

Mitral Valve Disease and Technical considerations for the chronic cardiac patient

Many names, same disease

Degenerative mitral valve disease (DMVD)

Myxomatous mitral valve disease

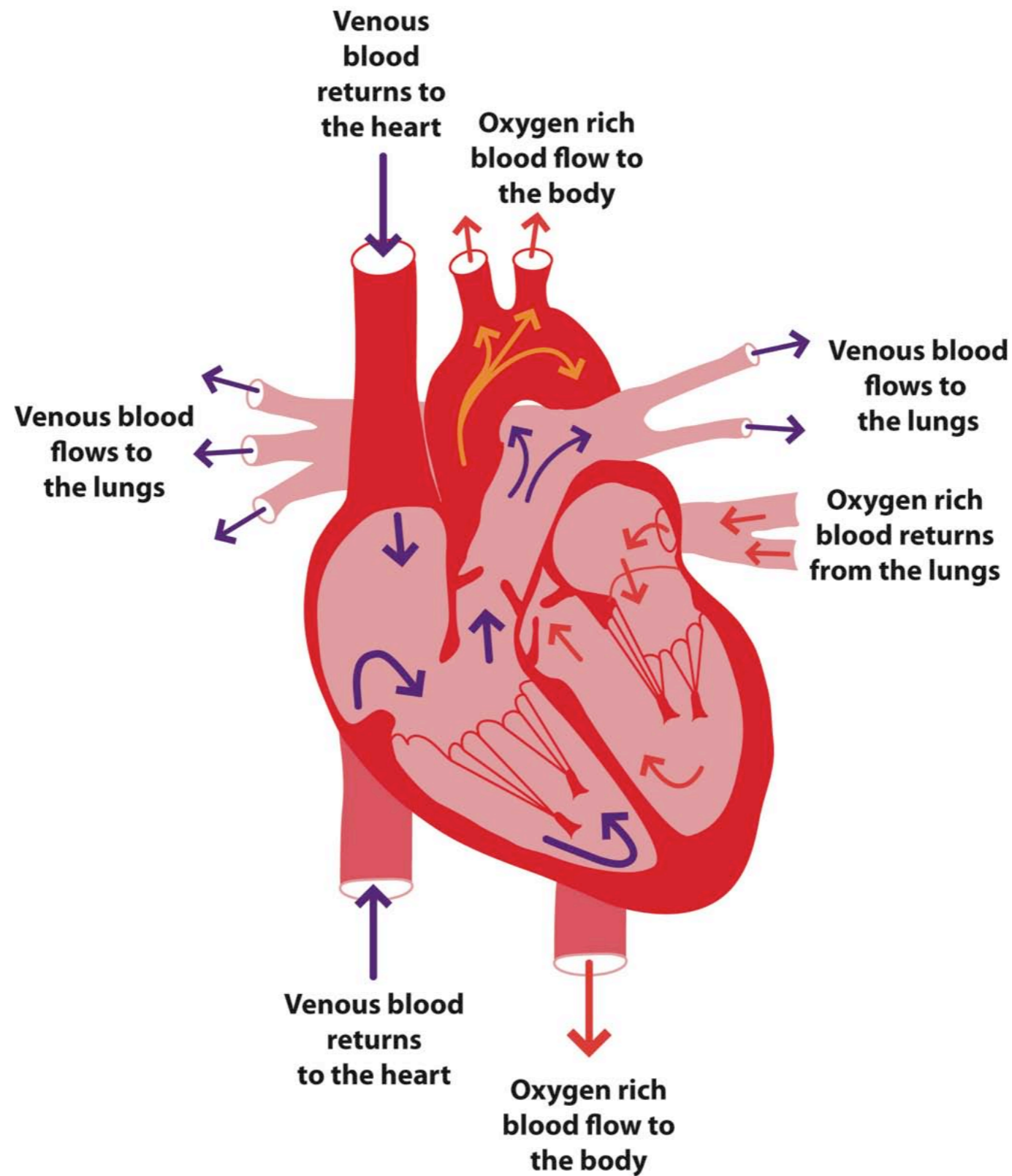
Chronic valvular disease

Valvular insufficiency

Mitral valve disease

Endocardiosis

Anatomy overview



Oxygenated blood flows from the lungs into the left atrium, passes through the mitral valve into the left ventricle where it is squeezed through the aorta in the systemic circulation

