**HEART (CARDIAC) FAILURE IN DOGS**

Heart failure is a syndrome that occurs when the heart is not able to properly fill with blood or properly empty blood from its chambers. It can result from practically any type of heart disease. There are four clinical stages of heart failure.

Stage A: patients at risk for heart failure (no overt or occult signs of heart disease)

*For example: dog breeds that are predisposed to developing heart disease – Doberman pinschers, Great Danes, Irish wolfhounds, Boxers, Cavalier King Charles spaniels, dachshunds, etc.*

Stage B: patients that have structural heart disease but have not developed heart failure (enlargement of the heart may or may not be present)

Stage C: patients that have or previously have had clinical signs of heart failure

(these patients may have been placed on medications, which are usually continued for the remainder of the pet’s life)

Stage D: patients with refractory heart failure (these patients are not responding to medications)

**Acute Heart Failure**

Acute congestive heart failure is characterized by the sudden onset of clinical signs associated with pulmonary edema (fluid accumulation in the lungs), pleural effusion (fluid accumulation in the space around the lungs) and/or abdominal effusion (fluid accumulation in the abdomen). Acute heart failure is a common cause of respiratory distress that is often associated with worsening cardiac performance in patients with chronic heart disease.

History/Clinical Signs: increased respiratory rate and/or effort (may seem like shortness of breath), coughing (in dogs, rarely seen in cats), and/or restlessness. The pet may also be unwilling to lie down and seem uncomfortable.

Diagnosis: a diagnosis is usually made using a combination of physical examination and radiographs (x-rays) of the chest +/- the abdomen. A blood profile will most likely be recommended to check the patient’s overall health. An echocardiogram (ultrasound of the heart) may be recommended for diagnosis of the specific heart abnormality causing the failure. An EKG may also be recommended if an irregular heart beat is present.

Treatment: the goal of treatment is to restore respiratory function by eliminating the excess fluid and in some cases, improving the performance of the heart. Initial treatment may involve hospitalization, sedation (to reduce anxiety and calm the patient), a diuretic, oxygen therapy, and/or removal of fluid. Once the short-term disaster is resolved, we look to a more long-term therapy plan (see below).

**Chronic Heart Failure**

Chronic heart failure is present when acute heart failure is treated successfully, but the underlying cause cannot be cured (which is usually the case). Sometimes patients present with low grade failure and there has not been an acute crisis. Clinical features of chronic heart failure include a history of acute heart failure with partial or complete resolution of signs with treatment but persistence of the underlying cardiac lesion.

History/Clinical Signs: clinical signs such as respiratory distress generally have improved or resolved with initial treatment. Signs such as abdominal distension, collapse, lethargy, decreased appetite, and weight loss may persist. Patients with chronic heart failure can have rebounding episodes of acute heart failure.

Diagnosis: a diagnosis of heart failure has usually already been made at this time. However, x-rays and/or an ultrasound of the heart may need to be repeated. Recheck bloodwork will be necessary to monitor certain values, especially when certain medications are used.

Treatment: managing the failing heart is all about creating a balance for what the sick heart can handle and lifting the burden created by the protective mechanisms in the body. Patients should be comfortable and be able to perform modest exercise. There should be minimal discomfort due to coughing, fluid build-up, and/or collapse. Listed below are specific medications used in the treatment of heart failure.

* **Diuretic (ex. Furosemide/Lasix) –** this medication is used to remove fluid from the lung tissue or chest/abdominal cavity. It causes excretion of sodium by the kidneys. This in turn causes water to be excreted (or increased urine production). If a patient is on a high sodium diet, more diuretics are necessary to combat the sodium/water retention (fluid build up). *Side effects include:* *increased thirst and increased urination*. This medication can cause changes in the kidneys and potassium level so periodic bloodwork is recommended.
* **ACE Inhibitor (ex. Enalapril/Benazapril) –** in order to understand this medication we have to understand the patients hormonal mechanism. In heart failure there is often a drop in blood pressure which causes the kidneys to release a hormone called renin. This hormone undergoes a reaction which eventually leads to blood vessel constriction that in the long run can weaken the heart further. This medication stops the reaction which in turn keeps blood vessels more dilated, causing blood pressure to normalize and lessen the work on the heart. *Side effects include: nausea, decreased appetite, and/or diarrhea. Rarely this medication can cause lethargy/listlessness.* This medication can also cause changes in the kidneys so periodic bloodwork is recommended.
* **Pimobendan (Vetmedin) –** this medication is used in dogs with stage C or D heart failure (related to dilated cardiomyopathy or valve disease). It is used to help the heart pump more efficiently. *Side effects are rare and include vomiting/gastrointestinal symptoms.* There are studies that show this medication can increase quality of life and increase a patient’s lifespan.
* **β-Blocker (ex. Atenolol/Propanolol/Sotalol) –** in certain types of heart disease beta blockers may be used to relax stiffened heart muscle and slow the heart rate. This allows for more efficient filling of the heart. *Side effects can include: decreased blood pressure (lethargy/listlessness) and diarrhea (or gastrointestinal upset).* These medications may also be used to treat high blood pressure and certain heart arrhythmias.
* **Spironolactone –** this medication acts as a diuretic in order to remove excess fluid from the lungs and/or chest/abdominal cavity. It may be used in combination with another diuretic. *Side effects can include: dehydration, gastrointestinal distress (vomiting, anorexia, etc.), and CNS effects (lethargy, ataxia, etc.)*. Because this medication can cause electrolyte changes and/or changes in your pet’s kidneys periodic bloodwork is recommended.
* **Digoxin –** this medication is used for certain type of heart disease, and has many actions. It works to increase heart contractility, increase diuresis, decrease heart size, decrease heart rate, etc. *Side effects are usually seen with high/toxic blood levels and include heart arrhythmias and/or worsening of heart failure signs. Other general side effects include mild gastrointestinal upset (anorexia, diarrhea, weight loss).* Because toxic levels of this drug can be administered, bloodwork to check digoxin levels will be recommended.
* **Nutrition/Diet –** a sodium-restricted diet can help relieve some of the heart’s burden and workload. Over the counter diets are available (however, many dogs find them unappealing) or a prescription diet may be recommended. Many types of dog food, treats, and table food (cheese, lunchmeat, peanut butter) are laced with sodium. *Safe treats for dogs include: apple slices, baby carrots, banana slices, orange pieces, and/or peanut butter labeled “no salt added”.* Commercial treats should contain less than 13mg of sodium per treat. Limit intake to only a couple of treats per day. Other important diet aspects include: adequate protein/energy content and high palatability (pet acceptance).
* **Activity Restriction** – avoid exercise that leads to excessive panting or weakness; however, some exercise is good for the pet’s well-being and life quality.

**TAKE HOME POINTS**

* A sodium-restricted diet can improve the control of heart disease and decrease medication dosages.
* Once medications are started, they are continued throughout a pet’s life, unless specifically stopped by your veterinarian. Dosing changes may be made based on your pet’s progress.
* Management of chronic heart failure requires careful monitoring including periodic bloodwork.
* The best thing to monitor at home is your pet’s activity level and resting respiratory rate. If at any time you notice your pet is coughing, more lethargic, breathing more frequently, or breathing heavier please contact us.

If you have any questions throughout your pet’s treatment please do not hesitate to call us - (815) 469-9300.