

Blastomycosis

Information for Dog Owners



Key Facts

Disease in dogs can be:

- Nonspecific - dogs may have fever, weight loss, or lack of appetite.
- Associated with signs in a specific organ/system, such as:
 - Respiratory disease, e.g. cough, difficulty breathing.
 - Eye disease, e.g. blindness, swelling within or around the eye.
 - Skin, e.g. ulcerations or mass-like lesions on the face, nose or nails.
 - Bone, e.g. lameness or swelling.

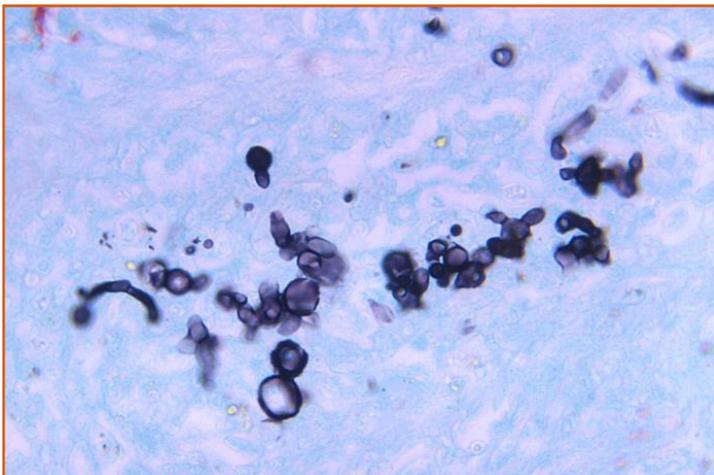
If appropriate treatment is started early, most dogs can be cured. However, long-term expensive treatment may be required.

Dogs living in or traveling to specific locations (see below) have the highest exposure to the disease-causing mold and are at greatest risk. Dogs involved in hunting or field trials in these areas are at increased risk of disease.

What is it?

Blastomycosis is due to infection with the fungus *Blastomyces dermatitidis*. The fungus is found in the environment, most often in sandy soil near bodies of water.

Disease in dogs can vary with infection site; lethargy, fever, cough and trouble breathing are most common.



Blastomyces dermatitidis fungus in canine liver tissue under microscopic examination (Public Domain: Centers for Disease Control and Prevention)



Where is it?

Due to the preferred environmental conditions of the fungus, blastomycosis is generally found in specific regions of North America. Although there is some risk of blastomycosis to dogs outside of these regions, it is very unusual to see dogs with blastomycosis who have not lived in (or traveled to) the following high-risk regions:

- USA: Ohio River Valley (i.e. Ohio, Indiana, Kentucky, southwest Pennsylvania, northwest West Virginia), Mississippi, Missouri and the Mid-Atlantic States.
- Canada: Manitoba, southern Saskatchewan, Quebec and Ontario.

Who gets it?

Dogs, humans, and rarely cats may experience clinical disease once infected.

Can people get sick with it?

Yes. Although human disease is uncommon, people need to be careful to avoid infection, particularly those who live in regions where the fungus is most common (see *Where is it?*).

People who have weakened immune systems may be more likely to develop severe blastomycosis than people who are otherwise healthy. Dogs may serve as sentinels for disease, as people can be infected due to exposure and contact with the same outdoor environment (e.g., soil) as dogs.

Very rarely, people have acquired blastomycosis after being bitten by, or being stuck by a needle used on a dog with blastomycosis.



How is it spread?

(Transmission & Infection risk)

The fungus has two distinct forms – a mold (present in the environment) and yeast (present in infected dogs/people). In dogs, infection typically occurs through inhalation of mold spores or when the mold contacts an open wound. Once within the dog, the mold form transforms into the yeast form and thickened inflammatory lesions containing pus can result. The fungus can also circulate in the dog's blood, moving to other organs or tissues (i.e. disseminated disease). The most commonly affected organs include the lungs, eyes, bone, skin and neurologic system (brain, spinal cord). An infected dog could transmit blastomycosis to another animal through a bite, although this appears to be extremely rare. Infected dogs do not typically serve as a source of infection for other dogs.



Infection risk appears to be highest for young (1-5 years of age), sexually intact, male, large breed dogs that live in (or travel to) endemic regions, particularly those located near a lake, river, or containing recently disturbed (e.g., dug up) ground or soil. Hunting and sporting dogs (e.g. hound and retriever breeds) are at higher risk of blastomycosis, likely due to their greater exposure to the mold through roaming, sniffing, and digging in the soil.