It then returns to heart into the right atrium through the tricuspid valve into the right ventricle and out to the lung

Systole - when the heart contracts and pushes the blood out of the chamber

Diastole - When the heart fills up with blood

A progressive disease of the connective tissue of the AV valves causing some or all of the following

- thickening of valve leaflets
- prolapse of valve leaflets
- LA and LV enlargement

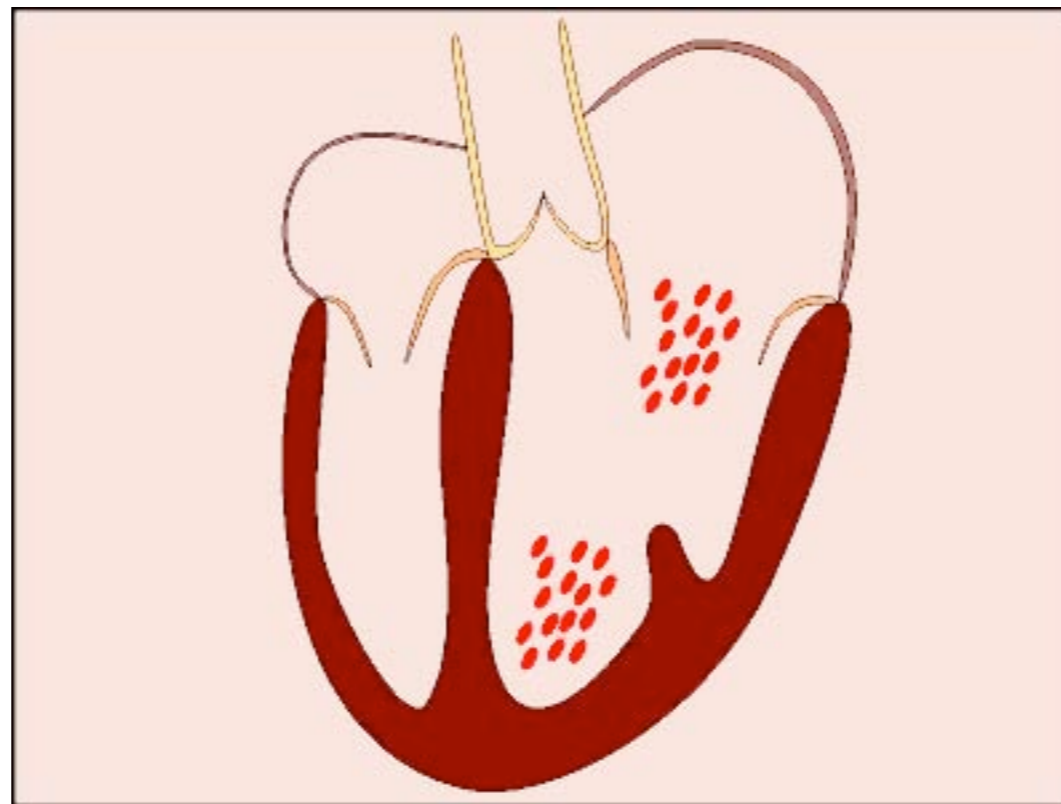
The disease may also include progressive lengthening and possible rupture of chordae tendonae.

- Myxomatous degeneration can affect any of the four valves.
- The mitral valve has the highest incidence of occurrence
- The second highest occurrence is a combination of the mitral and tricuspid valves
- The pulmonary and aortic valves are the least affected by degeneration

How does it happen?

