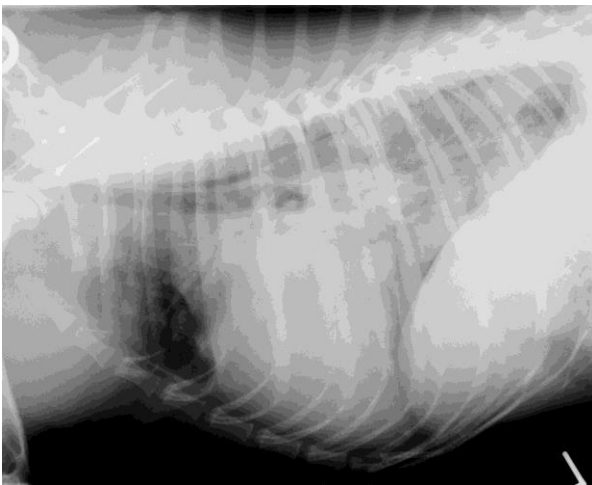




# EAST COAST VETERINARY CARDIOLOGY

## Congestive Heart Failure

Congestive heart failure (CHF) refers to the build-up of fluid within the lungs and body cavities as a result of heart disease. The heart works as a pump to move blood throughout the body, and when heart disease affects the ability to keep moving blood forward, fluid retention typically results. As most heart disease affects the left side of the heart, over time there is a build-up of pressure within the left sided chambers which subsequently increases the blood pressure within the blood vessels in the lung called pulmonary veins. This occurs as the pulmonary veins are the vessels which bring blood from the lungs into the left side of the heart. High pressure in these veins (called hydrostatic or water pressure) will lead to the leakage of fluid from the vessels into the airway spaces - this is called pulmonary edema. This fluid accumulation makes it difficult for animals to breathe. Thus, any heart disease which affects the left side of the heart may increase the risk for eventual left sided CHF.



When heart disease affects the right side of the heart (the side that collects blood from the body and pumps it to the lungs to become oxygenated), CHF will be associated with fluid retention in body cavities such as the thorax (pleural effusion), abdomen (ascites or peritoneal effusion) and the heart sac (pericardial effusion). Animals with right sided CHF are less likely to have peripheral fluid retention such as in the distal limbs.

The primary drug used to treat CHF is the careful use of a group of drugs called diuretics. These drugs cause the kidneys to excrete salt from the body which in turn causes water loss through the kidneys (into the urine). This fluid loss through the kidneys (through increased urination) will result in a reduction of the overall body water and blood volume. This lowers pressure in the vessels in the body (such as the lungs), thereby decreasing the formation of heart failure fluid (edema). A group of drugs called angiotensin converting enzyme (ACE) inhibitors are also prescribed which improve the body's ability to reduce salt and water retention, to reduce high blood pressure, and to limit the effect of hormones that negatively affect the heart. In some cases, additional diuretic will be used in combination (called multimodal therapy) to reduce the overall body water and blood volume. Medications may also be used to more aggressively lower blood pressure (vasodilators) which may help improve forward blood flow out of the heart.

Although these medications will help alleviate fluid accumulation and improve clinical, they can affect the kidneys and their function, and overzealous use can lead to dehydration and electrolyte (like salt) imbalances. This can cause lethargy, vomiting and loss of appetite. Therefore, it is important to monitor patients on diuretics and ACE inhibitors with blood tests to monitor kidney function and electrolytes. Blood tests are indicated anytime there is a change in diuretic dosing or when animal signs that suggest side effects of therapy are noted at home.

Pets diagnosed with CHF may ultimately be placed on multiple medications, and careful monitoring is required to minimize adverse effects. It is important that pets receive the medications as directed, and frequent follow-ups are required to ensure that the medications are controlling the CHF without causing side effects. If any changes are noted or concerns arise when treating your pet for CHF, please contact your family veterinarian or your veterinary cardiologist immediately.

Examples of some medications used when treating CHF in animals (most of these medications are human medications):

- Furosemide – this is called a loop diuretic. It is the first line diuretic therapy in an animal diagnosed with CHF. This medication has a wide dose range and is typically given two to three times daily. It will increase both thirst and urination.
- Benazepril/enalapril – these are called ACE inhibitors. They block hormones which can lead to fluid and salt retention in the body. They also lower the blood pressure slightly.
- Vetmedin (pimobendan) – this medication is called an inodilator meaning it improves the strength of contraction of the heart and dilates the arteries in the body to improve forward blood flow. Vetmedin is not indicated for all types of heart disease and there are contraindications in some cases. Your family veterinarian and veterinary cardiologist will discuss if this therapy is appropriate for your pet.
- Spironolactone – this is a type of diuretic known as a potassium sparing diuretic. It has a weaker effect than furosemide and should never be used as monotherapy for CHF. It helps to block a hormone called aldosterone which can lead to negative effects on the heart muscle. It is often added to furosemide as part of a multimodal diuretic protocol.
- Hydrochlorothiazide – this is a potent diuretic that is often added to furosemide. As it is more potent, careful trending of kidney values and electrolytes while receiving this medication is important.
- Torsemide – this is another loop diuretic which has about ten times the potency of furosemide. It may be used when patients have become refractory to furosemide therapy.

## Key Points

Congestive heart failure (CHF) refers to fluid accumulation within the body such as the lungs, thorax, abdomen.

Most animals with heart disease will have left sided CHF (fluid in the lungs) as left sided heart disease is more common.

Diuretics are one of the most important therapies for CHF. They cause fluid loss from the body (via increased urination). They can affect the kidneys and electrolytes so frequent bloodwork is essential in patients receiving these medications.

Multimodal diuretic therapy (multiple diuretics used in conjunction) may be helpful for some animals experiencing refractory CHF.

ACE inhibitors are commonly prescribed in patients with CHF – this class of drugs helps to block hormones that lead to fluid and salt retention and can help to lower the blood pressure.

It is important to monitor pets on CHF therapy for any signs suggestive of side effects of therapy – this may include sudden lethargy, poor appetite, vomiting, weakness. If noted, evaluation with a veterinarian on an urgent basis is recommended.

