

Congestive Heart Failure

Diagnosis and Treatment



Timely diagnosis and treatment of congestive heart failure can give your Greyhound more time with loved ones. Annie, adopted by Tim and Jenny Wright from Rescued Racers of St. Louis, Mo.

Congestive heart failure (CHF) is a disease characterized by an enlargement of the heart, causing multiple clinical signs. Although CHF may be controlled with medication, the heart will eventually fail, leading to an acute death or requiring euthanasia. *Successful control of the disease requires an understanding of the circulatory system, the effect of medications on the circulatory system, the clinical signs of CHF, and its diagnosis and treatment.*

Normal Heart Function

The circulatory system consists of blood vessels to carry the blood, and a pump that circulates it. The heart is the pump. It receives blood from the entire body in the right side. The blood that enters the right side contains

mostly carbon dioxide and very little oxygen. The heart pumps this blood to the lungs, where the carbon dioxide is exchanged for oxygen; the blood then returns to the left side of the heart. The blood on the left side of the heart is then circulated to the body to provide oxygen and pick up carbon dioxide. Finally, the blood returns to the right side to start the trip all over again.

The blood vessels are the pipes that carry the blood. Arteries have small branches called arterioles that lead into even smaller capillaries, where oxygen exchange takes place. This path carries the blood from the left side. The capillaries then lead to venuoles and then veins that carry the blood from the right side back to the heart. The blood vessels do not just carry the blood. They are

dynamic structures that help regulate blood pressure, increase circulation to needed areas of the body (for example, to the intestines to absorb the nutrients from food), and assist in regulating sodium balance. These dynamic structures allow medical intervention to alleviate the clinical signs of CHF.

Diagnosing CHF

The clinical signs of CHF vary with the severity and acuteness of the disease. The Greyhound may present with just exercise intolerance. More severe signs include a progressive cough, dyspnea (shortness of breath), syncopal episodes (fainting), ascites (fluid in abdomen), and cyanosis (blue color to gums). The initial presentation varies with the length of time the heart has been failing,

any underlying medical conditions, and the side of the heart that is failing.

In right-sided heart failure, the Greyhound usually has a cough that increases in severity; he may also have ascites. In left-sided heart failure, the Greyhound usually has dyspnea and cyanosis. These signs, when present, help the veterinarian focus the examination.

When a Greyhound presents with symptoms of CHF, the veterinarian first performs a thorough physical exam. A history is taken, focusing especially on heartworm prevention, as this is the primary cause of CHF in young dogs. The veterinarian listens to the heart with a stethoscope, checks the gums for color, checks the pulses in the hind legs for pulse deficit (the veterinarian listens to the heart with a stethoscope while checking the pulse), and examines the jugular veins for pulses. In addition, the veterinarian palpates the abdomen for fluid. After the exam, testing is in order.

The initial testing should include a complete blood count (CBC), a chemistry profile, occult heartworm test, thoracic radiographs, and an electrocardiogram (EKG). The CBC and chemistry profile will help rule out any infectious causes and any underlying electrolyte imbalances (such as the sodium balance previously mentioned). The thoracic radiographs assist in assessing the size of the heart, which side is enlarged, and how much fluid may be collected in the lungs. Finally, the EKG measures the electrical activity of the heart, and also assesses the size of the heart. At larger or referral clinics, an echocardiogram is performed. This is an ultrasound of the heart to assess blood flow, heart enlargement, and valve function; it is also used as a tool to monitor ongoing therapy.

Treatment Options

Once a diagnosis is made, appropriate therapy is instituted. The medications are focused on alleviating the clinical signs and



Emmett, adopted by Amy Wanken of Columbus, Ohio.

returning the body's electrolyte balance. The classes of medications include diuretics, vasodilator therapy, and positive inotropes. The diuretics aid in the removal of fluid from the lungs; one side effect is increased urination. Diuretics also reduce the sodium surplus, allowing potassium to come back into balance. However, diuretics can also cause some deficiencies, so sodium and potassium should be monitored.

Vasodilator therapy causes the right-sided vessels and/or the left-sided vessels to expand in size. Various medications fall into this class, but the most popular are the angio-tensin-converting enzyme inhibitors (ACE inhibitors).

ACE is a hormone produced by the kidneys that constricts the blood vessels. As the heart fails, it is less able to maintain blood pressure. ACE allows the blood pressure to be maintained. However, as the vessels constrict, the heart must work harder to pump the blood. As the failing heart works harder, it begins to fail more quickly, and more ACE is produced. Left untreated, this continues in a vicious downward spiral. The ACE inhibitors stop this process by blocking ACE,

which allows the arterioles and venules to dilate, thus making it easier for the heart to pump the blood.

The final group of medications, that of positive inotropes, reduce the heart rate and aid in the contraction of the heart. The slower heart rate allows the heart to fill better before contracting. As a result, it is better able to move the blood.

After therapy is instituted, the patient is monitored for alleviation of clinical signs and for symptoms of any toxicity from the medications. A CBC and chemistry profile should be performed about every six months. This will monitor electrolyte levels, any infections that may occur, and any major organ abnormalities. Repeating the ultrasound helps monitor the patient's progress as the medications allow the heart to work more easily. Finally, follow-up thoracic radiographs monitor overall heart size.

CHF is a devastating disease that eventually leads to death. Medical intervention allows the Greyhound to live a comfortable life before the heart fails. ■