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Congenital Heart Disease

Stephen J. Ettinger, DVM, Diplomate ACVIM (Cardiology, Small Animal Internal Medicine)

What is congenital heart disease?

The presence of a congenital heart defect means your pet was born with an abnormality in the structure of his or her heart. The term congenital describes an abnormality that develops in the fetus and is usually recognized soon after birth. If the defect is severe, the embryo dies before birth. Most congenital defects are first recognized at or near the time of weaning when the pet is taken to the veterinarian for a first examination. Sometimes these problems may not be identified until later in life. Congenital defects are most often the result of abnormalities in the genetic makeup of the pet. The abnormal genes may or may not be present in other members of the litter but are carried by the mother and/or father, sometimes without compromising their health. Other causes of congenital defects include exposure to radiation, toxins, or physical events that occurred during the animal's embryonic stage. Pets with congenital or heritable heart defects should be spayed or neutered if possible and should not be used for breeding.

Numerous ways of classifying congenital heart defects exist, but for simplicity we will consider them in four major categories: (1) obstruction of blood flow within the heart; (2) abnormal communication between the two sides of the heart, increasing the blood flow from the left (systemic) to the right (lung) side of the heart; (3) abnormal communications sending blood in the opposite direction of flow, from the right (lung) to the left (systemic) side of the heart; and (4) vessel (vascular) abnormalities that obstruct a body part and interfere with normal function.

(1) Obstruction of blood flow within the heart includes conditions such as pulmonic, mitral, or aortic valvular stenosis. Valvular obstruction is caused by a narrowing of the area through which the blood flows. This narrowing decreases the circulation from the heart to some other part of the body. These conditions vary from mild to severe. Patients with the more severe variants may benefit from medication, opening the obstruction with a special balloon type catheter, or surgical correction. Surgery, although commonly performed in humans, is both difficult and infrequent in veterinary medicine.

(2) Blood may flow abnormally from the left to the right side of the heart because of failure of a normal fetal communication between the two sides of the heart to

spontaneous close at birth. One such congenital condition, patent ductus arteriosus (PDA), is the persistence of a blood vessel necessary in the womb that should normally close at birth when the lungs become functional. If a PDA is diagnosed early, it may be closed and the pet is typically able to lead a normal life. Other conditions such as ventricular or atrial septal defects (VSDs or ASDs) describe a hole between two chambers of the heart. The majority of pets with a small VSD or ASD as the only abnormality live normal lives. Closure of larger septal defects can sometimes be achieved using a catheter passed from peripheral blood vessel to deliver a "plug" for the hole (transvenous occlusion). A possible alternative closure would require open heart surgery and cardiopulmonary bypass which is infrequently performed in veterinary medicine.

(3) Defects that allow blood flow from the right to the left side of the heart without passing through the lungs are uncommon. These defects result in unoxygenated blood being transported to regions of the body which would normally only receive oxygenated blood. Such a situation usually does not allow the pet to live beyond early adulthood. Occasionally, medical management, transvenous procedures or surgical intervention may help prolong the pet's life.

(4) Persistent aortic arch, peripheral arteriovenous shunts, and cor triatriatum are heart problems that are the result of abnormal vessels interfering with normal blood flow. These conditions usually can be corrected surgically if identified early and before the development of secondary complications.

Because many congenital heart defects are thought to be due to genetic problems that can be passed from one generation to the next, veterinarians recommend that animals with such conditions be neutered at an early age to prevent breeding and the dissemination of defective genes to a new generation. Some congenital heart defects may be surgically corrected; others are effectively dealt with for variable periods using medication. Regrettably, some congenital heart defects have a poor long-term prognosis. In selected circumstances, euthanasia may be recommended if the pet is unable to maintain a good quality of life.

A number of more complicated congenital heart defects are not covered in this handout. If such a situation exists in your pet, your veterinarian will be able to discuss it with you and will probably refer you to a specialist with additional training and diagnostic equipment.

What are the signs of congenital heart disease?

A congenital heart defect is suspected after a thorough physical examination has been performed. Radiographs (x-rays) are needed to visualize abnormalities in the size and appearance of the heart, vessel, and lung structures. The ultrasound (echocardiogram) examination is a direct, noninvasive means of looking inside the heart's walls to measure the size of the heart's four chambers and to identify abnormalities (qualitatively and quantitatively) in blood flow. Occasionally, more invasive procedures such as cardiac catheterization (passing small tubes into the heart and blood vessels and injecting dye), MRI or CT scanning are also recommended.

Updated 6/8/2010: Fiona Campbell BVSc(Hons), PhD, MACVSc, DACVIM
(Cardiology)
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To learn more about animals living with congenital heart disease and what treatment they received, [click here](#) to meet "Bella", one of ACVIM's Animal Survivors.

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