Etiology is unknown

The disease is characterized by progressive thickening of valve leaflets with progressive loss of its mechanical properties leading to prolapse and regurgitation



Who is affected?

- Majority of dogs affected are small breed and most are over approximately 8 years of age (with some exceptions)
- Miniature and toy poodles, Miniature Schnauzers, Dachshunds, Bichons Frises, Pomeranians and Cavalier King Charles Spaniels
- 75% to 80% of dogs will acquire some type of valvular insufficiency making it the most common heart disease.
- **ALTHOUGH** it is not the most common cause of morbidity
- Humans have a similar condition called mitral valve prolapse syndrome

The most commonly affected
breed is...



Genetics and the early occurrence in CKCS

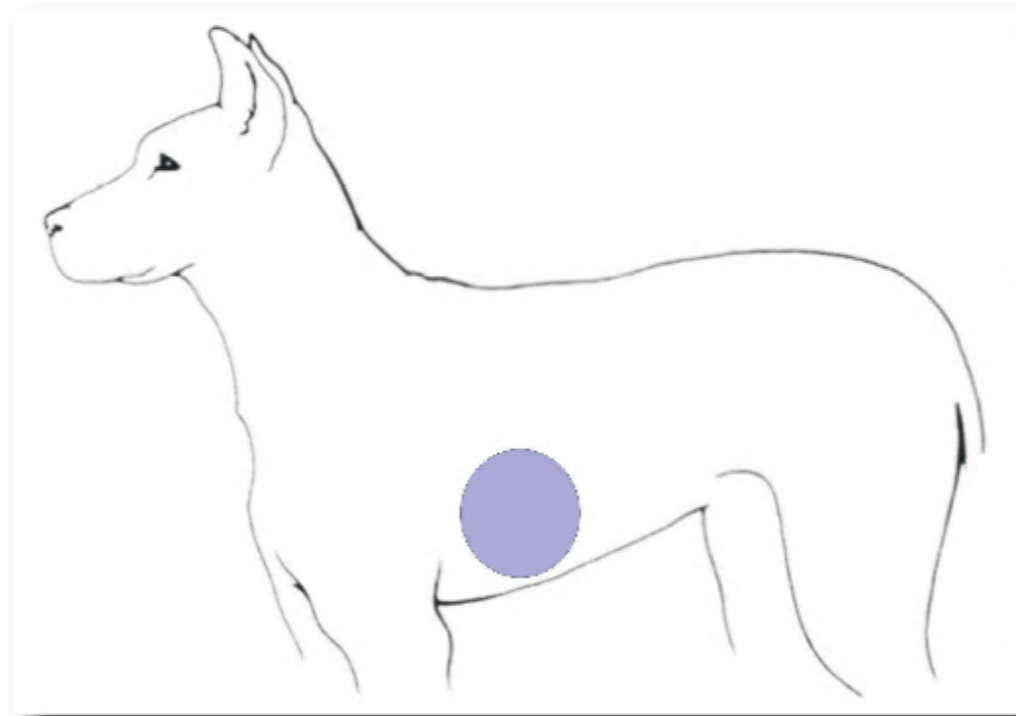
- 2 studies have been done on families of CKCS and Dachshunds
- It was found heredity is a major contributing factor in the transmission of DMVD
- Polygenic - multiple genes influence the trait
- There is a threshold which is to be reached before the disease develops

Genetics and the early occurrence in CKCS

- Parents diagnosed with early onset DMVD were more likely to produce offspring who also acquired early onset of the disease
- Parents with later onset DMVD produced litters with a higher incidence of late onset themselves
- Screening programs are essential in early detection and eventually reducing the numbers of early onset DMVD in CKCS.
- factors such as diet, exercise and obesity play such small role in the etiology that not much has been studied in regards to their influence on the disease

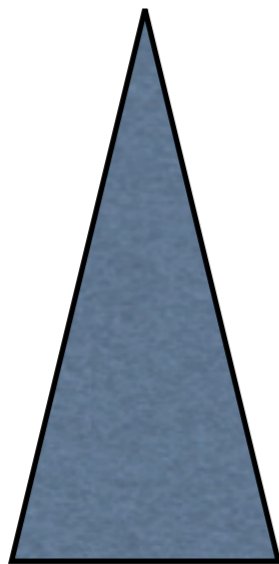
What's that sound?

