

## Mitral Valve Disease in Dogs and Cats

Mark Rishniw, BVSc, PhD, DACVIM (SA-IM), DACVIM (CA)

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Myxomatous mitral valve disease (MMVD, also called chronic mitral valve disease, degenerative mitral valve disease, mitral insufficiency, and endocardiosis) is the most common cardiac condition seen in dogs. It is mostly, but not exclusively, a disease of smaller breed dogs, and is seen in middle-age or geriatric dogs. Rarely, it is seen in cats (we're not going to discuss cats any further in this article).

MMVD is caused by as-yet unidentified processes that lead to degeneration of the mitral valves, the valves on the left side of the heart between the left atrium and left ventricle. The degenerative process causes the valves to thicken and retract, creating a hole through which blood can flow back from the left ventricle into the left atrium when the left ventricle contracts. The mitral chordae tendinae (think of them as mooring lines for the valve) can tear, causing the valve to flop around rather than sealing off the left atrium from the left ventricle. If severe enough, this leak can cause left-sided congestive heart failure (CHF).

Approximately 10 percent of older small-breed dogs have MMVD. Some breeds are predisposed and get more progressive and earlier forms of MMVD. The breed most studied with MMVD is the Cavalier King Charles spaniel, mostly because it is popular (especially in Scandinavia) and because it develops MMVD at a relatively early age, often by four years old.

The good news is that although the disease is common, approximately 75 percent of dogs that develop MMVD will ultimately die of something else because the disease progresses slowly in many dogs. It's sort of like prostate cancer in old men: it's not the cancer that kills them, but other old-age causes. However, that still leaves plenty of older dogs in which the disease does become clinically important.

### Clinical Signs of MMVD

In most cases, MMVD is a surprise for the owner, detected by the veterinarian at a routine evaluation. As far as the owner is concerned, there was nothing wrong with the dog. And now they're being told there's a problem!

And that's true, most dogs with MMVD have no clinical signs, especially while the disease is mild. It is only when the disease progresses to the point of CHF that owners detect a problem.

Occasionally, when picking up the dog, an owner might feel the murmur associated with the leak on the left side of the chest. It feels like the dog is purring or vibrating!

Occasionally, dogs with MMVD can faint. In many cases, this is a sign of early CHF, or, less commonly, pulmonary hypertension. Sometimes, however, we can't find a cause for it. However, the good news is that this fainting is considered benign, or harmless, even if it does

look rather frightening. And it's often able to be controlled with corrective measures.

Once a dog develops CHF, clinical signs become obvious.

Dogs with MMVD that develop CHF can also develop pulmonary hypertension because of the valve disease. This is more common than was originally thought. If a dog develops severe pulmonary hypertension, the clinical signs become different – there can be fainting, shortness of breath, or even right-sided CHF. To an unsuspecting clinician, this can be confusing.

### Diagnosing MMVD

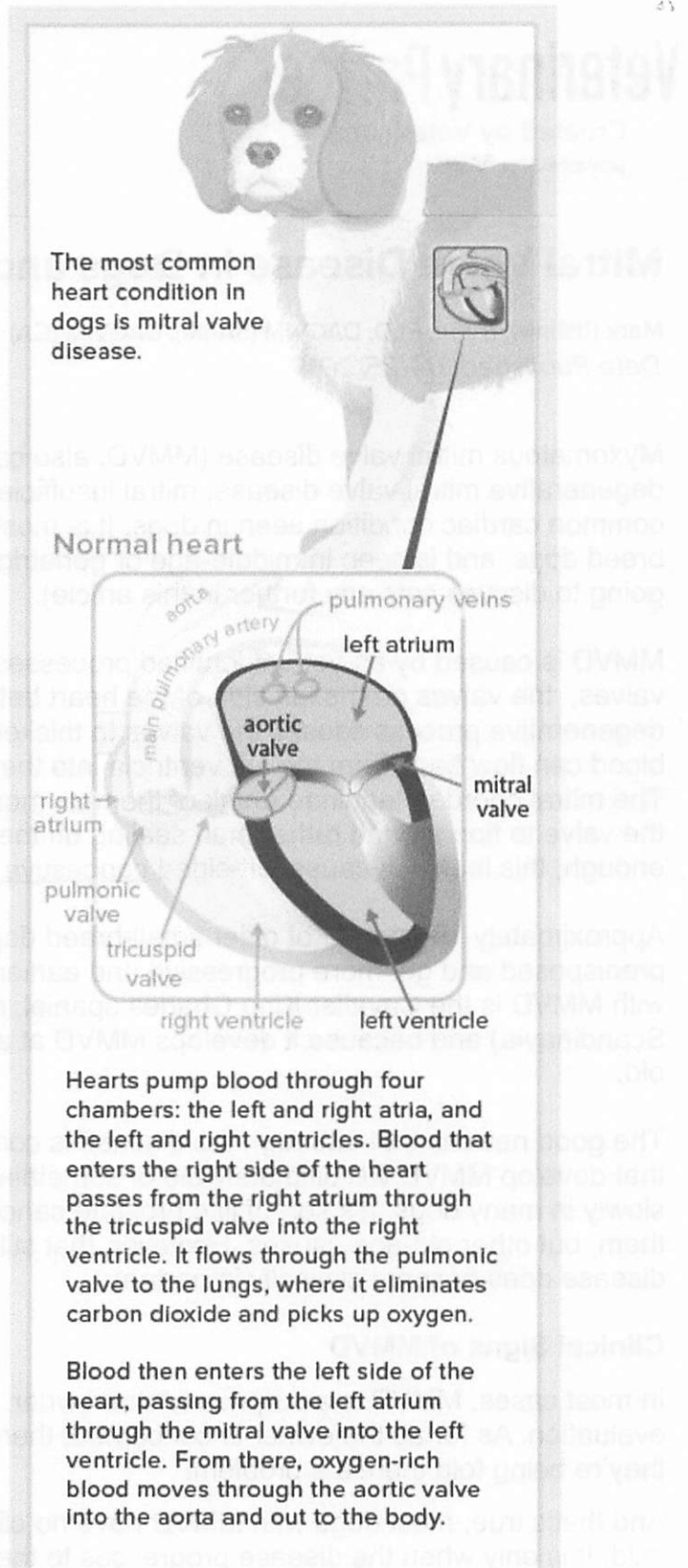
In most cases, a veterinarian will presumptively diagnose MMVD based on three things: 1) an older, 2) small-breed dog with a 3) characteristic left-sided murmur.

