



**Ettinger: Textbook of Veterinary Internal
Medicine, 7th Edition
Congenital Heart Disease
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What is congenital heart disease?

Your pet was born with a congenital heart defect. Congenital defects are abnormalities that occur in the developing fetus and are usually recognized soon after birth. If the defect is too severe, the embryo dies before birth. Other situations, not as severe, allow embryo development to birth, and the pet can live until the defect interferes with normal functioning (here, the cardiovascular system). 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.

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.

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 an area of blood flow, decreasing circulation from the heart to some part of the body. These conditions vary from mild to severe. They may be minimal and require no care. However, in other cases, medication only, opening the obstruction with a special catheter, or surgical correction may be needed. Surgery, although commonly performed in humans, is both difficult and infrequent in veterinary medicine.

Blood may flow abnormally from the left to the right side of the heart because of a hole between the two sides of the heart that did not close during embryonic formation. One such condition, patent ductus arteriosus (PDA), is a remnant of normal embryonic heart function. If PDA is diagnosed early, it may be corrected surgically and the pet may be able to lead a normal life. Other conditions such as ventricular or atrial septal defects involve a hole between two chambers of the heart. Closure of septal defects requires

open heart cardiopulmonary bypass surgery, which is infrequently performed in veterinary medicine.

Blood flow from the right to the left side of the heart without passing through the lungs is very abnormal and uncommon. Thus, a serious communication problem exists, which results in unoxygenated blood being transported to the body. Such a situation usually does not allow the pet to live beyond early adulthood. Because of the complicated nature of these problems, open-heart surgery is rarely an available option. Surgical procedures may be available at teaching and specialty clinics to treat such problems.

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, before complicating problems develop to preclude normal life.

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, most congenital heart defects have a poor long-term prognosis. It is sad for the owner and for the pet to suffer needlessly. 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. The electrocardiogram helps to identify the presence of abnormal heart chamber size as well as irregularities of the heart's rate and/or rhythm. 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) or surgical evaluation may be recommended.