

# Heart Conditions

in dogs & cats





## Heart problems

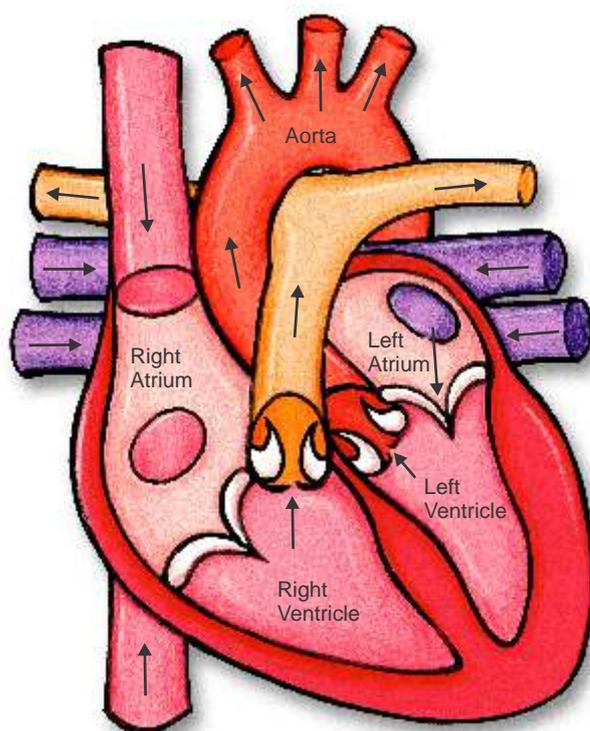
Heart disease is a serious problem that affects a large number of dogs and cats.

The heart is a muscular organ consisting of four chambers, two of which are located on the left side of the heart, and two on the right side. Each side of the heart also has a set of valves. When heart disease is present, certain parts of the heart cease to function properly.

Heart problems in dogs and cats can be very serious and life threatening and often present without our awareness or prior warning. They can vary from congenital or hereditary problems that they are born with, to problems of old age such as congestive heart failure in dogs or secondary to other conditions such as hyperthyroidism (overactive thyroid) in cats.

**The following pages will explain two common heart conditions -**

- Cardiomyopathy
- Valvular Insufficiency and Congestive Heart Failure





## Cardiomyopathy

### **What is Cardiomyopathy?**

Cardiomyopathy is the name applied to an abnormality of heart muscle function. The heart's pumping ability is reduced, resulting in signs such as;

- Inability to exercise
- Fatigue
- Fainting
- Fluid collection in the lungs, abdomen and limbs
- Emboli (clots that arise in the heart and travel to the kidney, brain, or legs)

Although some patients with cardiomyopathy do not develop clinical signs, others experience rapid progression of their disease or sudden death.

### **What are the causes?**

The causes of cardiomyopathy include;

- Genetic predisposition
- Infections
- Toxic causes (drugs and chemical compounds)
- Specific dietary insufficiencies
- Unknown causes

While some cases are entirely reversible, others are not and are treated with various levels of success.



### **Are there different types of cardiomyopathies?**

Yes, there are three major forms of cardiomyopathies which occur in the dog and cat species.

#### **Dilated cardiomyopathy**

In dilated cardiomyopathy, the heart muscle is weak and flaccid (floppy). This condition is associated with a reduction in heart muscle function during contraction (systole) and a decrease in forward flow of blood.

Subsequent upper heart chamber (left atrial) enlargement is associated with backup of blood and then fluid into the lungs (pulmonary edema) and so a cough often occurs.

#### **Hypertrophic cardiomyopathy**

Hypertrophic cardiomyopathy is a thickening of the lower heart muscle chambers (ventricles). The results are inappropriate heart function, obstruction of blood flow from the heart into the circulation, and enlargement of the upper heart chambers (atria). This abnormality is called diastolic dysfunction, a condition in

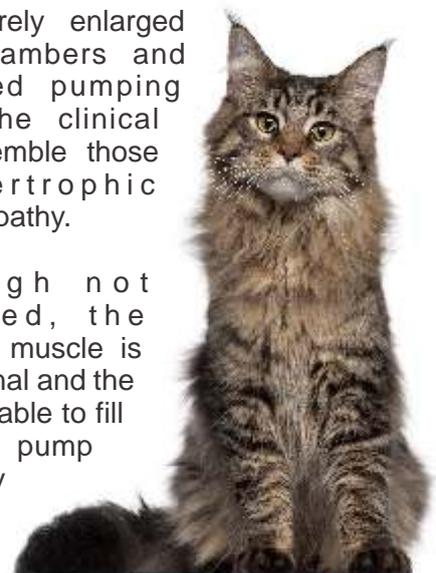
which the heart fails to relax fully, fill, and then empty.

The resulting backup of pressures into the lung is responsible for the clinical signs of respiratory distress, coughing, and systemic emboli (blood clots).