However, it is then worthwhile determining just how severe the MMVD is. This can often be done with chest X-rays to look at the size of the heart and evaluate the lungs. If a dog is suspected of having CHF, then chest X-rays are essential.

In some cases, especially if there is some doubt about the diagnosis, or it appears more complicated than usual, the veterinarian might recommend or perform an echocardiogram to better determine the disease process.

Severity of MMVD is determined by how much blood is leaking through the valve back into the left atrium. The bigger the leak, the bigger the heart, and specifically the left atrium, gets. Therefore, your veterinarian should be able to determine the severity of the disease by assessing left atrial size, either from the X-rays, or from the echocardiogram.

In general, mild MMVD has no visible changes on X-rays (or only minor changes), moderate MMVD has visible enlargement that is not “overwhelming” and severe MMVD has marked cardiomegaly (heart enlargement). This is important, because in most cases, CHF only sets in when the heart is massively enlarged (because the leak is really big). Occasionally, one of the valve's mooring lines (chordae



tendinae) can rupture, causing CHF without dramatic changes in heart size, but this is uncommon.

The echocardiogram is also useful in identifying pulmonary hypertension or ruptured chordae tendinae.

### Treatment of MMVD

Treatment of MMVD is directed at two phases: subclinical and CHF. Treatment during the subclinical phase is aimed at slowing down the progression of the disease to delay onset of CHF. Ideally, we would like to reverse the process, or "cure the valve," but that's not really possible. In humans with mitral valve disease, the valve is repaired or replaced. This is possible in dogs, but not commonly done (more later).

#### *Subclinical Treatment*

Several drugs have been investigated, or are currently being investigated as disease retardants – drugs that might slow the progression of the disease. These include angiotensin-converting enzyme inhibitors (ACE-inhibitors), pimobendan, and spironolactone. The only one of these that has clearly demonstrated the ability to prolong the time to CHF is pimobendan. Because many dogs with mild MMVD will never develop CHF, current recommendations are to begin pimobendan when the disease is reasonably apparent on chest X-rays (suggesting that the dog is more likely to ultimately develop CHF). Treating too early might simply be a waste of money.