In North America, most cases of canine blastomycosis are diagnosed in late summer and early fall.

What should I look for? (Signs of disease)

Non-specific lethargy, fever, weight loss and lack of appetite are common. Signs of respiratory disease (e.g. cough, increased breathing effort, exercise intolerance), ocular (eye) disease (i.e. glaucoma, swelling, blindness), or skin ulcerations or mass-like lesions on the face, nose, and nails



can occur. Bone, spinal, and nervous system signs can also develop, such as lameness, neck pain, and seizures.

How is it diagnosed?

Your veterinarian will examine your dog for consistent disease signs. A history of your dog living in (or travel to) an endemic region (where blastomycosis is common) will increase their suspicion for blastomycosis and assist with diagnosis. Your veterinarian may discuss performing blood and urine testing, imaging (radiographs, ultrasound), and cytology or biopsy of a lesion or organ to find the fungus.

Specific fungal urine antigen testing can help confirm diagnosis and allow for therapeutic monitoring. However, other types of fungus can interfere with the test (e.g. provide a positive result), so providing your veterinarian with a detailed travel history for your dog can help in interpreting test results and ensuring that blastomycosis infected dogs receive appropriate treatment and duration. Similarly, blood antibody testing may also be used to help with diagnosis or when infection with the fungus cannot be confirmed through cytology or biopsy testing, i.e. samples do not reveal the fungus or cannot be safely obtained.

What is the treatment?

Will my dog recover?

Blastomycosis can be treated and most dogs have an excellent prognosis with therapy, especially if diagnosed and treatment is started early in the course of disease. However, long-term treatment (six or more months in many cases) is required and can be expensive.

Typically, therapy consists of appropriate antifungal medications, pain relief, and needed supportive care, such as intensive care monitoring and oxygen supplementation for dogs with difficulty breathing. Dogs with neurologic disease and severe lung disease have a more guarded prognosis. Ocular (eye) involvement will require aggressive care to try and save the eye, with the understanding that in some dogs, surgical removal of the eye (enucleation) may be advised to prevent the infection from spreading to other body locations.



Relapses are common, despite appropriate therapy.

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

Be informed and aware of endemic regions, along with reducing (as practical) exposure to lakes, rivers, and recently dug up soil. In high-risk areas, dogs should be kept away from construction or dig sites.

Owners of dogs involved in hunting or field trials in endemic areas should be especially aware of blastomycosis. Dogs should be kept away from specific locations where other dogs are believed to have become infected. Owners of infected dogs are encouraged to report such locations to local canine event coordinators or similar groups to allow for event location changes and other risk communication messaging as indicated.

Outbreak management:

It is uncommon for numerous dogs to be simultaneously diagnosed with blastomycosis in a single location. However, within high-risk regions, it is common for communities to observe multiple dog and human cases, sometimes within the same household. In such cases, it may be helpful to identify suspected sources of infection (e.g. nearby soil adjacent to bodies of water, construction or similar areas where soil is frequently disturbed) and for people and dogs to stay away from such areas.

Zoonotic (Human Infection) Alert:

Blastomycosis cannot be spread to people from dogs through the air, such as breathing or coughing. However, blood transmission (e.g. from dog bites, used needles) can occur. Similarly, care should be taken to regularly change any bandaged dog skin lesions and dispose of these used items safely, due to risk of inhalation of the fungus forming on bandages.

Given their increased susceptibility and exposure to the fungus, dogs can act as sentinels of human disease, so any increase in the number of canine disease cases should result in notification to local human public health organizations. Additionally, information on human cases (e.g. location, annual counts) can be useful in determining the risk for canine cases in the same area.



Additional Resources:

Taylor, S. and Gaunt, C. (2009). Canine blastomycosis: A review and update on diagnosis and treatment. DVM360. Available at: veterinarymedicine.dvm360.com/canine-blastomycosis-review-and-update-diagnosis-and-treatment

The Centers for Disease Control and Prevention. Fungal diseases: Blastomycosis. Available at: cdc.gov/fungal/diseases/blastomycosis/index.html

Werner, A. and Norton, F. (2011). Blastomycosis. Compendium. Available at: vetfolio.com/infectious-disease/blastomycosis

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