#### **Unclassified or restrictive cardiomyopathies**

Unclassified or restrictive cardiomyopathies are unidentified disease conditions in which heart problems are associated with severely enlarged upper chambers and diminished pumping ability. The clinical signs resemble those of hypertrophic cardiomyopathy.

Although not thickened, the ventricular muscle is dysfunctional and the heart is unable to fill and then pump adequately



## What are the signs of cardiomyopathy?

Cardiomyopathies are seen in both dogs and cats. The form in dogs is usually dilated, whereas hypertrophic and unclassified forms are identified most often in cats.

The diagnosis of cardiomyopathy is based on

- A history of weakness
- Coughing
- Panting
- Fainting
- Fluid collection around the lungs and in the abdominal cavity
- Weight loss
- Seizures associated with fainting may occur
- Emboli (clots) can result in blood vessel blockage, sudden lameness, and cold painful limbs.

## What are the clinical signs?

Clinical signs usually develop suddenly, often without apparent prior illness. In addition to these signs, the diagnosis depends on abnormalities found at;

### Physical examination

- Irregularities occur in the heart's

rhythm and rate

- Abnormal heart sounds (murmurs) are heard with the stethoscope

### Radiograph (x-rays)

- X-rays of the chest show heart enlargement

### Blood work

- Evaluation of the blood may identify complicating organ problems

### Electrocardiogram (ECG)

- The electrocardiogram can diagnose an irregular heart rhythm and substantiate heart enlargement

### Ultrasound

Ultrasound examination of the heart confirms the suspicion of cardiomyopathy. We see;

- Dilatation of the heart cavity
- Poor contractility of the heart muscle
- Left atrial enlargement (with dilated cardiomyopathy).
- Thickening of the heart muscle
- Obstruction of the flow of blood into the circulation
- Left atrial enlargement (identify hypertrophic cardiomyopathy).
- Normal muscle thickness with disturbed function and enlarged left atria (indicates restrictive cardiomyopathy).

These images show an enlarged heart, fluid accumulation on the lungs and the trachea is pushed upwards due to the large heart.



### **What treatment is needed?**

Treatment varies with the type of cardiomyopathy.

#### **Dilated cardiomyopathies**

- Indicative of a loss of contractile heart strength, requires medications to improve strength (digitalis)
- To remove excess fluid accumulation (diuretics)
- To counteract abnormal hormone levels that contribute to heart failure (angiotensin-converting enzyme inhibitors)
- A low-salt diet is important to reduce sodium levels and subsequent water retention
- Nutrients such as taurine and carnitine may be required to counteract specific deficiencies
- Manual removal of excess fluid accumulation is sometimes necessary

#### **Treatment of hypertrophic and unclassified cardiomyopathies**

- Drugs to allow the ventricular muscle to relax may be used. This improves heart filling and blood flow to the body. Beta-adrenergic blocking agents or calcium-channel blocking agents often are used for this purpose.
- Removal of excess fluids from the body (diuretics)
- Sometimes manual removal of fluid from the chest space is necessary to improve comfort.
- Low-salt diets to counteract salt and water retention are indicated but may be difficult to achieve with a finicky and ill cat.
- Aspirin is used to reduce the likelihood of blood clot formation within the heart.
- Antiarrhythmic agents to control irregularities of the heart's rate and rhythm are called upon at times,
- Nutritional supplements (taurine and/or carnitine) in known deficiencies.

### **What is the prognosis?**

The prognosis for survival with cardiomyopathies varies from poor to good. Once cardiomyopathy has been recognized, much of the damage to the heart muscle has already occurred.

The result is congestive heart failure, the signs and symptoms of which may be treated for a variable period of time (often 3 to 12 months, which is equivalent to 3 to 5 years in a human). Although the pet may enjoy a period of good health and comfort, the long-term prognosis continues to indicate that heart failure will recur. As a result, the pet will become less responsive to medical intervention. Surgery is not yet an option for any form of cardiomyopathy.





## Valvular Insufficiency and Congestive Heart Failure

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### What is valvular insufficiency?

Valvular insufficiency occurs when damaged and thickened heart valves develop. This affects small and midsize dogs. Valve problems are unusual in larger-breed dogs and in cats but they may develop.

In the small breeds of dogs, valvular insufficiency begins in midlife and progresses slowly. The disease is associated with thickening and shortening of the valve components that separate the upper (atria) from the lower (ventricles) parts of the heart.

*Remember, normally blood flows in only one direction. If the valves fail to close completely when the heart contracts, blood moves forward but some leaks backward.*

### What are the clinical signs?

Clinical signs vary depending on whether the right and/or left side of the heart is

affected and whether heart enlargement presses on the windpipe. Fluid accumulates when the heart fails to pump enough blood to the body and instead the blood is transmitted backward from the heart to the lung or body.

