

## HEART FAILURE MANAGEMENT

(Adapted from Veterinary Information Network [www.vin.com](http://www.vin.com))

Managing the failing heart is all about creating a balance for what a sick heart can handle and lifting the burden created by the protective mechanisms of the crisis. Our patient should be comfortable and able to perform modest exercise. We want to minimize discomfort due to coughing, fluid build-up, or collapse.

Heart failure can be staged according to the severity of the signs and therapy can be selected from the options reviewed below based on the patient's stage.

### Clinical stages of Heart Failure

**STAGE I** > The patient has heart disease but there are no clinical signs of any kind.

**STAGE II** > The patient has heart disease and clinical signs of heart failure occur with exercise but not at rest.

**STAGE III** > Heart disease is producing clinical signs of failure with day to day activity.

**STAGE IV** > Severe signs of failure are present even at rest.

Patients in Stage IV require emergency care while those in earlier stages have the leeway of oral medication trials at home. Not every patient will respond to therapy and it may take weeks to achieve the desired balance.

### Sodium Restriction

In most heart failure scenarios, the heart is unable to handle the blood volume with which it is presented. Fluid backs up and leaks out, creating either fluid in the lung (pulmonary edema) or fluid buildup in the belly. In the long term, the last thing we want is to retain sodium and give the heart more blood volume to pump.

A sodium-restricted diet is helpful in relieving some of the heart's burden if the pet will eat it. Some commercial diets are available but are generally bland. Using purified water for drinking may also help as many geographic areas contain water with high sodium levels.

Poor appetite bodes poorly in heart failure as does loss of muscle tone. One must balance the blandness of the low sodium diet with keeping the pet's appetite up.

### Omega 3 Fatty Acids

Supplementation with omega 3 fatty acids is currently being researched as a possible treatment for the drastic weight loss (cardiac cachexia) that occurs with some cases of heart failure. If a pet enjoys these fishy flavored supplements, this may be a particularly helpful way to encourage appetite.

### Activity Restriction

People often ask how much restriction in exercise they should impose. Some exercise is good for the pet's well-being and life quality. Avoid exercise that leads to excessive panting or weakness.

### Diuretics

A diuretic is a drug that increases urine production. Diuretics are life-saving in a heart failure crisis where the lungs are filling with fluid because the heart cannot pump blood in quantities large enough to prevent fluid build-up. The dose needed for long term comfort is highly individual and may change depending on the stage of disease. Furosemide is almost always the first diuretic used as it is one of the most powerful. It is often used in combination with an ACE inhibitor or with the newer drug, pimobendan (which strengthens heart contractions), for long-term therapy. Spironolactone is another diuretic commonly used especially in patients who do not respond adequately to furosemide alone.

When an animal is placed on diuretics, the vet will likely monitor blood kidney parameters and reduce the dose to as low as possible to avoid renal side effects.

### ACE Inhibitors

ACE stands for angiotensin converting enzyme. Angiotensinogen is an inactive product made by the liver. It circulates all the time and converts to a substance called angiotensin I at a rate so slow as to be completely innocuous. When blood pressure drops, receptors in the kidney detect the drop and release a hormone called renin. Renin is a catalyst. It makes the conversion of angiotensinogen to angiotensin I happen much faster to create a large amount of circulating Angiotensin I. The final activation occurs in the lung where ACE converts angiotensin I to angiotensin II.

By using medication to inhibit ACE, we get less sodium retention and we keep blood vessels open. When the heart is overwhelmed by the amount of blood it is asked to pump forward (i.e. it receives more blood than it can pump out), it is helpful to dilate peripheral blood vessels. Another analogy might involve a freeway system or turnpike with an inefficient tollbooth: Opening up more side streets, reduces traffic on the main freeway. Opening up peripheral blood vessels means less blood volume for the overloaded heart to pump.

One of the effects of the ACE inhibitor is reduced blood flow through the kidney. The kidney's normal function depends on receiving good blood flow. Borderline kidney function may suffer from ACE inhibitor use, particularly when it is combined with diuretics - as it usually is for heart failure - thus necessitating monitoring tests for kidney function. ACE inhibitors can also drop blood pressure excessively and may lead to retention of potassium.

### Pimobendan

Pimobendan is a relative newcomer to the cardiac drug world. It works by helping the heart pump more efficiently and strongly. It also dilates blood vessels both going to and from the heart thus giving the "extra" blood a place to go so as not to overload the heart. Relatively stable heart failure patients are commonly started on this medication in addition to a diuretic and sometimes also with an ACE inhibitor.

***It is important to realize that heart failure is a symptom of a structural heart disease. Beyond simply managing heart failure, it is important to determine why the heart failed in the first place and identify the disease process that is responsible. More specific therapy may be helpful.***



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### Respiration rate

A patient with heart failure distress will have an increased respiratory rate. A pet with controlled heart failure may have a respiratory rate that is greater than normal. It is helpful to know what is normal for your pet and check several times daily. Simply watch the number of chest excursions during a 15-second period. A change in respiratory rate is a good sign the pet needs a check up with the veterinarian. With cats, be sure the cat is not purring when respiratory rate is checked. Do not count panting for dogs.