quarantine by BOAH.