Ontario Animal Health Network (OAHN)
Companion Animal Network
Factsheet

BRUCELLA CANIS

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Canine brucellosis

Canine brucellosis is caused by the gram-negative intracellular bacterium *Brucella canis*. It is commonly associated with reproductive failure and abortions in breeding kennel operations and should be considered whenever reproductive problems occur, whether acute or chronic. *Brucella canis* is a zoonotic organism, so care must be taken when handling potentially infectious material and when counseling kennel and pet owners regarding positive *B. canis* test results.

Dogs infected with *B. canis* are at high-risk of remaining lifelong carriers, even with treatment. It is therefore critical to remove carrier animals from breeding populations. Treatment, if pursued, requires surgical sterilization and long-term antimicrobial therapy, but even if initially successful, relapses are common. If treatment is attempted, owners must be made aware of the ongoing potential risk that an infected animal poses to humans and other dogs, and the need for regular serological testing to detect recurrence of infection. Veterinarians should discuss with their dog breeding clients the potential risks associated with sale of potentially infected puppies or adult dogs.

Clinical signs

Infection is often subclinical, but chronically infected dogs can still be a source of infection for other animals and humans.

Routine bloodwork and urinalysis are often normal in affected dogs.

In breeding females, infection causes conception failures and infertility, such as late-term abortion (45-55 days gestation) with prolonged vaginal discharge, stillbirths, decreased litter size, and decreased puppy survivability.

In breeding males, infection causes epididymitis, orchitis, testicular swelling or atrophy, sperm abnormalities and unwillingness to breed.

Generalized signs may be seen in dogs of any sex or age and include lethargy, weight loss, and lymphadenitis. Discospondylitis, uveitis, and meningoencephalitis may also occur.
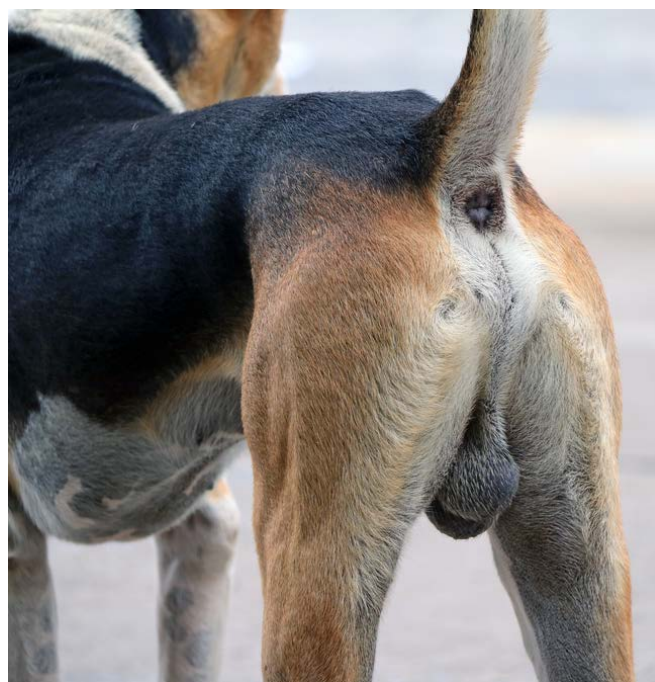
Transmission

Brucella canis is predominantly found in reproductive tissues and fluids, but can be isolated from a variety of sites in infected animals, including blood, milk, saliva, nasal and ocular secretions, and in the feces.

Both males and females may shed the organism in the urine for at least three months after becoming infected. The risk is likely highest in intact male dogs.

Infection in dogs occurs predominantly through ingestion, inhalation, or contact with aborted fetuses, placentas, vaginal secretions, or semen.

Shedding may persist for up to 6 weeks after an abortion and can occur intermittently throughout the life of an infected dog.

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Diagnosis

Serological testing

Serological testing is best performed at least
30 days following exposure.

- **RSAT**: Used as a very sensitive initial screening
  test, but has a high false-positive rate due to
  cross-reactivity with other antibodies

- **2ME-RSAT**: A more specific test used to confirm
  RSAT results

- **AGID**: Another very specific test that can be used to confirm RSAT and 2ME-RSAT results

Pathogen detection

- **PCR** and **bacterial culture** can be used to confirm the presence of *B. canis* in whole blood or
  vaginal/preputial swabs, but both tests have relatively poor sensitivity (high false-negative rate).
  Culture also requires special attention to sample handling, and additional laboratory precautions.

- Pathogen detection is also a challenge because of intermittent shedding in infected dogs.

Kennel testing

▸ Collect serum for antibody testing from all dogs with suspected exposure to *B. canis*. RSAT
  reactors should be confirmed using 2ME-RSAT or AGID. Dogs positive on both tests should be
  considered *presumptive positives*.

▸ In any group that includes presumptive positive cases, at least one additional test (AGID, PCR,
  culture) should be performed on one or more of these dogs to confirm the diagnosis.

▸ Dogs that are only positive on RSAT, or negative dogs in any group with a confirmed positive,
  should be re-tested in 3-4 weeks, as they may be in the early stage of infection based on
  exposure to other positive dogs in the group.

▸ Quarantine and test any new dogs entering the kennel, and retest breeding stock annually.

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Contact us!

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Precautions, cleaning, disinfection

Because of the zoonotic potential of *Brucella*, exercise caution when collecting and handling blood, serum, fluid or tissues from suspect cases.

Wear single-use examination gloves when assisting with whelping, breeding, handling of newborn puppies or fetal membranes, or when exposure to urine or vaginal secretions is likely.

Be especially careful when handling any aborted tissues or fetuses.

B. canis is readily inactivated by common disinfectants (e.g. quats, AHPs, bleach) as well as by sunlight.

B. canis is stable in the environment in organic debris for up to two months. High humidity and low temperatures also favour survival.

Cleaning procedures should include a degreaser/detergent to remove organic debris and any biofilms, followed by rinsing, drying and application of a disinfectant, being careful to follow the label instructions for concentration and contact time.

Additional resources

Worms & Germs Blog: Brucella. https://www.wormsandgermsblog.com/tags/brucella-canis/

Brucellosis in dogs and public health risk: Hensel ME at al. Emerg Infect Dis. 2018;24(8):1401-1406. https://dx.doi.org/10.3201/eid2408.171171

Best practices for *Brucella canis* prevention and control in dog breeding facilities: Bramlage DJ et al. USDA-APHIS, 2015. https://www.aphis.usda.gov/animal_welfare/downloads/brucella_canis_prevention.pdf

LabNote 61: Diagnostic testing for *B. canis*. Animal Health Laboratory, Guelph ON. https://www.uoguelph.ca/ahl/ahl-labnote-61-brucella-canis-resources-and-information-veterinarians