Owners of pets with valve problems see;

- Inappropriate panting
- Heavy breathing
- Diminished exercise ability
- Fatigue
- Cough
- Occasional fainting

The cough usually starts at night and progresses to daytime as well, particularly when associated with exercise. Retching and non-productive gagging follow the cough. When the left side of heart is affected, fluid may accumulate around the lungs, making it difficult to breathe. If the right side is affected, fluid accumulates in the abdomen, making it swell.

## What tests are needed?

- **Physical examination**

Abnormal heart sounds can be heard with a stethoscope

- **Electrocardiogram (ECG)**

An electrocardiogram (ECG) to identify heart enlargement or irregularities of the heart's rhythm.

- **Radiographs (x-rays)**

X-rays can demonstrate heart enlargement and/or inappropriate fluid accumulation.

- **Blood Test**

Blood testing can identify hormonal, kidney, or other internal medical problem.

- **Ultrasound**

An ultrasound examination (echocardiography) accurately pictures enlarged heart chambers, abnormalities of valve structure, and the heart's pumping ability.

*These tests assess heart function and severity of the disease and identify the need for therapy.*

## What is the treatment?

A number of treatments are used for pets with valvular heart disease. They include;

- **Exercise restriction.**

Walking is a good exercise.

- **Digitalis**

A medication used to strengthen the heart and to treat some irregularities of its rhythm. It maintains a slower and more effective heart muscle contraction.

- **Diuretic agents**

Commonly given to remove excess water accumulation from the body and can cause increased water drinking and urination.

- **Angiotensin-converting enzyme inhibitors (ACEIs)**

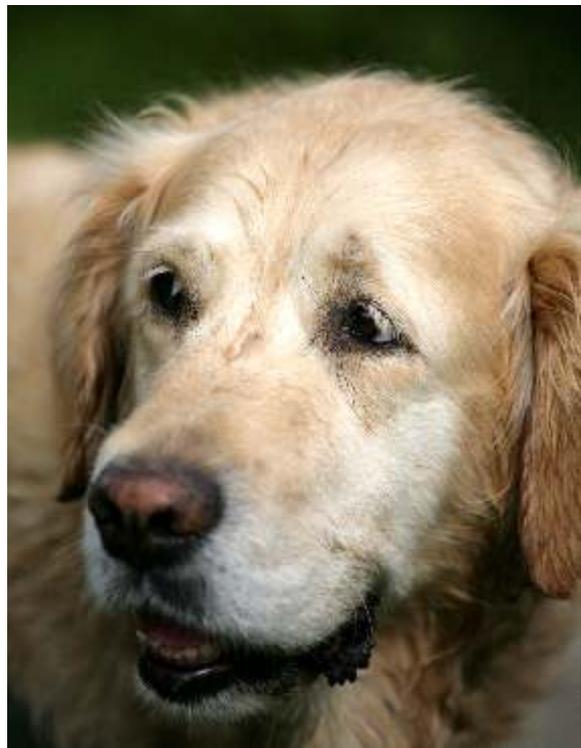
Drugs that improve the body's ability to reduce salt and water retention, to reduce high blood pressure, and to limit the effect of hormones that adversely affect heart muscle.

- **Antiarrhythmic agents**

May be given to stabilize the cardiac rate and rhythm.

- **Drugs and nutritional supplements**

Drugs to decrease blood pressure and nutritional supplements may be required for specific conditions.





### **Controlling the symptoms of heart failure**

Low-salt (sodium) diets may be suggested. The kidney normally removes excess sodium, but this does not occur as effectively in heart failure. Commercial low-salt diets, varying from moderate to extreme restriction, are effective in preventing salt and water retention.

These diets are recommended only after heart failure has been diagnosed. A modest reduction in salt intake may be indicated before the onset of heart failure. If the pet refuses to eat a commercial diet, low-salt foods can be prepared by the owner under veterinary direction.

Mixing low-salt diets with regular (high-salt) diets or feeding snacks high in sodium is not recommended.

### **Prognosis**

Longevity and quality of life in dogs with this disease varies with the severity of the valve damage and the amount of blood leakage into the upper chambers of the heart.

Pre-existing medical conditions, age, and the physical status of the pet play a large role in determining the animal's prognosis. Clinical signs are progressive, and although they may be decreased, they never entirely resolve. Medical therapy can enhance the quality of life of the pet as well as increase life expectancy. Dogs with left-sided valvular heart disease treated with medication and a low-salt diet have an average life expectancy of about 9 months from the time heart failure begins.

Abdominal fluid accumulation and body emaciation are signs of right-sided heart failure. Regularly removing the extra fluid may increase life expectancy. Surgical replacement of the valves is not an option in dogs at this time.

If at anytime you are worried about your pet, please contact the practice immediately for advice.