



## Ryan Hospital

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## **Pulmonic Stenosis**

### **How does the heart work?**

The heart is responsible for maintaining the circulation of blood within the body. It is a four-chambered organ containing right and left atria (upper chambers) and ventricles (lower chambers). The right side pumps deoxygenated blood returning from the venous system in the body into the lungs. From the lungs, oxygenated blood enters the left side of the heart where it is pumped out into the tissues of the body through the arteries.

### **What is pulmonic stenosis?**

Pulmonic stenosis is the third most common canine congenital heart defect. Stenosis means narrowing and pulmonic stenosis (PS) refers to a narrowing of the opening of the pulmonary artery, often caused by an abnormal pulmonic valve. The pulmonic valve permits blood flow between the right ventricle and the pulmonary artery. Stenosis of the valve itself is by far the most common form of the disease; though, rarely stenosis above or below the valve can occur. This narrowing of the valve in most dogs is attributed to valvular dysplasia (abnormal development of the pulmonic valve). The narrowing causes higher than normal pressures in the right side of the heart which can ultimately lead to right ventricular hypertrophy (thickening of the heart muscle). These dogs are prone to developing ventricular arrhythmias (abnormal heart beats) that can result in sudden death. PS is most commonly seen in English bulldogs, terriers, Miniature schnauzers, American cocker spaniels, Samoyeds, Keeshonds, Mastiffs, and Beagles. A hereditary basis for PS has been proven in Beagles and is suspected in other breeds.

### **How is pulmonic stenosis detected?**

Pulmonic stenosis is often suspected based on a murmur during a routine physical examination of an otherwise healthy puppy. Generally these puppies appear bright, alert, and happy but they can show signs at home such as exercise intolerance, general fatigue, syncope (fainting), or ascites (fluid in the abdomen).

Definitive diagnosis is made using echocardiography or an ultrasound of the heart. Echocardiography also allows for assessment of the severity of the stenosis.

### **Are there surgical options for PS?**

Pulmonic stenosis is a defect that can generally be improved surgically. Surgery is usually recommended for dogs with severe pulmonic stenosis whether or not they are symptomatic at the time of diagnosis. Balloon valvuloplasty is a surgical procedure which is minimally invasive, meaning the chest does not need to be cut open. A balloon catheter is inserted into a vessel in the hind leg or neck. The balloon is positioned across the stenosis and inflated with fluid under pressure, which stretches or breaks the obstructing tissue and allows blood to flow across the stenosis more easily. The procedure has a good success rate and is relatively low risk. The most common complication is recurrence of the stenosis. In certain breeds, including English bulldogs and Boxers, the stenosis can be caused by an abnormal coronary artery wrapping around the pulmonary artery. In these cases, treatment options are more limited.

### **How is pulmonic stenosis managed?**

The prognosis for PS relates to the severity of the stenosis and the presence or absence of other cardiac disease. Dogs with mild stenosis usually have normal life spans and do not require therapy. Dogs with moderate stenosis usually have normal life spans, but may experience varying degrees of clinical signs requiring medical therapy. Congestive heart failure is a rare potential outcome to pulmonic stenosis. To learn more about the management of congestive heart failure, please refer to the CHF pamphlet.

If you have any other questions, please do not hesitate to contact us. Thank you for visiting the Cardiology Service at the Ryan Veterinary Hospital.