



# Patent Ductus Arteriosus (PDA)

## What is Patent Ductus Arteriosus (PDA) ?

Patent ductus arteriosus is a condition where the ductus arteriosus, a normal fetal structure that allows blood to bypass the puppy's lungs before birth, fails to close after birth.

In the fetus, the lungs are nonfunctional because the fetus receives oxygenated blood from the placenta. The ductus arteriosus is a temporary shunt that connects the pulmonary artery (which carries blood to the lungs) to the aorta (which carries blood to the rest of

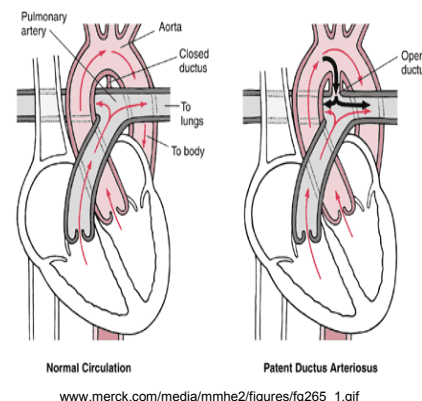


the body). This allows the blood to largely bypass the lungs and flow back to the placenta for re-oxygenation.

At birth, the puppy begins to breathe on its own and the blood flow through the ductus arteriosus decreases. In most dogs the ductus arteriosus will close in the first few days after birth. If this shunt does not close, it is termed patent (open) ductus arteriosus.

In the adult heart, the blood flows from the right side of the heart to the pulmonary arteries. The pulmonary arteries bring the de-oxygenated blood to the lungs for re-oxygenation. The oxygenated blood then flows from the lungs to the left side of the heart, and then to the body.

Patent ductus arteriosus is one of the most common congenital heart defects in dogs. Females are affected about twice as often as males. Chihuahuas, Collies, Maltese and other Poodles, Toy Pomeranians, and Shetland Sheepdogs are the breeds most commonly affected.



## How can we diagnose and treat dogs with PDA?

Most PDA's are found in young dogs. Often, the only sign of the heart defect is a continuous murmur detected on routine physical exam by a veterinarian. The murmur that is associated with PDA is usually loudest far forward on the left chest wall. Once a murmur is detected in an animal, further diagnostic tests are warranted to investigate the cause for the murmur. In PDA cases, an ECG (electrocardiography), thoracic radiographs, and echocardiography are warranted. Both the ECG and thoracic radiographs will likely show changes in the heart, vessels, and/or lungs that are consistent with a diagnosis of a PDA but cannot completely confirm it. The echocardiogram (ultrasound of the heart) will confirm the diagnosis of PDA by direct visualisation and will also help exclude other concurrent congenital heart defects (10% of dogs with PDA will also have additional heart defects).

The key to successful management and treatment of PDA is early diagnosis before the onset of clinical signs or secondary complications. The most common secondary complication is congestive heart failure. Symptoms of this would include difficulty breathing, exercise intolerance, and weakness/lethargy. Without proper diagnosis and treatment of a PDA early in life, congestive heart failure is likely to develop in weeks/years.

Thoracotomy and surgical ligation is a well-established method for PDA closure in dogs. Similarly, minimally invasive per-catheter procedures (keyhole surgery) have demonstrated a good success rate. Both surgical and per-catheter intervention to correct PDA in dogs are commonly available at specialist referral clinics.



*This handout provides a general overview on this topic and may not apply to all patients.*

*Please do not hesitate to contact us if you require any additional information ([www.cardiospecialist.co.uk](http://www.cardiospecialist.co.uk))*