



Animal Emergency & Referral Associates

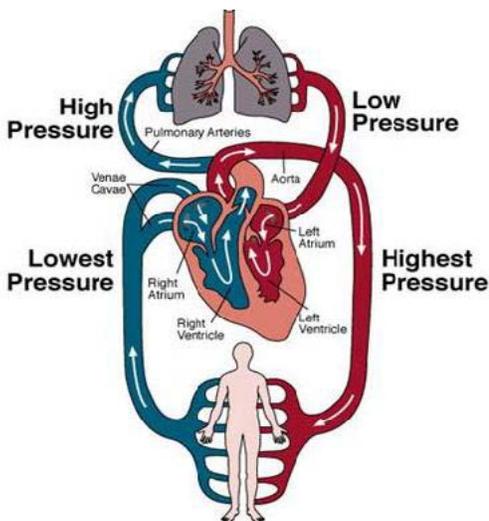
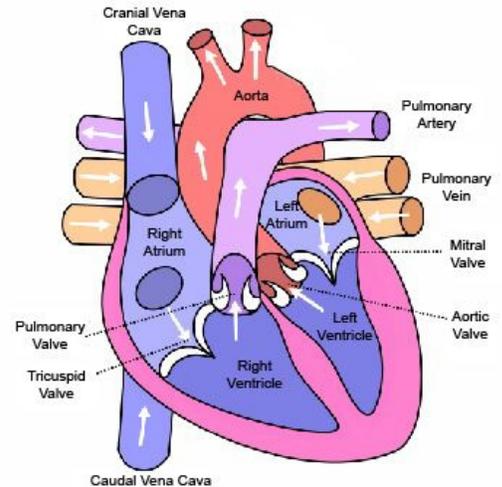
1237 Bloomfield Avenue • Fairfield, NJ 07004
973.226.3282 • Fax 973.364.0004 • animalerc.com

**Gordon D. Peddle, VMD,
DACVIM (Cardiology)**
Director of the Cardiology Section,
AERA Internal Medicine Department

Heart Disease and Congestive Heart Failure

Basic structure and function of the heart

The heart is a powerful organ responsible for circulation of blood and delivery of oxygen and important nutrients throughout the body. It consists of four chambers: the *right atrium*, *right ventricle*, *left atrium*, and *left ventricle*. The right-sided chambers provide blood flow to the lungs, while the left-sided chambers supply the remainder of the body. The right and left atria primarily serve as pooling chambers for blood returning from the body or lungs, respectively. The right and left ventricles are responsible for pumping of blood into the *pulmonary artery* and *aorta*, respectively. Specialized atrioventricular (AV) valves (*tricuspid valve* on the right, *mitral valve* on the left) separate the atria from the ventricles and prevent backwards flow of blood during cardiac pumping. Semilunar valves (*pulmonic valve* on the right, *aortic valve* on the left) separate the ventricles from the great arteries, preventing backwards flow of blood during cardiac filling. Heart disease in dogs and cats is usually caused by abnormal structure or function of heart valves or the heart muscle.



Circulation of the blood:

Blood low in oxygen content (*deoxygenated blood*) drains from the body into the right side of the heart and then is pumped into the lungs. Passage through the lungs increases the blood's oxygen concentration. This now *oxygenated blood* drains into the left side of the heart and is pumped to the rest of the body by the left ventricle. After oxygen and other nutrients have been delivered to the organs of the body, the blood, now low in oxygen content again, returns to the heart, and the cycle begins anew.

What causes a heart murmur?

A heart murmur is a specific sound heard with a stethoscope by a veterinarian. Heart murmurs are produced by turbulent, high-velocity flow of blood within or near the heart. While most heart murmurs signify the presence of underlying heart disease, there are some heart murmurs not associated with heart disease. These benign murmurs are common in puppies/kittens, adult cats, and some breeds of dogs. *Echocardiography*, or cardiac ultrasound, is the definitive method of identifying the cause of a heart murmur.

Congestive Heart Failure (CHF): When heart disease leads to circulatory congestion
Congestive heart failure (CHF) can occur secondary to progression of a variety of structural heart diseases in dogs and cats. It is a syndrome characterized by decreased cardiac output (blood flow) and circulatory congestion resulting in leakage of fluid from the circulation into surrounding tissues. The mechanisms that lead to CHF can be thought of as the body's normal responses to heart disease that have gone out of control. Left-sided heart failure occurs secondary to left heart disease and causes leakage of fluid into the lungs, known as *pulmonary edema*, in both dogs and cats. Cats with left-sided heart failure also may develop fluid within the chest cavity, or *pleural effusion*. Right-sided heart failure occurs secondary to disease of the right side of the heart and results in fluid leakage into the abdomen (*ascites*) and/or pleural effusion in both dogs and cats.

Common clinical signs associated with left-sided CHF in dogs and cats:

Dogs

- Elevated respiratory rate
- Respiratory distress
- Coughing
- Exercise intolerance
- Collapse/fainting
- Lethargy

Cats

- Elevated respiratory rate
- Respiratory distress
- Lethargy
- Hiding behavior
- Inappetance

Common clinical signs associated with right-sided CHF in dogs and cats:

- Abdominal distension
- Lethargy
- Inappetance
- Exercise intolerance
- Increased respiratory rate or effort
- Peripheral edema (less common)

How is congestive heart failure treated?

While in most cases the underlying heart disease is not correctable, the syndrome of congestive heart failure secondary to his/her disease can be medically managed to improve quality of life and prolong survival. The goal of therapy for CHF is to reduce circulatory congestion and decrease the workload of the heart. The mainstay of therapy for CHF is *diuretics*, which includes medications such as *Furosemide (Lasix)*. Diuretics increase the body's urine production to reduce circulatory volume overload that occurs with CHF. Ascites and pleural effusion may be periodically drained by a veterinarian. Other therapies commonly used include angiotensin-converting enzyme (ACE) inhibitors (eg Enalapril, Benazepril) and Pimobendan. In advanced CHF, your pet's cardiologist may institute additional medications to improve your pet's quality of life.

Prognosis for dogs and cats with congestive heart failure

The prognosis for pets with CHF is variable and dependent on the nature of the underlying heart disease as well as response to therapy. For specifics regarding prognosis associated with CHF and your pet's type of heart disease, please see our disease-specific brochures and consult with our cardiologist.