

# WOODVALE PARK

## VETERINARY HOSPITAL



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# Eosinophilic Pneumonia

(Inflammation of the Lungs with Eosinophils, a Type of White Blood Cell)

## Basics

### OVERVIEW

- Inflammation in the lung as a response to antigens (substances that induce sensitivity or immune response), characterized by accumulation of eosinophils (a type of white blood cell) and fluid into the lung, conducting airways (bronchi and bronchioles), and alveoli (the terminal portion of the airways, in which oxygen and carbon dioxide are exchanged)
- “Pneumonia” is inflammation of the lungs
- “Eosinophils” are a type of white blood cell; they are involved in allergic responses by the body and are active in fighting and damaging larvae of parasites in the body
- “Upper respiratory tract” (also known as the “upper airways”) includes the nose, nasal passages, throat (pharynx), and windpipe (trachea)
- “Lower respiratory tract” (also known as the “lower airways”) includes the bronchi, bronchioles, and alveoli (the terminal portion of the airways, in which oxygen and carbon dioxide are exchanged)

### SIGNALMENT/DESCRIPTION OF PET

#### Species

- Dogs

#### Breed Predispositions

- The Siberian husky may be more likely to develop eosinophilic pneumonia than other breeds

#### Mean Age and Range

- All ages, but more often seen in young adults (4–6 years of age)

### SIGNS/OBSERVED CHANGES IN THE PET

- Extremely variable, depending on the severity
- Harsh, moist cough—unresponsive to antibiotic therapy
- Labored breathing
- Rapid breathing (known as “tachypnea”) or breathing distress
- Exercise intolerance

- Lack of appetite (known as “anorexia”)
- Sluggishness (lethargy)
- Weight loss
- Nasal discharge (may be yellow-green or a combination of mucus and pus)
- Fever (uncommon)
- Abnormal breath sounds on listening to the lungs with a stethoscope (known as “auscultation”)—increased-intensity breath sounds; short, rough snapping sounds (known as “crackles”); and squeaking or whistling sounds (known as “wheezes”); decreased sounds can occur
- Enlarged lymph nodes (known as “peripheral lymphadenopathy”)—rare

## CAUSES

- Substances to which the dog has developed an allergy that are spread through the air (known as “aeroallergens”)—spores or threadlike filaments (known as “hyphae”) from fungi and actinomycetes; pollen; insect antigens; unidentified triggers of the immune response
- Parasitic antigens—heartworm microfilariae (the immature form of the heartworm, found in the blood of animals, especially dogs); respiratory parasites (parasites that reside in the respiratory tract or in the blood vessels of the lungs)

## RISK FACTORS

- Living in a heartworm-endemic area (that is, an area where heartworms commonly are found in dogs and, to a lesser extent, found in cats) without receiving heartworm preventive medication
- Dusty or moldy environment
- Air pollution

# Treatment

## HEALTH CARE

- Inpatient—recommended with signs involving multiple body systems (such as lack of appetite [anorexia], weight loss, and sluggishness [lethargy])
- Maintain normal hydration—important to aid the normal secretion clearance mechanism of the lungs; use a balanced electrolyte solution
- Oxygen therapy—for severe breathing difficulties (known as “respiratory distress”)

## ACTIVITY

- Restricted during treatment (inpatient or outpatient)

## DIET

- Ensure normal intake

## SURGERY

- May surgically remove lung lobes with large inflammatory nodules (known as “granulomas”)

# 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

- Steroids—prednisolone or prednisone, until clinical signs begin to resolve; then decrease dose slowly (over months), as directed by your pet's veterinarian
- Inhaled steroids, such as fluticasone, may be used following adequate control of disease and/or due to side effects of steroids administered by mouth—administer inhaled steroids with face mask and spacer
- Heartworm treatment—for heartworm-positive dog; initiate after the pet has been stabilized with steroids and rest
- Itraconazole or ketoconazole are drugs used to treat fungal infections; they are considered to be “antifungal drugs”—may be used with confirmed allergic response to fungal infection of the bronchi or lungs, which is a rare condition; use antifungal drugs only if the fungal infection is confirmed by microscopic evaluation of samples

from the lungs or fungal culture

- Hyposensitization—“allergy shots” based on results of skin or serum testing may be attempted to decrease the allergic response but are not the treatment of choice in most pets; most dogs still will require steroid therapy
- Other drugs that decrease the immune response (known as “immunosuppressive drugs”), such as cyclosporine—may use when steroids are contraindicated or have been ineffective
- Drugs to dilate the bronchi or bronchioles (known as “bronchodilators”)—may be helpful, particularly if squeaking or whistling sounds (wheezes) are heard when listening to the lungs with a stethoscope or labored breathing is observed

## Follow-Up Care

### PATIENT MONITORING

- Complete blood count (CBC) will show resolution of increased number of eosinophils in the circulating blood (known as “peripheral eosinophilia”) as the dog responds to treatment
- Arterial blood gases, to monitor levels of oxygen and carbon dioxide in the blood—most sensitive monitor of progress
- Listen to the pet's lungs (auscultate) thoroughly several times daily while hospitalized
- Chest x-rays (radiographs)—improve more slowly than the clinical signs

### PREVENTIONS AND AVOIDANCE

- Routine heartworm-prevention medication
- Change pet's environment, if a substance to which the dog has developed an allergy that is spread through the air (aeroallergen) is suspected

### POSSIBLE COMPLICATIONS

- Blood clots in the lungs (known as “pulmonary thromboembolism”)—dogs treated for adult heartworms (known as “dirofilariasis”)

### EXPECTED COURSE AND PROGNOSIS

- If primary allergen (substance to which the dog has developed an allergy) is identified and eliminated—prognosis good for mild cases
- If allergen (substance to which the dog has developed an allergy) is not identified—prognosis for control good; many pets require long-term treatment with steroids
- Heartworm infection—prognosis depends on severity of increased blood pressure in the lungs (known as “pulmonary hypertension”); enlargement of the right ventricle of the heart (known as “cor pulmonale”); and blood clots (thromboembolism)
- Condition characterized by multiple large, inflammatory nodules containing eosinophils (known as “eosinophilic granulomatosis”)—prognosis guarded; often disease is progressive
- High death rates are associated with severely low levels of oxygen in the blood (known as “hypoxemia”)

## Key Points

- Inflammation in the lung as a response to antigens (substances that induce sensitivity or immune response), characterized by accumulation of eosinophils (a type of white blood cell) and fluid into the lung, conducting airways (bronchi and bronchioles), and alveoli (the terminal portion of the airways, in which oxygen and carbon dioxide are exchanged)
- High death rates are associated with severely low levels of oxygen in the blood (hypoxemia)

# Notes

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