Echocardiography: common views

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Echocardiography
Where does it fit in as a diagnostic tool?

- Echocardiography can give a more specific diagnosis than physical examination.
- Echocardiography gives more reliable information on chamber size compared to electrocardiography.
- Echocardiography allows better characterisation and quantification of cardiac disease than thoracic radiography.
Common echocardiography views

- Right parasternal long axis views
- Right parasternal short axis views
- Left sided 4/5 chamber views
Common echocardiography modes

- 2D
- M-mode
- Spectral Doppler
- Colour Doppler
This view allows assessment of:

- Mitral valve changes in mitral valve endocardiosis (MVE)
- LV wall thinning in dilated cardiomyopathy (DCM)
- LV wall thickening in aortic stenosis
- Chamber dilation in diseases such as DCM or MVE
- The inter atrial septum for evidence of atrial septal defects

LV = left ventricle, LA = left atrium, MV = mitral valve,
RV = right ventricle, RA = right atrium
Right parasternal long axis view - 2D

Optimised for mitral valve, left ventricle and left atrium

Mitral valve endocardiosis, showing thickened prolapsed mitral valve

Tricuspid valve dysplasia showing dilated right heart

Normal dog

LV = left ventricle, LA = left atrium, MV = mitral valve, RV = right ventricle, RA = right atrium

Image: Dr. Anne French
Right parasternal long axis view - 2D

This view allows assessment of:
- Aortic stenosis
- Aortic endocarditis
- Ventricular septal defects

LV = left ventricle, LA = left atrium, AV = aortic valve, Ao = aorta

Optimised for Left Ventricle outflow tract (LVOT)

Normal dog

Image: Dr. Anne French
**Right parasternal long axis view-colour Doppler**

**Red** – represents flow towards the probe

**Blue** – represents flow away from the probe

**Green** – represents turbulent blood flow

LV = left ventricle, LA = left atrium, MV = mitral valve

Mitral valve insufficiency – mitral valve endocardiosis

Image: Dr. Anne. French
Right parasternal short axis view
M Mode
At the level of the chordae tendinae

- The LV M-mode is obtained from the short axis view of the LV at the level of the chordae tendinae (image A).
- M-mode is used to make objective measurements of the LV and to measure contractility using fractional shortening.
- Measurements of the IVS, LV and LVW are made using the leading edge to leading edge technique. FS is calculated by the formula as shown below image B.

Fractional shortening (FS) = \frac{LV_{diastole} - LV_{systole}}{LV_{diastole}}

Image: Dr. Anne French
Right parasternal short axis view
M Mode

At the level of the chordae tendinae

Fractional shortening = 30%

Normal range of fractional shortening varies for breeds, usually 24-40%

Fractional shortening 5%

Image: Dr. Anne French
Right parasternal short axis view

At heart base optimised for aorta (Ao) and left atrium (LA)

Normal dog  LA:Ao =1.4

Dog with left atrial dilation due to mitral valve endocardiosis.
LA:Ao=2.8

Normal ratio of left atrium to aorta is less than or equal to 1.5

Image: Dr. Anne French
Right parasternal short axis view

This view is excellent to:

- Visualise the pulmonary arteries
- To provide good alignment for spectral and colour flow Doppler across the valves
- It helps to diagnose valvular pulmonic stenosis

Ao = aorta  PA = pulmonary artery
LA = left atrium PV = pulmonic valve

At heart base optimised for pulmonary artery

Normal dog

Image: Dr. Anne French
Right parasternal short axis view

At heart base optimised for pulmonary artery

Ao = aorta  LA = left atrium  PV = pulmonic valve
PA = pulmonary artery

Pulmonic valve
Post valvular dilation

Image: Dr. Anne French
This view is used:

- To subjectively assess the mitral valve, tricuspid valve, left ventricle, right ventricle, left atrium and right atrium
- To provide good alignment for Doppler flow across the mitral valve and tricuspid valve
Left sided apical five chamber view

This view is used:

- To subjectively assess the aortic valves
- To provide good alignment for Doppler flow across the aortic valve

- Increased velocity of flow across the aortic valves is suggestive of aortic stenosis
- Normal velocity of flow across the aortic valve is < 1.7 m/s

Normal dog

Image: Dr. Anne French
**Left sided apical five chamber view**

- Normal aortic valve

- Aortic sub-valvular ridge

- Turbulent blood flow at level of subvalvular ridge

**Abbreviations:**

MV = mitral valve  
RV = right ventricle  
LA = left atrium  
Ao = aorta

*Image: Dr. Anne French*