

# DISEASE CAUSED BY *BLASTOMYCES*, A TYPE OF FUNGUS (BLASTOMYCOSIS)

## BASICS

### OVERVIEW

- A generalized (systemic), fungal infection caused by the soil organism, *Blastomyces dermatitidis*

### SIGNALMENT/DESCRIPTION of ANIMAL

#### Species

- Dogs
- Occasionally cats

#### Breed Predislection

- Large-breed dogs weighing 55 lbs (25 kg) or more, especially sporting breeds; may reflect increased exposure rather than increased likelihood of developing disease

#### Mean Age and Range

- Dogs—most common 2 to 4 years of age; uncommon after 7 years of age
- Cats—young to middle-aged

#### Predominant Sex

- Dogs—males in most studies

### SIGNS/OBSERVED CHANGES in the ANIMAL

- Weight loss
- Decreased appetite
- Cough and difficulty breathing (known as “dyspnea”)
- Eye inflammation and discharge
- Lameness
- Draining skin lesions

#### Dogs

- Fever up to 104.0° F (40° C)—approximately 50% of patients
- Harsh, dry lung sounds associated with increased breathing effort—common
- Generalized or regional enlarged lymph nodes (known as “lymphadenopathy”), with or without skin lesions
- Inflammation of the iris (the colored part of the eye) and other areas in the front part of the eye (known as “uveitis”), with or without secondary increased pressure within the eye (known as “secondary glaucoma”) and inflammation of moist tissue of the eye (known as “conjunctivitis”), discharge from the eye, and fluid build-up in the clear part of the eye (known as “corneal edema”)
- Lameness—common because of fungal infection/inflammation of the bone marrow and bone (known as “osteomyelitis”)
- Enlargement of the testicles and prostate—occasionally seen

#### Cats

- Increased breathing effort
- Nodular (known as “granulomatous”) skin lesions

### CAUSES

- Inhaling fungal spores of *Blastomyces dermatitidis*

### RISK FACTORS

- Depend on environmental and soil conditions that favor growth of *Blastomyces*
- Wet environment—fosters growth of the fungus; banks of rivers, streams, and lakes or in swamps; most affected dogs live within 400 m of water
- Exposure to recently excavated areas
- Most common along the Mississippi, Ohio, and Tennessee River basins; also found in the area of the Great Lakes, the St. Lawrence River, and has been found in Colorado

## TREATMENT

### HEALTH CARE

- Usually outpatient with antifungal treatment, using itraconazole administered by mouth
- Dogs with severe difficulty breathing (dyspnea)—require an oxygen cage for a minimum of 1 week before lung improvement is sufficient for comfort in room air; many have worsening of their lung disease during the first few days of treatment, owing to an increase in the inflammatory response after the *Blastomyces* organisms die

## ACTIVITY

- Patients with breathing compromise must be restricted

## DIET

- Palatable and high-quality to stimulate the appetite

## SURGERY

- Removal of an abscessed lung lobe may be required when medical treatment cannot resolve the infection
- Blind eyes should be removed surgically (known as being “enucleated”) to eliminate potential sites of residual infection

## MEDICATIONS

Medications presented in this section are intended to provide general information about possible treatment. The treatment for a particular condition may evolve as medical advances are made; therefore, the medications should not be considered as all inclusive.

### ***Itraconazole (Antifungal Medication)***

- Dogs—as directed by your pet’s veterinarian; administer by mouth with a fat-rich meal, such as canned dog food, to increase absorption of the drug into the body
- Cats—open the 100-mg capsules containing pellets and mix the desired amount of pellets with palatable food, as directed by your pet’s veterinarian
- Treat for a minimum of 60 days or for 1 month after all signs of disease have disappeared
- Beware of generic itraconazole, as drug absorption is not reliable

### ***Other Medications***

- Dogs with nervous system signs should be treated with amphotericin B
- Ketoconazole—cheaper alternative to itraconazole; lower response rate and higher recurrence rate

## FOLLOW-UP CARE

### **PATIENT MONITORING**

- Blood work (serum chemistry)—monthly to monitor for liver toxicity or if lack of appetite (known as “anorexia”) develops
- Chest X-rays—determine duration of and response to treatment; considerable permanent changes in the lungs may occur after the infection has resolved, making determination of persistent active disease difficult

### **PREVENTIONS AND AVOIDANCE**

- Location of environmental growth of *Blastomyces* organisms unknown; thus difficult to avoid exposure; restricting exposure to lakes and streams could be done, but is not very practical
- Dogs that recover from the infection are probably immune to reinfection

### **POSSIBLE COMPLICATIONS**

- Blindness
- Death

### **EXPECTED COURSE AND PROGNOSIS**

- Death—25% of dogs die during the first week of treatment; early diagnosis improves chance of survival
- Severity of lung involvement and invasion into the brain affect prognosis
- Recurrence—about 20% of dogs; usually within 3 to 6 months after completion of treatment, even with 60 to 90 days of treatment; may occur up to 15 months after treatment; a second course of itraconazole treatment will cure most patients; drug resistance to itraconazole has not been observed
- With early detection of blastomycosis, the prognosis in cats appears similar to dogs

## KEY POINTS

- Treatment is costly and requires a minimum of 60 to 90 days
- Considerable permanent changes in the lungs may occur after the infection has resolved, making determination of persistent active disease difficult
- Not spread from animals to people, except through bite wounds; inoculation of *Blastomyces* organisms from dog bites has been reported
- Blastomycosis is acquired from an environmental source; people in the family may have been exposed at the same time as the pet; common source exposure has been documented in duck and coon hunters
- Family members with breathing problems and skin lesions should inform their physicians that they may have been exposed to *Blastomyces*