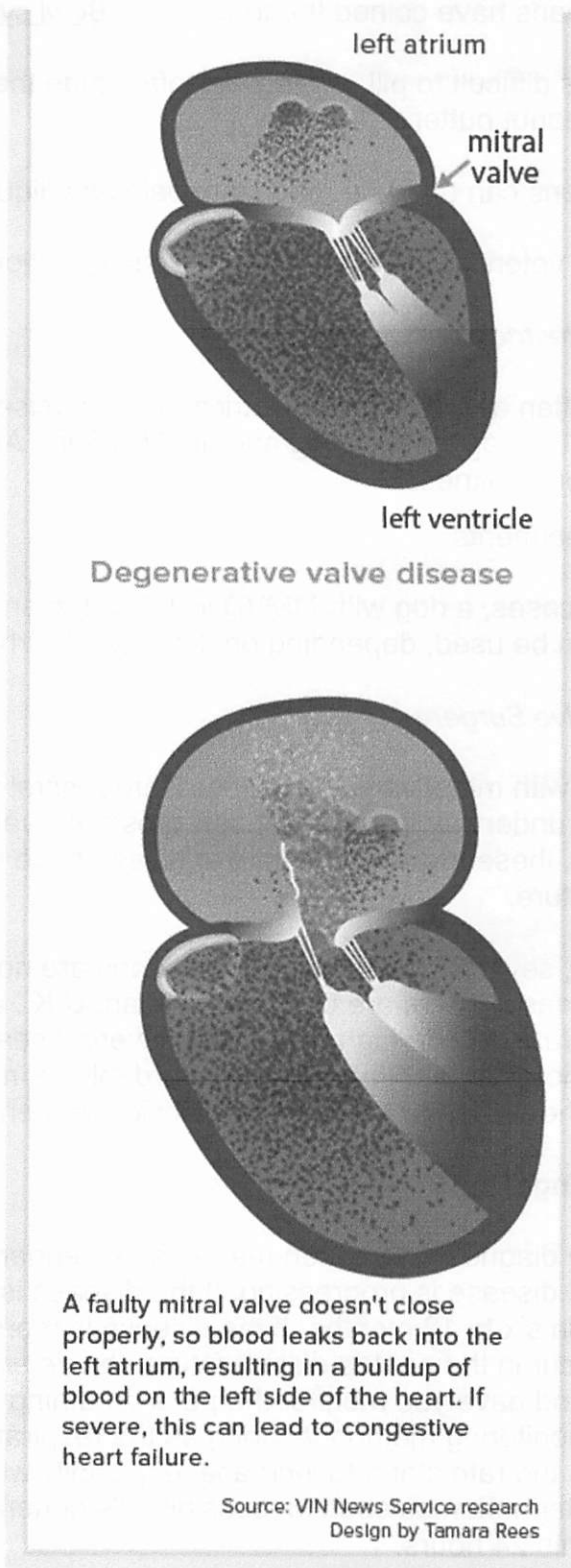
Many companies and veterinarians prescribe sodium-restricted diets, but no studies have demonstrated their value, especially in subclinical disease.

### Treatment of CHF

Find details of treating CHF in dogs with MMVD.

#### *Diets*

Avoiding high-salt treats is of particular importance in dogs with MMVD. Many small-breed dogs are spoiled with people food. However, things like cheese, deli-meats, chips, pretzels, etc. are really high in salt. These snacks can cause a dog that has been well managed with



A faulty mitral valve doesn't close properly, so blood leaks back into the left atrium, resulting in a buildup of blood on the left side of the heart. If severe, this can lead to congestive heart failure.

Source: VIN News Service research  
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drugs to develop CHF. Because of the propensity for exposure to these foods at parties, veterinarians have coined the term Super Bowl syndrome!

If a dog is difficult to pill, owners will often hide the pills in food. Pills can be hidden in no salt-added peanut butter.

Medications can often be made into palatable liquid formulas by a compounding pharmacy.

Ask your veterinarian if you need more suggestions.

### *Activity Restriction?*

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

### **Other Treatments**

In some cases, a dog with MMVD will develop an arrhythmia that requires treatment. Various drugs can be used, depending on the type of arrhythmia.

### *Mitral Valve Surgery*

Humans with mitral valve disease undergo mitral valve replacement or repair. Studies are currently underway in dogs to insert prosthetic valves, or reduce the size of the leak. However, these are experimental only, and have had lots of complications, but show promise for the future.

However, several cardiovascular surgeons are now doing valve repairs in dogs with mitral valve disease. There are centers in Japan, U.K., and France where this is being done. The success rate is quite high, even with severe disease. However, the cost of a repair approaches \$40,000, making it unaffordable for most dog owners. Interested people should contact the programs directly for specific requirements.

### **Monitoring MMVD**

Once the diagnosis has been made, the veterinarian might instruct you to monitor your pet to see if the disease is progressing. If the disease is mild, this might be simply to have a recheck in six to 12 months. If the disease is more advanced, and there is concern that CHF might occur in the not too distant future, the veterinarian might ask for more frequent re-checks and have you monitor the pet's breathing (respiratory rate). This is a cheap and simple monitoring method. As long as the respiratory rate is normal, things are OK. If, however, the rate starts to increase, especially while the pet is sleeping, then the pet should see a veterinarian as soon as possible: it's generally not an emergency, but the pet should be seen within 24 hours.

See how to measure the respiratory rate.

If the veterinarian diagnoses CHF, they might perform some bloodwork once treatment has been instituted to make sure that kidney function is not being overly compromised.

### **Prognosis**

Most dogs with mild MMVD never have a problem with their heart disease. However, those that develop CHF are destined to die from it. In most studies, 50 percent of dogs that develop CHF die within nine to 10 months. About 80 percent die before 18 months, and only a few manage to survive more than two years.

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