- Auscultation of a soft heart murmur is one of the most common signs of DMVD in the early stages
- The murmur will be heard best over the mitral area on the left side of the chest
- The murmur can have different variations and they are not all uniform in how they present



What's that sound?

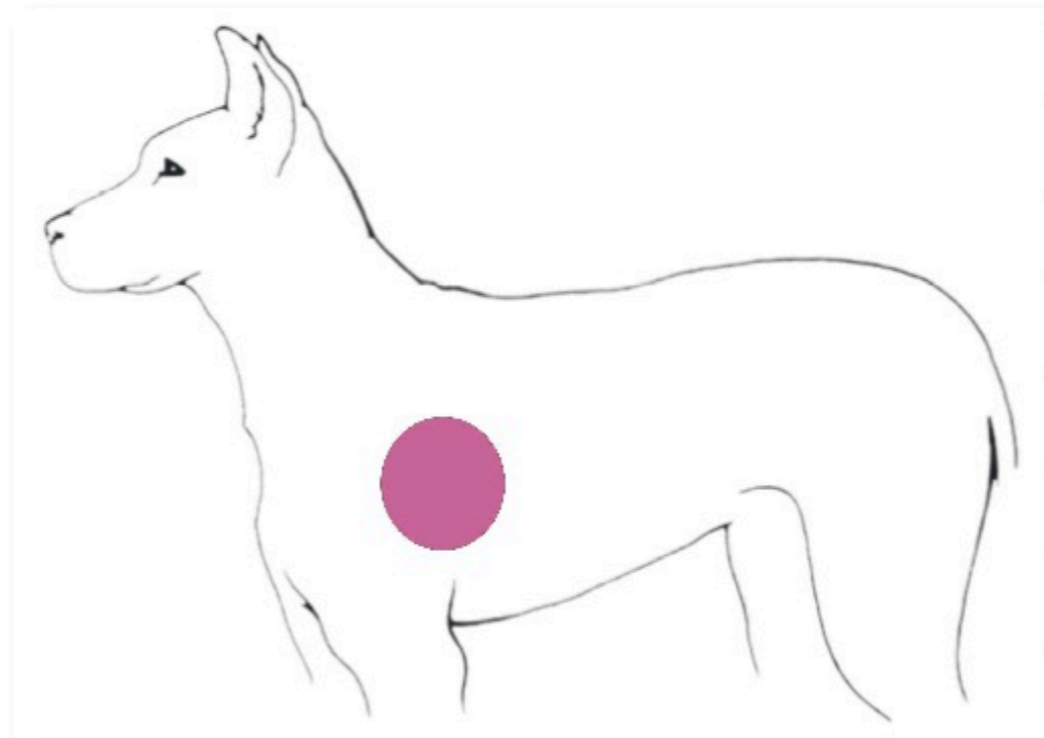
murmur progression



- just a mid systolic click, no murmur (third sound)
- a murmur with a mid systolic click
- intermittent
- being heard with every heart beat

Differential diagnosis

- Normal physiologic murmur - common in athletes (both in humans and animals)
- Note if a dog is stressed or has recently been exercised. Both factors affect the intensity of the murmur or produce a murmur in a dog in which one would not be present at rest.
- Congenital diseases such as a mild aortic or pulmonic stenosis - However these are left basilar murmurs!



