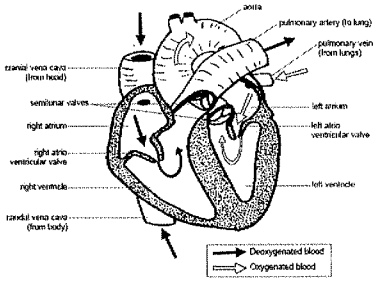
# Heart Disease in Bull Terriers

English Bull Terriers and Miniature Bull Terriers may be affected by **congenital heart disease** (birth defects of the heart) and also by **acquired heart disease** such as **valvular degeneration** and **dilated cardiomyopathy (DCM)**. Congenital heart disease is common in Bull Terriers and Miniature Bull Terriers, and in particular two diseases, **aortic stenosis** and **mitral dysplasia**. Sadly, congenital heart disease is often hereditary (passed down through the genes to future generations) which is why breeders are encouraged to join the heart screening programme, both to help identify the way that the defect genes are passed down, and also to reduce the severity and frequency of disease in these lovely dogs.

**Diagram of a normal heart:**

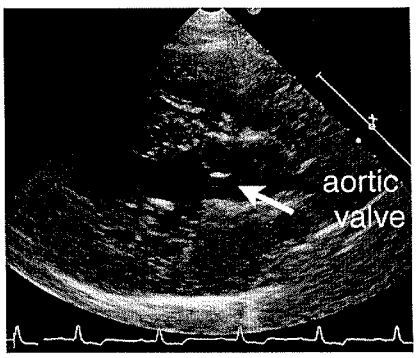



Echocardiograph images appear rotated clockwise through 90°

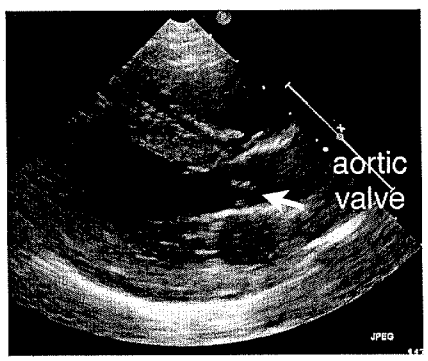
## Aortic stenosis

This is a narrowing or obstruction of the passage where blood leaves the heart and enters the main artery of the body, the aorta. In Bull terriers, the narrowing is often caused by the aortic valve leaflets being thickened or fused, but can also be due to a ridge of thickening immediately below the valve. The narrowing obstructs the flow of blood from the heart so that the heart has to work harder to push the blood around the body. The speed of blood in the first part of the aorta increases when the flow is obstructed because of pressure build up (like water from a hose pipe when a thumb is held over the end of the pipe). This creates the murmur that can be heard with the stethoscope, and this speed can be measured to give a indication of the severity of the obstruction.

The pictures below are from echocardiographic examinations of two miniature bull terriers, one normal, and one with severe aortic stenosis but no symptoms:




normal aortic valve

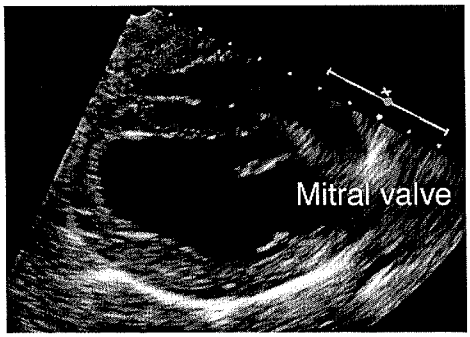



valvular aortic stenosis

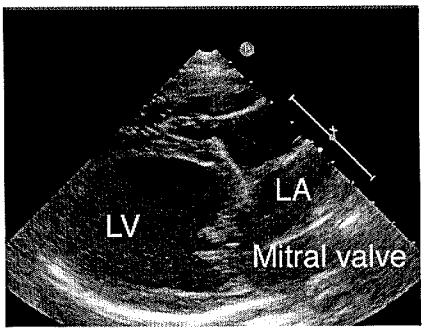
When aortic stenosis is severe it can cause exercise intolerance, fainting and occasionally sudden death as well as congestive heart failure if the mitral valve is also defective.

## Mitral dysplasia

This is a deformity of the valve (mitral valve) that divides the atrium (collecting chamber) on the left side of the heart from the ventricle (pumping chamber). The function of the valve is as a door which opens to allow the ventricle to fill, and to close when it is full to prevent back-flow. When deformity exists there may be failure of opening (stenosis) causing an obstruction to filling of the ventricle and/or a failure of closure, which allows leakage back into the atrium. Obstruction in this case also causes murmurs, by making the blood flow turbulent.




*normal open mitral valve*




*mitral valvular stenosis; valve is thickened and unable to open. The left ventricle (LV) and atrium (LA) are rounded and enlarged.*

If the deformity is severe as in the example above, blood is unable to empty adequately from the left atrium into the left ventricle. Pressure builds in the left atrium and eventually congestive heart failure develops.

## Heart Screening

Listening to a dog's heart with a **stethoscope (auscultation)** can enable the detection of a **heart murmur**. This is an abnormal sound caused by agitation or turbulence of blood by the presence of abnormalities such as those outlined above. Murmurs are graded subjectively from 0/VI to VI/VI with a grade 0 being no murmur at all, and a grade VI murmur being one that is so loud as to not require a stethoscope to hear it. Generally, the louder the murmur, the greater the likelihood of significant heart disease although there are exceptions. Grade I murmurs may be "innocent", i.e. caused by normal physiological conditions, but equally could be due to early or mild heart disease.

Auscultation is the first stage of the heart screening process, and for official certification for the breeding schemes, must be carried out by a veterinary cardiologist who is a member of the heart screening panel. A list of such cardiologists may be found on the Veterinary Cardiovascular Society's website.

**Doppler echocardiography** is the next stage of screening, and is advised where a murmur has been detected; particularly where the murmur is a grade II or above. This must also be carried out by a recognised cardiologist; there is a separate list of cardiologists permitted to perform this procedure for the breed scheme. Doppler echocardiography enables a definitive diagnosis to be made. The procedure uses sound waves to painlessly provide information about the structure and function of the heart. Bull Terriers rarely require shaving or sedation for the procedure, which is carried out with the dog lying, first on one side, and then the other, on a table. Many dogs find the process quite relaxing once they understand that nothing nasty is going to happen to them. Some cardiologists are happy for owners to be present at the procedure, and find that the dogs are reassured by this. Doppler echocardiography is a difficult skill requiring both dexterity and depth of knowledge. The machines used are equivalent to those used in Human cardiology and are therefore expensive to buy and to maintain which explains the cost of the examination. During the process the heart is examined subjectively to assess whether structures look normal, and also objectively by the accurate measuring of chamber sizes and structural movements, and use of complicated calculations to assess muscle function. Measurements such as left atrial size and the speed of blood in the aorta can be used to diagnose disease and also to give a prognosis; i.e. an indication of whether the dog is likely to develop heart disease and what symptoms to look out for. If there are signs of congenital disease, the use of the dog for breeding is advised against, as the genes for the disease may be passed down to further generations. Dogs with severe disease may be in the early stages of heart failure, and medication may be advised to improve quality of life and increase longevity.

Information obtained through the breeding schemes can be used in confidence to map the possible ways that diseases are passed through the generations, and also to analyse the effects of individual and combined heart disease in dogs. The scheme is therefore very important both for the improvement of the health of the breeds themselves, and also for the welfare of the unfortunate dogs who suffer from these diseases.

Sarah Smith MA VetMB DVC MRCVS
*RCVS Recognised Specialist in Veterinary Cardiology*