

PULMONARY HYPERTENSION

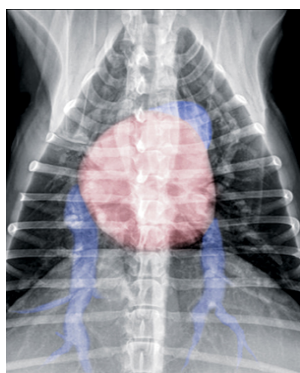
What is pulmonary hypertension?

Pulmonary hypertension (PH) is an increase in pressure within the pulmonary arteries (blood vessels connecting the heart and lungs) caused by constriction of the arteries. PH most commonly occurs due to primary respiratory diseases such as chronic bronchitis or pulmonary fibrosis, or secondary causes such as heart disease (severe mitral regurgitation), pulmonary thromboembolism (clot to the lungs) or heartworm disease. In some cases, the underlying cause is not known (idiopathic). Pulmonary hypertension is most common in smaller, middle-aged to older dogs, and is also more common at high altitude. Patients with mild to moderate disease can be asymptomatic. Signs of PH include increased respiratory rate or effort, coughing, exercise intolerance and collapse/loss of consciousness with exertion.

Tests

Physical Examination

Dogs with PH commonly (but not always) have a heart murmur on the right side of their chest due to a leak in their tricuspid valve (right sided heart valve). Dogs with severe PH have increased respiratory rate and effort and usually have abnormal lung sounds. Cyanosis (bluish color to the gums) can also be present. In some cases, right sided heart failure can occur, which results in a distended (fluid filled) abdomen.



Echocardiography (Heart Ultrasound)

Echocardiography is the best way to evaluate the heart structure and function, and least invasive method to diagnose pulmonary hypertension and estimate pulmonary artery pressure. Echocardiography allows the cardiologist to closely evaluate the heart chambers and valves and is also used to assess/quantify response to therapy.

Thoracic Radiographs (Chest X-rays)

Chest x-rays are often taken to evaluate for changes in the lungs that may indicate primary respiratory disease, and/or complications secondary to severe pulmonary hypertension.

Bloodwork

Full bloodwork and urine testing is recommended to assess for underlying diseases that predispose your pet to pulmonary thromboembolism (PTE) and other causes of pulmonary hypertension. This includes a Complete Blood Count (CBC), Serum Chemistry Panel, and Urinalysis and Heartworm testing.

At-Home Monitoring

Dogs with PH should be monitored at home for a cough, an increase in respiratory rate or effort, worsening exercise tolerance or collapse with exercise. If these signs are noted, follow up is recommended to determine whether medications need to be adjusted.

Medications

The following medications are commonly prescribed. The goals are treatment are to improve clinical signs and exercise tolerance. Many dogs respond very well to therapy and can have an excellent quality of life.

- (1) **Sildenafil (Viagra)**. Sildenafil is a phosphodiesterase-5 (PDE-5) inhibitor that dilates the pulmonary arteries which improves blood flow and oxygen delivery to/from the lungs.
- (2) **Clopidogrel (Plavix)**. Clopidogrel inhibits a receptor on platelets, preventing them from sticking together and forming clots. Dogs with pulmonary hypertension are at increased risk for pulmonary thromboembolism (PTE), and clopidogrel to help prevent clot formation.
- (3) **Oxygen Therapy**. Oxygen is a very potent dilator of the pulmonary arteries, and is used as an emergency treatment in hospital, as well as chronic treatment for dogs with pulmonary hypertension refractory to treatment. At home oxygen is usually well tolerated and can help improve quality of life for dogs that continue to have clinical signs despite medical management. A **Buster Cage** (made by Jorvet) may be purchased on Amazon.com for ~ \$250 and an **Oxygen Concentrator** may be rented (with prescription) from a local oxygen supply company.

Follow-Up

Once PH is well managed, routine follow up echocardiography to monitor the pulmonary artery pressure as well as overall heart function is generally recommended. This will enable your cardiologist to adjust/add medication in response to changes noted on examination, better determine prognosis, as well as fine tune treatment to your pet's needs.

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