Murmur diagnosis

Echocardiography

- Pros
 - Provides the best information on valve morphology and function.
 - It will rule out congenital disease, physiologic murmurs etc
- Cons
 - Requires a trained professional
 - more cost to the client than auscultation

As mitral valve disease progresses the risk of heart failure occurring also increases

Heart disease does not mean heart failure

You cannot have heart failure without heart disease present

ISACHC heart failure scale

(International Small Animal Cardiac Health Council)

- Class 1a - Asymptomatic with a murmur present and no heart enlargement
- Class 1b - Asymptomatic with a murmur present and heart enlargement
- Class 2 - Mild CHF, needs treatment, free from clinical signs at rest
- Class 3a - Severe CHF, clinical signs present at rest. Treatment at home is possible
- Class 3b - Severe CHF, clinical signs present at rest. Treatment in the ICU is necessary

The asymptomatic patient

Signs and Symptoms

No exercise intolerance or clinical signs

Murmur is present, loudest at the left apex

ECG - it is common to see a sinus arrhythmia

Chest rads will be unremarkable with a normal vertebral heart score (VHS)

Many asymptomatic patients will not progress to CHF

Treating the asymptomatic patient

At this time there are no treatment options which halt or reverse the progression of the disease

- Studies have shown pre treating an asymptomatic patient with an ace-inhibitor does not improve survival time
- Patients with a normal left atrium have a better prognosis
- if a patient has an increased LA/AO ratio they are at a higher risk of moving from a class 1 to class 2
- Once CHF occurs ACE inhibitors do improve the quality and quantity of life
- Early diagnosis is important not only in breeding programs. It allows the Veterinarian to optimize follow up by monitoring the LA/AO ratio and make the best options in terms of to treat or not to treat

The coughing patient

A cough alone is not considered a clinical sign for CHF

- The most important diagnostic tool in a coughing dog are chest radiographs
- Geriatric small breeds are prone to respiratory diseases such as collapsing tracheas, collapsing bronchi etc
- These diseases present with cough and chest radiographs are the only way to rule out respiratory vs cardiogenic disease.
- A sleeping respiratory rate is a very effective way to monitor for CHF

The symptomatic patient

Signs and symptoms

Increased respiratory rate and effort

Difficulty sleeping

Exercise intolerance

Weight loss

Decreased appetite

Chest radiographs show cardiomegaly and evidence of L-CHF

Treating the symptomatic patient

- Diuretics
- ACE inhibitor
- Pimobendan
- Spironolactone
- Amlodipine

The technicians role in the management of chronic heart disease

- A good history is the first initial step in management. Chronic cardiac cases require speaking with the clients on a regular basis so the initial exam is important in establishing a rapport with both pet and owner
- Consistency in how you perform the physical exam
- Client communication/follow up

Physical exam

- Start with respiratory rate before handling the patient
- If it's high take another rate at the end
- Note increased effort - inspiration or expiration
- flared nostrils
- wet sounds, crackles on auscultation
- Mucous membrane colour, CRT

Physical exam

Blood pressure

- Doppler is used the most; more accurate in patients with arrhythmia's and cats and small dogs.
- Series of 5 consecutive readings are taken. Highest and lowest are discounted and remaining three are averaged
- It is very important to note the limb and cuff size used
- Use the correct sized cuff!
 - Cats 30% to 40% of diameter
 - dogs 40% limb diameter

The Physical exam

Auscultation

- Start with the area you feel the heart beat. This area corresponds with the left apex = mitral area.
- Can you also feel a murmur?
- Heart rate - Tachycardia? Bradycardia?
- murmur present? Where does it sound the loudest? What does it sound like?
- Arrhythmia? Regular/irregular? Pulse deficits? Pulses strong/weak?
- Crackles?
- Gallop? This is heard better with use of the diaphragm function

Questions to ask during the exam

- Exercise intolerance or decreased energy level?
- Episodes or fainting or collapse?
- Coughing?
- Change in breathing pattern?
- Is the patient on any medications?
- Appetite?
- Increased drinking/urinating?

Client communication

The importance of follow up

- A regular log of resting or sleeping respiratory rates is THE most important information a client can provide
 - May be an indicator a patient is going into heart failure
 - May indicate the need to change the dosage of a diuretic
 - May prevent a visit to emergency



Questions?